TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ

TAOMS 41.YIL

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ

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33. ULUSLARARASI BİLİMSEL KONGRESİ

Kongre Başkanı: Prof. Dr. Sabri Cemil İşler

TAOMS'26

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Grand Cevahir Hotel

İSTANBUL

TAM METİN ÖZETLERİ

İÇİNDEKİLER

KURULLAR

ULUSLARARASI KONUŞMACILAR

ULUSAL KONUŞMACILAR

BİLİMSEL PROGRAM

TAM METİN SÖZLÜ BİLDİRİLER

TAM METİN POSTER BİLDİRİLER

KURULLAR

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Selin Gaş

ULUSLARARASI KONUŞMACILAR

Manlio Galie

CV

Manlio Galiè is clinical Professor at the St. Anna University Hospital of Ferrara, Head of the Department of Cranio Maxillo Facial Surgery. He has completed formal training in both Medicine MD and Dentistry DMD. He specializes in Maxillo-Facial Surgery and in ENT Surgery. Dr. Galiè has lectured as invited speaker to numerous Seminars, Meetings, Roundtables and Congresses in Italy, Europe, and Worldwide. Author of over 70 publications in National and International Journals he is a Member of the Editorial Board of the Journal of Cranio-Maxillofacial Surgery (O_cial Pubblication of the European Association for Cranio-Maxillofacial Surgery – EACMFS), of the Journal of Craniomaxillofacial Trauma and Reconstruction (O_cial Membership Journal of AO CMF) and Se International Fellow at University of California, Los Angeles (UCLA), Craniofacial Center. Fellow of the European Board of Oro – Maxillo – Facial Surgery (FEBOMS) Honorary Fellow of the American Association of Oral and Maxillofacial Surgeons (FAAOMS) Past Education & Training O_cer of the European Association for Cranio-Maxillo-Facial Surgery (EACMFS) 2014-2020 Past President of the European Association for Cranio-Maxillo-Facial Surgery (EA Member of the European Clinical Networks: EUROCRAN and ORPHANET. Member of the following Associations: EACMFS (European Association for Cranio-Maxillofacial Surgery), SILPS (Society for Cleft Lip and Palate and Craniofacial Malformation Study and Treatment), SICMFS (Italian Soci Interested in new innovations in cranio-maxillo-facial surgery his special interests are in craniofacial surgery, orbital surgery, reconstructive surgery and total facial rehabilitation, orthognathic surgery, cleft surgery, tumor surg

Max Heiland

CV

Prof. Dr. med. dent. Max Heiland is a highly experienced oral and maxillofacial surgeon with a career spanning 26 years. He works at the Department of Oral and Maxillofacial Surgery at the University Hospital Charite Berlin. Dr. Heiland's impressive CV showcases his extensive education and qualifications. He completed his pre-clinical medical studies at the Johannes Gutenberg University in Mainz and clinical medical studies at the University of Hamburg. He went on to earn medical and dental doctorates, as well as a specialist title in oral and maxillofacial surgery. Additionally, he is a Fellow of the European Board of Oro-Maxillo-Facial Surgery. With over 400 scientific publications, Dr. Heiland is actively involved in research and advancing his field. His publications cover a wide range of topics, including using antibiotics in immunotherapy for head and neck carcinoma, the development of biomaterials for bone substitutes, and the application of deep learning algorithms in dental radiographs. Dr. Heiland's expertise and dedication to his profession make him a highly respected and sought-after oral and maxillofacial surgeon. He is known for his innovative approaches and contributions to the field. Patients can trust his vast knowledge and experience to deliver exceptional care and the best possible outcomes for their oral and maxillofacial surgical needs.

Raymond Wong

CV

Raymond Wong is a tenured Associate Professor in the Department of Oral and Maxillofacial Surgery at the National University of Singapore (NUS) Faculty of Dentistry. He also serves as **Vice Dean for Graduate Education and Lifelong Learning** and **Director of the Oral and Maxillofacial Surgery Residency Programme**. Clinically, he is the **Cluster Lead for Maxillofacial Surgery** and a **Senior Consultant** within the National University Health System (NUHS).

He graduated from the **Faculty of Dentistry, University of Malaya** in 1997, receiving an entrance scholarship as well as awards for outstanding performance in both the basic science and clinical examinations. He subsequently completed his **Master of Dental Surgery (MDS) in Oral and Maxillofacial Surgery** at the **National University of Singapore** in 2003 under the **ASEAN Scholarship** programme.

From **2007 to 2008**, he was awarded the **Health Manpower Development Program (HMDP) Scholarship** by the Singapore Ministry of Health to pursue advanced training in orthognathic surgery in the United Kingdom. During this period, he served as a **Specialist Registrar in Trauma and Orthognathic Surgery** at **Sunderland Royal Hospital** and as a **Clinical Fellow in Cleft Lip and Palate and Orthognathic Surgery** at **Morriston Hospital, Swansea**.

In **2011**, he was awarded a **PhD in Medical Sciences** from **Radboud University**, the Netherlands. He joined the **National University Health System (NUHS)** in **2012** and the **National University of Singapore (NUS)** faculty in **2015**.

ULUSAL KONUŞMACILAR

BAHADIR KAN

CV

Prof. Dr. Bahadır Kan was born in **Eskişehir, Türkiye**, in **1982**. He graduated from the **Faculty of Dentistry, Hacettepe University**, in **2005** and joined the **Department of Oral and Maxillofacial Surgery** at the same institution as a **Research Assistant**. In **2011**, he completed his doctoral thesis entitled *"A Comparative Histomorphometric and Radiological Evaluation of the Effects of Low-Level Laser Therapy on Distraction Osteogenesis: An Experimental Study,"* earning both his **specialist qualification in Oral and Maxillofacial Surgery** and a **PhD**.

Following completion of his military service, he was appointed **Assistant Professor** in the **Department of Oral and Maxillofacial Surgery, Kocaeli University Faculty of Dentistry**, in **2012**. He was promoted to **Associate Professor** in **2017** and **Professor** in **2022**. In **2018**, after serving as **Head of the Department**, he left the university to establish his **private practice**.

He continued his academic career as a faculty member at **Biruni University** (2019–2021), **Istanbul Okan University** (2021–2025), and **Kocaeli Health and Technology University** (2025–2026).

Prof. Kan is a member of several national and international scientific organizations, including the **Turkish Association of Oral and Maxillofacial Surgery (TAOMS)**, the **Association of Oral and Maxillofacial Surgeons (AÇBID)**, the **Turkish Society for Laser Dentistry**, **AO Foundation (AO)**, the **Academy of Osseointegration (AO)**, and the **International Team for Implantology (ITI)**. He has authored numerous articles published in internationally indexed and nationally peer-reviewed scientific journals.

His research interests include **reconstruction of maxillomandibular defects**, **bone regeneration techniques**, **advanced dental implant surgery**, **orthognathic surgery**, and **oral soft tissue surgery**, encompassing both clinical and experimental research.

Prof. Dr. Bahadır Kan is **married and has two children**.

BEDRETTİN CEM ŞENER

CV

Prof. Dr. Bedrettin Cem Şener is a senior specialist in Oral and Maxillofacial Surgery with nearly 35 years of clinical and academic experience, focusing on the digital transformation of the specialty and precision in surgical practice. He graduated from the **Hacettepe University Faculty of Dentistry** in 1988 and completed his PhD and specialty training in the same institution in 1995. Appointed **Professor** in 2006, Dr. Şener served for many years as a faculty member at the **Marmara University Faculty of Dentistry**, where he also held the position of **Vice Dean** between 2008 and 2010.

Since 2013, Dr. Şener has continued his academic work at the **University of Toronto** while maintaining an active clinical practice. Throughout his career, he has served as a visiting professor at prestigious institutions including **Johannes Kepler University (Linz General Hospital, Austria)** and **Semmelweis University (Hungary)**. In recognition of his contributions to the field, he was awarded the **Honorary Medal of the Hungarian Association of Oral and Maxillofacial Surgeons**.

Academic Impact and Publications

Dr. Şener has established a strong international academic profile through his contributions to the scientific literature:

- **Total Citations:** Over 1,050 (according to Google Scholar)
- **h-index:** 18
- **Publications:** Author of chapters in three international surgical textbooks, nearly 60 peer-reviewed scientific articles, and more than 180 presentations at international scientific meetings.

Areas of Expertise and Research Interests

Dr. Şener's clinical and research interests focus primarily on **temporomandibular joint (TMJ) surgery**, **dental implantology**, and **advanced bone reconstruction**. More recently, his work has expanded to include **software security in surgical workflows** and the **reliability of artificial intelligence algorithms in surgical applications**. As a founding member of the **Turkish Dental Laser Association**, he also provides international consultancy and educational programs on the safe integration of emerging technologies into surgical practice.

ABSTRACT

The Digital Paradox in Oral and Maxillofacial Surgery: Software Security, Algorithmic Reliability, and Cyber Threat Analysis

The field of Oral and Maxillofacial Surgery (OMFS) is undergoing a profound transformation through the integration of three-dimensional planning software, navigation systems, and artificial intelligence (AI)-based diagnostic algorithms into contemporary clinical practice. While this technological evolution promises to maximize surgical precision and operational efficiency, it also introduces the concept of **"digital vulnerability."** This study aims to examine the critical balance between clinical convenience and emerging cyber-physical risks.

The digitalization of surgical workflows has made healthcare institutions primary targets for sophisticated cyberattacks, including ransomware and data breaches. These threats to data integrity not only compromise patient confidentiality but may also pose direct clinical risks through the manipulation of surgical planning data. Furthermore, the lack of transparency in AI-based decision-making processes (**the "black box" problem**) and potential biases within clinical datasets raise important concerns regarding system reliability and the boundaries of medical liability.

Conclusion:
OMFS specialists must develop strategic awareness of software security, cyber hygiene, and algorithmic validation, moving beyond the mere adoption of technological tools and focusing on their safe and reliable implementation. The surgery of the future will not be shaped solely by surgical expertise and technical skills, but also by a digital literacy that enables clinicians to critically evaluate the reliability and limitations of the algorithms they use.

BELİR ATALAY

CV

Prof. Dr. Belir Atalay was born in Zonguldak at 1976. He was completed his primary, secondary and high school education at TED Zonguldak College and than attended Istanbul University Faculty of Dentistry in 1994. In 1999, he started his PhD education in the Department of Oral & Maxillofacial Surgery at the same Faculty and presented his PhD thesis in 2006. He received the title of "Associate Professor" in December 2012 and "Professor" in 2021. He still continues his studies in the same department at IU Faculty of Dentistry. Prof. Dr. Belir Atalay has 24 international and 8 national articles within the scope of SCI and SCI-E. He wrote 2 international scienti c book chapters. There is 1 chapter in the National Cancer book. He is a referee in 2 international and 1 national journals. There are 17 national and 40 international congress and symposium participation, 23 conferences and 13 course presentations. He had surgery and clinical participation as an observer in the US Boston TUFTS University in 2006 and 2017 UIC Chicago Oral & Maxillofacial surgery chairs. He is one of the rst practicing surgeons in Turkey on zygomatic implants and ceramic implants. He is a member of Turkish Oral & Maxillofacial Surgery Association, ACBID, Turkish Oral Surgery Association and ITI. Prof. Dr. Belir Atalay is married and has 2 daughters.

BETÜL GEDİK TARHAN

CV

Dr. Betül Gedik Tarhan is currently conducting postdoctoral research at the Department of Oral and Maxillofacial Surgery, Istanbul University, and the Stem Cell Research Center at Chulalongkorn University. Her research focuses on dental implantology, regenerative surgery, tissue engineering, and stem cell-based therapies. Her work includes drug delivery systems, the biomechanics of zirconia implants, innovative approaches to the treatment of medication-related osteonecrosis of the jaw (MRONJ), and patient-specific implants for post-oncologic reconstructive surgery. She has participated in national and international research projects and has authored scientific articles published in reputable peer-reviewed journals, as well as numerous conference presentations.

CEM ÜNGÖR

CV

Professor Cem Üngör, DDS, PhD, was born in Trabzon, Türkiye, in 1981. After completing his primary, secondary, and high school education in Trabzon, he received his Doctor of Dental Surgery (DDS) degree from the Faculty of Dentistry at Istanbul University (1999–2004). He completed his specialty training in Oral and Maxillofacial Surgery at the Faculty of Dentistry, Ankara University, between 2006 and 2011. In 2011, he was appointed as a faculty member in the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Karadeniz Technical University, where he was promoted to Associate Professor in 2014 and to Full Professor in 2019. He currently serves as a Professor in the same department.

Professor Üngör's clinical and research interests include cleft lip and palate, orthognathic surgery, and alveolar reconstructive surgery. He has authored numerous national and international scientific publications. He is married and the father of two children.

ABSTRACT

Bioscaffold-Supported Alveolar Bone Reconstruction

Alveolar bone loss may occur due to various factors, including trauma, periodontal diseases, tumor resections, and tooth extractions, and may complicate dental implant placement and prosthetic rehabilitation. In recent years, tissue engineering approaches have gained significant importance in the management of such defects. Particularly, bioscaffold systems have shown promising outcomes in alveolar bone reconstruction by providing three-dimensional structures that support bone regeneration.

Bioscaffolds are composed of biocompatible and often biodegradable materials that promote cell adhesion, proliferation, and differentiation. When combined with osteogenic cells and growth factors, these structures stimulate bone formation and facilitate the development of new bone tissue within the defect area. Currently, various biomaterials, including collagen, hydroxyapatite, β-tricalcium phosphate, and polymer-based scaffolds, are frequently utilized in alveolar bone regeneration.

Bioscaffold-supported alveolar bone reconstruction has attracted attention as an alternative or complementary approach to conventional bone grafting techniques due to its potential to provide more controlled tissue regeneration and reduce donor site morbidity. However, ongoing research continues to investigate critical factors influencing clinical success, including material properties, vascularization, and biological integration.

CEYDA ÖZÇAKIR TOMRUK

CV

Dr. Özçakır Tomruk graduated from the Faculty of Dentistry at Istanbul University in 1998 and completed her PhD program in the Department of Oral and Maxillofacial Surgery at the same university in 2004. Between 2002 and 2003, she was an ITI scholarship recipient at the University of Bern, and from 2003 to 2005, she worked as a research fellow at the same institution. She was promoted to Associate Professor in 2012 and attained the title of Professor in 2017. She currently serves as a faculty member at the Faculty of Dentistry, Yeditepe University. Dr. Özçakır Tomruk is an ITI Fellow and serves as the Director of ITI Academic Study Club I.

EMRE BENLİDAYI

CV

Professor M. Emre Benlidayı, DDS, PhD, graduated from the Faculty of Dentistry at Çukurova University in 2001. He completed his PhD and specialty training in Oral and Maxillofacial Surgery at the same institution in 2008. In 2006, he visited the Department of Maxillofacial Surgery at King's College Hospital, London, and in 2014, the Department of Maxillofacial Surgery at Paracelsus Medical University, Salzburg, where he participated in clinical and academic activities.

Professor Benlidayı served as the course director of the **"Çukurova Orthognathic Surgery Days and Cadaver Course,"** which was organized for the first time in Türkiye in 2016 and again in 2018.

Between 2014 and 2017, he served as the Head of the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Çukurova University. In 2019, he was elected as a board member of the Turkish Association of Oral and Maxillofacial Surgery.

He was promoted to Associate Professor in 2013 and attained the title of Professor in 2019. Professor Benlidayı has published more than 60 articles in national and international peer-reviewed journals and has presented over 100 posters and oral presentations at national and international scientific congresses. His publications have received more than 900 citations to date.

He has been involved in clinical and experimental research projects supported by **TÜBİTAK, Dentsply, ITI, TFI**, and the Scientific Research Projects Unit of Çukurova University.

Professor Benlidayı currently serves as a faculty member in the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Çukurova University. His main areas of interest include orthognathic surgery, advanced implant surgery, cleft lip and palate surgery, and hard tissue laboratory research.

EROL CANSIZ

CV

He was born in Istanbul in 1983. After he graduated from Marmara University Faculty of Dentistry (Istanbul) he nished his specialty training at Istanbul University Faculty of Dentistry (Istanbul), Oral and Maxillofacial Surgery Department and became a faculty member in the same department. In 2015 in order to improve his knowledge and experience on maxillofacial surgery he worked for six months in Istanbul University, Cerrahpasa Faculty of Medicine, Department of Otorhinolaryngology. Also he worked in Osnabruck, Germany, at Clinicum Osnabruck Department of Maxillofacial Surgery, and in London, England, at St.Georges Medical University Department of Maxillofacial Surgery. In 2022 he graduated from Bezmialem Foundation University, Faculty of Medicine and he had medical degree. In August 2019, he received the title of Associate Professor in Oral and Maxillofacial Surgery. Erol CANSIZ has been working in the Department of Oral and Maxillofacial Surgery of Istanbul University Faculty of Medicine since 2019 and with an additional task at the Department of Oral and Maxillofacial Surgery of Istanbul University Faculty of Dentistry, academically and clinically.

MEHMET EMRE YURTTUTAN

CV

Associate Professor Emre Yurttutan, DDS, PhD, received his Doctor of Dental Surgery (DDS) degree from the Faculty of Dentistry at Ankara University in 2008 and completed his PhD and specialty training in Oral and Maxillofacial Surgery at the same institution in 2014. He was promoted to Associate Professor in 2021 and currently serves in the Department of Oral and Maxillofacial Surgery at Ankara University.

His clinical and research interests include oral implantology, maxillofacial reconstruction, orthognathic surgery, oral pathology, and conservative and surgical treatment approaches for temporomandibular joint disorders.

ABSTRACT

Minimal Invasive Orthognathic Surgery: Techniques, Indications, and Limitations

In recent years, minimally invasive approaches in orthognathic surgery have gained increasing attention, aiming to reduce surgical trauma and accelerate the recovery process. These approaches are characterized by smaller incisions, limited tissue dissection, advanced instrumentation, and the integration of digital planning technologies. Particularly in fundamental procedures such as Le Fort I osteotomy and sagittal split ramus osteotomy, minimally invasive modifications may offer advantages in terms of patient comfort and reduced postoperative morbidity.

However, not every case is suitable for a minimally invasive approach. Limited surgical visualization, technical challenges, and restrictions in complication management require careful case selection and evaluation. This presentation will discuss the fundamental techniques, appropriate indications, and clinical limitations of minimally invasive orthognathic surgery based on current literature. The advantages and disadvantages of these approaches will also be evaluated in comparison with conventional surgical methods.

NURETTİN DİKER

CV

Associate Professor Nurettin Diker, DDS, PhD, graduated from the Faculty of Dentistry at Yeditepe University in 2013. After successfully passing the national Dental Specialty Examination held in the same year, he was accepted into the Oral and Maxillofacial Surgery residency program at the Faculty of Dentistry, Başkent University, where he completed his specialty training in 2017. In the same year, he completed his PhD in Neuroscience at Istanbul Medipol University by submitting his doctoral dissertation entitled *"Evaluation of the Regenerative Effects of Systemic Rifampicin Therapy Following Traumatic Inferior Alveolar Nerve Injury."*

He was appointed as an Assistant Professor in 2019 and promoted to Associate Professor in 2022. Between June 2022 and September 2022, he conducted research at São Paulo State University with a research grant from the **International Bone Research Association (IBRA)**. In April 2023, he participated in the Erasmus+ teaching mobility program at the University of Foggia, Italy. Between September 2025 and December 2025, he conducted research at Johannes Gutenberg University with an **ITI (International Team for Implantology)** scholarship.

Dr. Diker has published more than 20 articles in SCI and SCI-Expanded indexed journals and has presented numerous studies at national and international scientific congresses. He has also contributed as a book chapter author and translator. His research interests include peripheral nerve injuries, orthognathic surgery, and guided implant surgery.

ABSTRACT

Clinical Tips in Guided Implant Surgery

In contemporary dental implant therapy, treatment success is evaluated by the prevention of long-term complications and the achievement of optimal esthetic and functional outcomes. For this purpose, prioritizing prosthetically driven planning has gained increasing popularity in implant placement procedures.

Computed tomography (CBCT) data and intraoral scanning records obtained from the patient are transferred into a digital environment, where the ideal prosthetic restoration is designed first. Subsequently, the most appropriate implant positions and angulations are determined according to this prosthetic design. The digitally planned implant positions can then be accurately transferred to the clinical setting using surgical guides that are designed and fabricated accordingly.

Modifications in surgical guide design allow the creation of customized flap designs according to the surgical requirements. Therefore, the need for bone augmentation procedures or additional surgical interventions in the relevant region does not necessarily represent a contraindication for guided implant surgery.

In patients requiring simultaneous alveoloplasty or multiple tooth extractions, the use of stackable guides can improve the accuracy of implant positioning. Furthermore, the registration protocols and surgical guide designs for completely edentulous patients involve specific considerations and differ from those used in dentate patients.

OLCAY SAKAR

CV

Professor Olcay Şakar, DDS, PhD, graduated from the Faculty of Dentistry at Istanbul University in 1987. He received the title of **Dr. Med. Dent.** in 1995 from the Department of Prosthodontics at the same university after completing his doctoral thesis entitled *"Factors Contributing to Achieving Successful Esthetics in Complete and Removable Partial Dentures."*

Professor Şakar was promoted to Associate Professor in 2000 and attained the title of Professor in 2007. He has published more than 50 scientific articles in national and international journals. He is the editor and author of eight chapters of the book *"Removable Partial Dentures: A Practitioners' Manual."*

He has served as the President of the Istanbul Chamber of Dentists, the Prosthodontics Academy, and the Gnathology Association. He is also a member of the Turkish Prosthodontics and Implantology Association and the Academy of Esthetic Dentistry.

ABSTRACT

Oromandibular Dystonia: Why Should Dentists Be Aware?

Oromandibular dystonia (OMD) is a movement disorder characterized by persistent or repetitive, involuntary abnormal movements of the muscles of the face, jaw, and tongue. OMD can lead to functional and psychosocial impairment and may develop following dental treatment. It is frequently misdiagnosed as a dental condition.

Patients who have consulted multiple healthcare providers may present to dentists with complaints such as jaw or facial pain, mandibular subluxation, bruxism, fractured teeth or restorations, and other orofacial symptoms. OMD is an important diagnosis that should not be overlooked by dental professionals. However, because many clinicians are unfamiliar with this disorder, delayed diagnosis, inappropriate treatment, and subsequent complications may occur.

Treatment options for OMD include botulinum toxin injections, afferent muscle blockade, the use of oral appliances, pharmacological therapies, and neurological, psychiatric, and surgical approaches. Since OMD requires differential diagnosis from other movement disorders such as Parkinson's disease, it also needs to be distinguished from temporomandibular disorders and bruxism in dental practice.

In some patients, various voluntary actions known as **"sensory tricks"**—such as placing an object between the teeth or lips, chewing gum, or touching or applying pressure to the jaw, cheek, lips, teeth, or gingiva—may reduce or temporarily eliminate symptoms. **Dentist-designed sensory trick splints** mimic this clinical phenomenon and may contribute to improving patients' quality of life.

ÖZGÜR ERDOĞAN

CV

Professor Özgür Erdoğan, DDS, PhD, graduated from the Faculty of Dentistry at Hacettepe University in 2000 and completed his specialty training in Oral and Maxillofacial Surgery at the Faculty of Dentistry, Çukurova University, in 2007. Between 2005 and 2006, he worked as an **ITI Implant Scholar** at the University of Connecticut School of Dental Medicine, USA, and in 2009, he served as an **AO Craniomaxillofacial Trauma Fellow** at the University of Freiburg, Germany.

From 2009 to 2014, he served as a faculty member at the Faculty of Dentistry, Çukurova University. Between 2014 and 2016, he worked as an Associate Professor at the Faculty of Dentistry, Rangsit University, Thailand. Professor Erdoğan has authored more than 60 scientific publications in international peer-reviewed journals.

Since 2016, he has been serving as a faculty member in the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Istanbul Okan University, and was promoted to the title of Professor in 2018.

ABSTRACT

Clinical Challenges and Management Strategies in Digitally Guided Dental Implant Surgery

Digitally guided implant surgery is widely used today due to its potential to improve implant placement accuracy, reduce surgical time, and facilitate prosthetically driven treatment planning. However, during implant procedures involving static computer-assisted surgical guides, various technical and clinical challenges may be encountered throughout the planning, guide fabrication, and surgical application stages.

This presentation will address the most frequently encountered clinical problems in digitally guided implant surgery and the strategies used for their management. Particular attention will be given to potential errors during the registration of CBCT data and intraoral scanning data, surgical guide stability, sleeve tolerance, drill–guide interaction, and deviations between the planned and actual implant positions.

In addition, clinical challenges encountered in cases with limited mouth opening, implant placement in posterior regions, and completely edentulous patients will be discussed through real clinical examples.

SIDIKA SİNEM SOYDAN

CV

Professor Sıdıka Akdeniz, DDS, PhD, was born in the Turkish Republic of Northern Cyprus in 1985. She completed her undergraduate education at the Faculty of Dentistry, Hacettepe University, in 2007. In the same year, she started her doctoral training in the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Başkent University. In 2009, she continued her academic training at the University College London Hospital in London, UK, and completed her PhD in 2011 by successfully defending her doctoral dissertation.

In 2011, she joined the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Başkent University, as a lecturer. She was appointed Assistant Professor in 2012, promoted to Associate Professor in 2016, and attained the title of Professor in 2021. Since 2016, she has been a member of the organizing committee of the **Assistant School of the Association of Oral and Maxillofacial Surgery (ACBİD)**. Between 2021 and 2024, she served as the Head of the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Başkent University. In 2025, she founded **NUO Klinik Oral and Dental Health Polyclinic** in Ankara, where she currently continues her professional practice.

Her main areas of clinical interest and expertise include the diagnosis and treatment of temporomandibular joint disorders, rehabilitation of jawbone deficiencies, advanced dental implantology procedures, surgical treatment of jawbone pathologies, and the correction of jaw deformities through orthognathic surgery. She has presented numerous studies at national and international scientific congresses and has published extensively in scientific journals related to her clinical practice and research areas.

ABSTRACT

Treatment Strategies for Mandibular Asymmetry Associated with Condylar Hyperplasia

Mandibular condylar hyperplasia is a dynamic pathological condition associated with growth activity, characterized by progressive facial asymmetry, occlusal disturbances, and temporomandibular dysfunction. One of the most critical aspects in clinical practice is accurately determining whether the existing asymmetry represents merely a morphological deformity or an active biological process involving ongoing growth. Misdiagnosis or incomplete evaluation may result in inappropriate treatment timing, unnecessary orthognathic surgery, or recurrence.

Accurate diagnosis requires a comprehensive assessment including detailed clinical examination, serial photographic and model analyses, cone-beam computed tomography (CBCT) evaluation, and particularly scintigraphic studies for the detection of active growth. In the presence of active condylar growth, orthognathic approaches alone may be insufficient, as asymmetry may continue to progress unless the underlying growth center is controlled.

In this context, condylectomy represents an effective treatment option, particularly for patients in the active phase, by surgically eliminating the pathological growth center. High and low condylectomy techniques provide significant advantages in controlling growth, maintaining occlusal stability, and preventing the progression of deformity. When combined with appropriate patient selection and optimal timing, condylectomy becomes a fundamental step that enhances the success of orthodontic and orthognathic treatment.

This presentation will discuss the pathophysiology of mandibular condylar hyperplasia, diagnostic algorithms, and indications for condylectomy based on current literature. The impact of accurate diagnosis on treatment success and clinical decision-making processes will also be evaluated.

TAMER TÜZÜNER

CV

Professor Tamer Tüzüner, DDS, PhD, was born in Trabzon, Türkiye, on August 23, 1979. He completed his dental education at the Faculty of Dentistry, Gazi University, where he enrolled in 1997 and graduated in 2002. In the same year, he started his PhD and specialty training in the Department of Pediatric Dentistry at Gazi University and completed his doctoral education in 2008.

In 2009, he joined the Department of Pediatric Dentistry at the Faculty of Dentistry, Karadeniz Technical University, as an Assistant Professor. He was promoted to Associate Professor in 2013 and attained the title of Professor in 2019. He currently serves as the Head of the Department of Pediatric Dentistry, a member of the Faculty Administrative Board, and the Chair of the Scientific Research Ethics Committee at the Faculty of Dentistry, Karadeniz Technical University. He also serves as a member of the University Senate.

Professor Tüzüner is a member of the **Turkish Society of Pediatric Dentistry**, the **Turkish Dental Association**, and the **European Academy of Paediatric Dentistry**. He has participated in Erasmus+ academic mobility programs and has authored approximately 100 scientific articles published in national and international journals, as well as nearly 100 scientific presentations at national and international congresses. He has contributed to numerous nationally funded research projects supported by TÜBİTAK, TÜSEB, KOSGEB, DOKA, and the Scientific Research Projects Unit (BAP), and he holds a national patent with a commercialized product. His Web of Science **h-index is 16**.

His main research interests include preventive dentistry, biomimetic dentistry, glass ionomer cements and antibacterial materials, atraumatic restorative treatment, minimally invasive dentistry, behavior management, digital dentistry, artificial intelligence applications, and biostatistics.

Professor Tamer Tüzüner is fluent in English, is married, and is the father of twin sons.

ABSTRACT

An Overview of Scientific Research Designs, Sampling, Randomization, and Bias Concepts

In this presentation titled **"An Overview of Scientific Research Designs, Sampling, Randomization, and Bias Concepts,"** the fundamental structural and methodological components of academic research will be addressed within a systematic framework.

Research designs will be examined in the context of observational studies (cohort, case-control, and cross-sectional studies) and experimental studies (randomized controlled trials), with discussions on the strengths and limitations of each design. In addition, evidence-based research principles will be comprehensively reviewed, with particular emphasis on the importance of systematic reviews and meta-analyses. The role of meta-analysis applications in contemporary research methodologies and their relationship with artificial intelligence-supported approaches will also be explored.

The presentation will address key concepts including data and measurement principles, sampling methods, sample selection processes, and determination of appropriate sample sizes. The role of randomization in experimental research, different randomization methods, and their contribution to the reliability of scientific studies will be summarized.

Finally, the concept of bias and its various types will be discussed, along with recommendations for improving research quality. The primary objectives of this presentation are to support sustainable improvement in research processes and to provide guidance for researchers in achieving more effective outcomes when transforming their scientific work into high-quality publications in the current academic environment.

ÜMİT ERTAŞ

CV

Prof. Dr. Umit Ertas graduated from Ataturk University Faculty of Dentistry in 1994.In 1999, he completed his doctorate in the Department of Oral and Maxillofacial Surgery at Ataturk University Faculty of Dentistry and received the title of “Dr.” He was entitled to receive the title of Professor in 2012 at the same university. He has numerous national and international scienti c articles and has been cited in international scienti c articles. He gives numerous national and international conferences, seminars and courses on topics such as maxillofacial surgery, orthognathic surgery, traumatology, cleft lip and palate and temporomandibular joint surgery.

YAVUZ TOLGA KORKMAZ

CV

Dr. Yavuz Tolga Korkmaz graduated from Gazi University Faculty of Dentistry in 2003 and PhD in 2010 at Gazi University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery. In 2011 he had started to Karadeniz Technical University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery and appointed to teaching sta as an Assistant Professor. Dr. Korkmaz had gained the title of Associate Professor in 2018. He appointed as a Professor in 2023. He is currently Chairman of the Department of Oral Maxillofacial Surgery at the same university. Dr. Korkmaz has many national and international research articles and book chapters in scienti c book and journals. Dr. Korkmaz is the member of Turkish Association of Oral and Maxillofacial Surgeons (TAOMS). Dr Korkmaz's areas of clinical and research interest are orthognatic surgery, temporomandibular jont disorders' clinical and surgical treatments, advanced dental implant surgery, dentoalveolar surgery and maxillofacial trauma.

YOUNG TAOMS SPEAKERS

HELİN MERVE ÖZALP

CV

EDUCATION

Bachelor of Dentistry:

Istanbul Okan University – Graduated with First Degree Honors (2020)

High School:

Gebze Anatolian Teacher Training High School (2015)

ACADEMIC / PROFESSIONAL EXPERIENCE

Research Assistant – Faculty of Dentistry, Karadeniz Technical University (2021–2025)

Specialist in Oral and Maxillofacial Surgery – Faculty of Dentistry, Karadeniz Technical University (2025–Present)

Foreign Language: English

FIELD OF SPECIALIZATION

Oral and Maxillofacial Surgery

THESIS TOPICS

Odontogenic Orofacial Infections and Treatment Approaches

(Undergraduate Thesis)

Clinical and Radiographic Evaluation of the Long-Term Success of Implants Placed in Combination with Various Maxillary Sinus Lift Techniques: A Retrospective Study

(Specialty Thesis)

PRESENTATIONS AT NATIONAL AND INTERNATIONAL SCIENTIFIC MEETINGS

Poster Presentations

Özalp H, Korkmaz Y, Erdayandı G, Karslı N, Çakralı T.

Treatment of Obstructive Sleep Apnea Syndrome with Bimaxillary Orthognathic Surgery: A Case Report.

29th Congress of the Turkish Association of Oral and Maxillofacial Surgery, 6–10 November 2022, Antalya, Türkiye.

Özalp H, Korkmaz Y, Bölükbaşı M, Pala B.

Treatment of Severe Lateral Open Bite with Posterior Maxillary Segmental Distraction: A Case Report.

30th Congress of the Turkish Association of Oral and Maxillofacial Surgery, 17–21 November 2023, Antalya, Türkiye.

Özalp H, Korkmaz Y, Girgin F.

Successful Autotransplantation of a Wisdom Tooth in Place of a Missing Permanent Molar and Long-Term Follow-up: A Case Report.

17th International Congress of the Association of Oral and Maxillofacial Surgery, 10–14 May, Antalya, Türkiye.

Özalp H, Sivrikaya E.

Surgical Curettage Following Kenacort-A Application After Recurrence of Central Giant Cell Reparative Granuloma: A Case Report.

31st Congress of the Turkish Association of Oral and Maxillofacial Surgery, 9–13 October 2024, Bodrum, Türkiye.

Özalp H, Yılmaz O.

Reconstruction of Vertical Bone Deficiency in the Posterior Maxilla Using Patient-Specific Designed Titanium Mesh.

5–9 November 2025, Antalya, Türkiye.

Sakcı A, Özalp H, Turkan M, Yılmaz O.

Horizontal Bone Augmentation with Polycaprolactone: A Case Report.

5–9 November 2025, Antalya, Türkiye.

Özalp H, Girgin F, Sivrikaya E.

Surgical Resection and Reconstruction Plate Application Following Recurrence of Central Giant Cell Granuloma: A Case Report.

5–9 November 2025, Antalya, Türkiye.

Şahin G, Özalp H, Yılmaz O, Sivrikaya E.

Treatment of a Large Odontogenic Keratocyst: A Case Report.

5–9 November 2025, Antalya, Türkiye.

Cem Üngör, Helin Merve Özalp, Merve Nur Turkan.

Central Giant Cell Tumor of the Maxilla in a Child: A Case Report.

Oral Presentations

Özalp H, Korkmaz Y.

Graftless Maxillary Sinus Lift Procedures: Three Case Reports.

31st Congress of the Turkish Association of Oral and Maxillofacial Surgery, 9–13 October 2024, Bodrum, Türkiye.

Özalp H, Korkmaz Y.

Clinical and Radiographic Evaluation of the Long-Term Success of Implants Placed in Combination with Various Maxillary Sinus Lift Techniques: A Retrospective Study.

5–9 November 2025, Antalya, Türkiye.

Bayraktar A, Özalp H, Üngör C.

Clinical Evaluation of Different Arthrocentesis Techniques Applied in the Treatment of Temporomandibular Joint Disorders: A Retrospective Study.

5–9 November 2025, Antalya, Türkiye.

BOOK CHAPTERS

Özalp H, Girgin F.

Diagnosis and Treatment Methods of Medication-Related Osteonecrosis of the Jaw.

In: Laçin N (Ed.). Research and Evaluations in Oral and Maxillofacial Surgery. Ankara: Gece Kitaplığı; 2026. pp. 91–114.

Özalp H.

Condylar Hyperplasia: Clinical, Diagnostic, and Therapeutic Approaches.

In: Laçin N (Ed.). Research and Evaluations in Oral and Maxillofacial Surgery. Ankara: Gece Kitaplığı; 2026. pp. 115–127.

BOOK

Özalp H, Yalçın Ülker GM.

Odontogenic Orofacial Infections and Treatment Approaches.

Ankara: Iksad Publishing House; 2022.

ISBN: 978-625-8213-01-0.

AWARDS

Özalp H, Korkmaz Y, Bölükbaşı M, Pala B.

Treatment of Severe Lateral Open Bite with Posterior Maxillary Segmental Distraction: A Case Report.

30th Congress of the Turkish Association of Oral and Maxillofacial Surgery, 17–21 November 2023, Antalya, Türkiye.

(First Prize – Poster Presentation Award)

Bayraktar A, Özalp H, Üngör C.

Clinical Evaluation of Different Arthrocentesis Techniques Applied in the Treatment of Temporomandibular Joint Disorders: A Retrospective Study.

5–9 November 2025, Antalya, Türkiye.

(Third Prize – Oral Presentation Award)

ABSTRACT

The Most Innovative Solution I Developed for Managing a Complication

Introduction:
Archwise Alveolar Distraction Osteogenesis (AWDA) has emerged as one of the promising techniques for the reconstruction of alveolar clefts associated with cleft lip and palate. This vector-controlled approach enables the formation of new bone and attached gingiva in harmony with the alveolar ridge. However, despite its advantages, failures and complications may rarely occur. This case report aims to present the multidisciplinary management of inadequate distraction that developed during the treatment of a wide alveolar defect using the AWDA technique and to share the clinical outcomes achieved.

Case Report:
A 16-year-old systemically healthy patient was referred to the Department of Oral and Maxillofacial Surgery at Karadeniz Technical University due to esthetic, functional, and dental concerns. Clinical and radiographic examinations revealed the presence of bilateral alveolar clefts. The patient was referred to the Department of Orthodontics at Karadeniz Technical University for orthodontic treatment planning to achieve an appropriate alveolar arch form.

Following a multidisciplinary evaluation by the Departments of Oral and Maxillofacial Surgery and Orthodontics, alveolar segment transport using an intraoral distraction device based on the AWDA technique was planned to achieve an appropriate alveolar arch form and reconstruct the existing alveolar cleft. Under general anesthesia, osteotomies were performed in the relevant regions to create the transport alveolar segment, and activation of the distraction device was verified.

However, following completion of the latency period, the desired movement of the transport segment could not be achieved during device activation. To overcome this complication, a novel distraction device was designed based on the principles of the AWDA technique. Following the application and activation of the newly designed device, successful advancement of the transport segment was achieved. Consequently, the width of the alveolar cleft was reduced, and the bone and soft tissue conditions required for the planned alveolar bone grafting procedure were optimized.

Conclusion:
This case demonstrates that inadequate alveolar distraction occurring during the AWDA technique can be successfully managed through a multidisciplinary approach and appropriate technical modifications. The newly designed distraction device enabled controlled advancement of the transport segment after the complication occurred. This case presents an innovative approach suggesting that distraction systems customized according to individual patient requirements may provide an effective alternative for the management of extensive alveolar clefts.

SENEM AŞKIN EKİNCİ

CV

EDUCATION

Specialty Training:

Marmara University Faculty of Dentistry

Department of Oral and Maxillofacial Surgery (2018–2023)

Undergraduate Education:

Istanbul University Faculty of Dentistry (2012–2017)

High School:

Kırklareli Science High School (2008–2012)

Foreign Language: English – Advanced

PROFESSIONAL EXPERIENCE

Department of Oral and Maxillofacial Surgery, Marmara University Faculty of Dentistry (2018–2024)

Private Dental Clinic (2024–Present)

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Arbeitsgemeinschaft für Osteosynthesefragen Cranio Maxillofacial Surgeons (AOCMFS)

PUBLICATIONS IN INTERNATIONAL PEER-REVIEWED JOURNALS

SCI-Expanded Indexed Journals

Askin Ekinci S, Fettahzade S, Gocmen G, Bayram F, Ozkan Y.

Virtual bone-implant contact surface effect on implant stability in fresh extraction and healed sites: A pilot randomized clinical trial.

Scientific Reports. 2026 Apr 13.

Askin Ekinci S, Kiristioglu ZB, Ates O, Gocmen G.

Traditional vs. orthodontic extraction of impacted teeth related to the inferior alveolar nerve: A randomized controlled trial.

BMC Oral Health. 2025 Jul 2;25(1):1036.

Bayram F, Askin Ekinci S, Gocmen G.

Retrospective analysis of ideal needle puncture angles and depths for temporomandibular joint arthrocentesis using CBCT data.

Head & Face Medicine. 2024 Aug 28;20(1):43.

Askin Ekinci S, Bayram F, Gocmen G.

Spontaneous regeneration of bone following mandibular ramus bone harvesting: A CBCT analysis.

International Journal of Oral and Maxillofacial Surgery. 2024 Oct;53(10):853–859.

ESCI Indexed Journals

Bayram F, Askin Ekinci S, Göçmen G.

Evaluation of Water Displacement Method in Estimating Mandibular Ramus Autograft Volume.

European Journal of Therapeutics. 2024;30(5):706–713.

Erdem NF, Abdioğlu G, Ekinci SA, Şişman AÇ.

Radiological Evaluation and Biomechanical Stability of Implants Simultaneously Placed at the Sites with Sole Advanced Platelet-Rich Fibrin (A-PRF) Grafted Sinus Floor.

Journal of Maxillofacial and Oral Surgery. 2023 Dec;22(4):1083–1090.

PUBLICATIONS IN NATIONAL PEER-REVIEWED JOURNALS

Askin Ekinci S, Kucuk C, Gocmen G.

Delayed versus simultaneous implant placement with ramus block grafts: A retrospective cohort study.

Anatolian Clinic The Journal of Medical Sciences. 2024;29(3):318–328.

INTERNATIONAL ORAL PRESENTATIONS

Ozkan OF, Bayram F, Askin Ekinci S, Kaleci I, Fattahzade S, Ozkan Y.

Rehabilitation of Alveolar Clefts in Cleft Lip and Palate Patients Using the Archwise Alveolar Distraction Device (AWDA): A Case Series.

31st International Scientific Congress of the Turkish Association of Oral and Maxillofacial Surgery, 9–13 October 2024.

Askin Ekinci S, Kucuk C, Gocmen G.

Delayed versus simultaneous implant placement with ramus block grafts: A retrospective cohort study.

6th International Conference on Dentistry & Oral Health, 14–15 March 2024.

Askin Ekinci S, Kiristioglu ZB, Gocmen G.

An Alternative Method to Reduce Inferior Alveolar Nerve Injuries During Extraction of Deeply Impacted Teeth.

29th International Scientific Congress of the Turkish Association of Oral and Maxillofacial Surgery, 6–10 November 2022.

Berkel G, Bayram F, Askin Ekinci S.

Evaluation of Dentists' Perspectives on Sedation and General Anesthesia Applications.

1st International Turkish-Japanese Dental Congress & 2nd Ankara-Osaka University Dental Workshop, 24–26 June 2021.

Kıraç SB, Aşkın Ekinci S, Dergin G.

Horizontal Ridge Augmentation Using Modified Ridge Split Technique in a Patient Undergoing Orthognathic Surgery: A Case Report.

AÇBİD 14th International Online Congress, 7–9 May 2021.

POSTER PRESENTATIONS

Askin S, Ugurgelen FS, Olgac NV, Ugurlu F, Gonul O.

Unicystic Ameloblastoma Treated with a Minimally Invasive Approach in a Young Patient: A Case Report.

Marmara University 2nd International Dentistry Symposium (MUUDS), 29–30 April 2019.

Dinc UA, Kirac SB, Askin S, Atali O.

Peripheral Giant Cell Granuloma in the Anterior Maxilla: A Case Report.

Marmara University 2nd International Dentistry Symposium (MUUDS), 29–30 April 2019.

Deveci S, Borahan MO, Gumru Tarcin B, Erdem NF, Askin Ekinci S, Zenginkinet T.

Focal Epithelial Hyperplasia: A Rare Case Report with Three-Year Follow-Up.

26th International Congress of Esthetic Dentistry, Istanbul, Türkiye, 6 October 2022.

SUPPORTED RESEARCH PROJECTS

The Role of Parental Education in Improving Oral Health of Individuals Diagnosed with Mild Intellectual Disability

TÜBİTAK Project No: 125B083

4008 – Inclusive Society Practices Support Program for Individuals with Special Needs

Researchers: Karaaslan Ö, Bayram F, Göçmen G, Aşkın Ekinci S, Karaaslan D, Bilgin Göçmen G

Role: Project Coordinator

2025–Present

A Multidisciplinary Approach to Oral and Dental Health

TÜBİTAK 2237 – Project Training Activities Support Program

Coordinator: Bayram F

Researchers: Özkan Y, Ulucan K, Konrot AK, Aslan YU, Tozlu M, et al.

2023.

ABSTRACT

My Luckiest Case

Introduction

Extraction of primary teeth is one of the most frequently performed procedures in dentistry and is generally considered a routine intervention with a low risk of complications. This case report aims to present the diagnosis and multidisciplinary management process of a mandibular arteriovenous malformation (AVM) that was revealed by uncontrollable profuse bleeding following primary tooth extraction.

Case Report

A 9-year-old male patient was referred to the Faculty of Dentistry, Marmara University, with a complaint of facial swelling that persisted despite antibiotic therapy. Following clinical and radiographic evaluations, extraction of the associated primary tooth and decompression of a suspected odontogenic cyst were planned.

During the procedure performed under sedation, uncontrolled profuse bleeding occurred immediately after extraction of the primary tooth and could not be managed with local hemostatic measures. The patient was urgently transferred to the Faculty of Medicine, Marmara University. Further investigations resulted in the diagnosis of an arteriovenous malformation.

Under digital subtraction angiography guidance, embolization was performed involving the facial, lingual, and maxillary branches of the external carotid artery, as well as the inferior alveolar, masseteric, pterygoid, and buccal branches of the maxillary artery. The complication was successfully managed through a multidisciplinary approach involving the Departments of Oral and Maxillofacial Surgery, Anesthesiology and Reanimation, Interventional Radiology, and Otorhinolaryngology. No recurrence was observed during the six-year follow-up period.

Conclusion

This case demonstrates that even routine primary tooth extractions may represent the first clinical manifestation of rare but potentially life-threatening vascular pathologies. In cases of uncontrolled bleeding, early intervention and a multidisciplinary approach are crucial. This case can be considered a “lucky” case, as a potentially fatal complication was successfully managed through timely recognition and referral of the patient to an appropriate medical center.

Keywords: arteriovenous malformation, primary tooth extraction, profuse bleeding, embolization, multidisciplinary approach.

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ

33. ULUSLARARASI BİLİMSEL KONGRESİ

16-18 Haziran 2026, Grand Cevahir Hotel - İstanbul

BİLİMSEL PROGRAM

16 HAZİRAN 2026, SALI — SALON 1

08:00 - 09:00 Sözlü Bildiri Oturumları

EACMFS OTURUMU

Moderatörler: **Mustafa Sancar Ataç, Sırmahan Çakarer**

08:40 - 09:00 Majör Baş ve Boyun Rekonstrüktif Cerrahisinde Flep Seçimini Etkileyen Kriterler
Nick Kalavrezos

09:00 - 09:20 Solunum, Kimlik, Hacim ve Yüz Formu: Ortognatik Cerrahide Yeni Bir Paradigma
Manlio Galie

09:20 - 09:40 Arteriyovenöz Malformasyonlar: Multidisipliner Yaklaşım ile Cerrahi Arasında
Sylvie Testelin

09:40 - 10:00 Yüz Güzelliğinin Temel Unsurları
Christos Perisanidis

10:00 - 10:20 Kişiselleştirilmiş CMF Cerrahisi: Rekonstrüksiyonun Kurallarını Değiştirmek
Majeed Rana

10:20 - 10:40 BRONJ Tedavisinde Büyüme Faktörlerinden Zengin Plazmanın Kullanımı
Javier Gonzalez Lagunas

10:40 - 11:00 Orbital Travma: Cerrahi Yaklaşımın Genel Değerlendirmesi ve Nadir Olguların Yönetimi
Leo Vassiliou

11:00 - 11:10 Kahve Molası

Moderatörler: **Bahar Gürsoy, Erol Cansız**

11:10 - 11:30 Kafa Tabanı Komşuluğundaki Vasküler Lezyonlarda Endovasküler Tedavinin Yeri
Naci Koçer

11:30 - 11:50 Kombine Defektlerde 3D Kemik Ogmentasyonu: Videolar ile Cerrahi Yaklaşım
Erdem Kılıç

11:50 - 12:10 Ağız İçi Dikey Ramus Osteotomisi (IVRO): Uzun Vadeli Sonuçlar, Cerrahi İpuçları ve Ameliyat Sonrası Yönetim
Jun-Young Kim

12:10 -12:30 **Tartışma**

12:30 - 13:30 Öğle Yemeği

Moderatörler: **Ayşegül Tüzüner, Firdevs Şenel**

13:30 - 13:50 Kondil Travmalarında Eski ve Yeni Yaklaşımlar
Ümit Ertaş

AO CMF OTURUMU

13:50 - 14:10 Ortognatik Cerrahide Morbiditeyi Azaltmaya Yönelik Minimal İnvaziv Cerrahi Teknikler ve Perioperatif Yönetim
Max Heiland

14:10 - 14:30 Ortognatik Cerrahide Mandibula-Önce ve Maksilla-Önce Yaklaşımlar
Ignacio Garcia

14:30 - 14:45 Kahve Molası

IAOMS OTURUMU

Moderatörler**: Alper Sindel, Mehmet Ali Altay**

14:45 - 15:05 Şiddetli Kondiler Rezorpsiyonda Ortognatik Rekonstrüksiyon
Erol Cansız

15:05 - 15:25 Ortognatik Cerrahide Estetik Değerlendirmeler
Majeed Rana

15:25 - 15:45 Dentofasiyal ve Posttravmatik Deformite Düzeltiminde Cerrahi Planlama ve Değerlendirmeler
Raymond Wong

15:45 - 16:05 Kişiselleştirilmiş Yüz Feminizasyon Cerrahisi
Angela Rosa Caso

16:30 - 17:00 **AÇILIŞ TÖRENİ**

17:00 - 17:30 **PROF. DR. ÖZGÜR DEMİRTAŞ SÖYLEŞİ**

16 HAZİRAN 2026, SALI — SALON 2

Moderatörler: **Cemil İşler, Mehmet Ali Erdem**

11:10 - 11:30 Yumuşak Dokunun Estetik Yönetimi- Yüz Plastik Cerrahisinde Neler Yapıyoruz
Gürkan Kayabaşoğlu

11:30 - 11:50 Oral Kavite Tümör Cerrahisi Sonrası Rekonstrüksiyon
Alperen Vural

11:50 - 12:10 Fonksiyonel Endoskopik Sinüs Cerrahisi
Şenol Çomoğlu

12:10 -12:30 Temporomandibuler Eklem Hastalıklarında FTR Yaklaşımı
Demirhan Dıraçoğlu

12:30 - 13:30 Öğle Yemeği

Moderatörler: **Mehmet Emrah Polat, Barış Aydil**

13:30 - 13:50 Dudak Kanserinde Sentinel Nod Biyopsisinin Rolü
Mergime Prekazi Loxha

13:50 - 14:10 Dentomaksillofasiyal Anomalilerin Yönetimindeki Tartışmalar ve Uygulanan Protokolümüz
Ramazan Isufi

14:10 - 14:30 Mandibula Fraktürlerine Submandibular Yaklaşım
Cansu Koca

14:30 - 14:45 Kahve Molası

Moderatörler: **Hülya Koçak Berberoğlu, Banu Gürkan Köseoğlu**

14:45 - 15:05 Orbita Rekonstrüksiyonunda Yeni Ufuklar
Chingiz Rahimov

15:05 - 15:25 Orta Yüz Yetmezliklerinde İskeletsel İyileştirme
Mustafa Sancar Ataç

15:25 - 15:45 Oral ve Maksillofasiyal Bölgede Karşılaşılan Enfeksiyonlar ve Tedavileri
Ayşegül Tüzüner

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ

33. ULUSLARARASI BİLİMSEL KONGRESİ

16-18 Haziran 2026, Grand Cevahir Hotel - İstanbul

17 HAZİRAN 2026, ÇARŞAMBA — SALON 1

08:00 - 09:30 Sözlü Bildiri Oturumları

08:00 - 09:00 **MASTERCLASS (SALON 3) /** Moderatör: **Yusuf Emes, Suheyb Bilge**
Maksillofasiyal Bölgeye Ekstraoral Yaklaşımlar
Mustafa Sancar Ataç

Moderatörler: **Ergun Yücel, Emre Benlidayı**

09:10 - 09:30 Ağız, Diş ve Çene Cerrahisinde Dijital Paradoks: Yazılım Güvenliği, Algoritmik Güvenilirlik ve Siber Tehdit Analizi (Online)
Bedrettin Cem Şener

09:30 - 09:50 Dudak Damak Yarıkları Tennisson - Millard
Alper Alkan

09:50 - 10:10 Mandibular Sagittal Split Ramus Osteotomisi: Cerrahi Evrim ve Güncel Yaklaşımlar
Yavuz Tolga Korkmaz

10:10 - 10:30 Minimal İnvaziv Ortognatik Cerrahi: Teknikler, Endikasyonlar ve Sınırları
Mehmet Emre Yurttutan

10:30 - 10:50 Kahve Molası

Moderatörler: **Çağrı Delilbaşı, Nur Altıparmak**

10:50 - 11:10 Maksillofasiyal Cerrahide Kullanılan Malzemelerin Postoperatif Değerlendirmeye Etkileri
Yiğit Şirin

11:10 - 11:30 Eklem Fonksiyonu mu, Profil Estetiği mi? Ankiloz ve Kondiler Defektlerde İlerletme Stratejileri
Sina Uçkan

11:30 - 11:50 Kondiler Hiperplazide Ortodonti-Cerrahi İşbirliği: Tanı, Zamanlama ve Yöntem
Gökmen Kurt

11:50 - 12:10 Kondiler Hiperplazi ile İlişkili Mandibuler Asimetride Çözüm Önerileri
Sıdıka Sinem Akdeniz

12:10 - 13:30 Öğle Yemeği

Moderatörler: **Özen Doğan Onur, Sercan Küçükkurt**

13:30 - 13:50 X-Işınlarının Ötesi: Yapay Zeka ile Güçlendirilmiş Diş Hekimliğine Özel MRI Dönemine Giriş Diş Hekimliğinin Geleceği Neler Getiriyor?
Kaan Orhan

13:50 - 14:10 Oral Mukozanın Premalign Lezyonlarını Tanıyor muyuz?
Alp Saruhanoğlu

14:10 - 14:30 Oral Potansiyel Malign Lezyonlarda Altın Standart: Patoloji Tanısında Yapay Zeka Desteği
Merva Soluk Tekkeşin

14:30 - 14:40 Kahve Molası

Moderatörler: **Saim Yanık, Göksel Şimşek Kaya**

14:40 - 15:00 Çene Cerrahisinde Ne Zaman Sedasyon, Ne Zaman Genel Anestezi
Tolga Şitilci

15:00 - 15:20 Çene Eklemi Rahatsızlıkları Tedavisinde Hatalardan Neler Öğrendim?
Hanefi Kurt

15:20 - 15:40 Tartışma

15:40 - 15:50 Ara

15:50 - 16:10 **UYDU SEMPOZYUMU**

Neo Biotech
Satisfaction to Dentists

Moderatörler: **A. Burak Çankaya**

İmplant Tedavisinde Klinik Karar Algoritması: Stabilite Ölçümü ve Revizyon Teknikleri

Cem Tanyel

16:10 - 16:40 **ASİSTAN VAKA YARIŞMASI**

Jüri Üyeleri: **Ufuk Tatlı, Gökhan Gürler, Belir Atalay**

KURS ve MASTERCLASS PROGRAMI

17:00 - 18:00 **UYGULAMALI KURS (SALON 3) /** Moderatör: **Muhammet Bahattin Bingül**
Temel Mini Plak, Vida Osteosentezi
Başak Keskin Yalçın ve Firdevs Şenel

oypa medikal
KLS martin

17:00 - 18:00 **MASTERCLASS (SALON 4) /** Moderatör: **Serkan Yıldız**
Temporomandibular Eklem Cerrahisinde Güncel Teknikler ve İpuçları
Sinan Yasin Ertem

17:00 - 18:00 **MASTERCLASS (SALON 5) /** Moderatör: **Anıl Özyurt**
Ölmüş Makale Nasıl Diriltilir ?: Bir Atölye Çalışması
Yiğit Şirin

17:00 - 18:00 **MASTERCLASS (SALON 6) /** Moderatör: **Doğan Ilgaz Kaya**
Seramik İmplantlarda Cerrahi ve Protetik İpuçları
Belir Atalay

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33. ULUSLARARASI BİLİMSEL KONGRESİ

16-18 Haziran 2026, Grand Cevahir Hotel - İstanbul

18 HAZİRAN 2026, PERŞEMBE — SALON 1

08:00 - 09:30 Sözlü Bildiri Oturumları

Moderatörler: **Özge Doğanay, Hüseyin Can Tükel**

09:10 - 09:30 Oromandibular Distoni: Diş Hekimleri Neden Bilmelidir?
Olcay Şakar

09:30 - 09:50 Antirezorptif İlaç Kullanımı ve Dental İmplant Uygulamaları
Ceyda Özçakır Tomruk

09:50 - 10:10 İmplantlarda Biyolojik Alanın Oluşması
Korkud Demirel

10:10 - 10:30 Sinüs Liftte Risk ve Zorluk: Ameliyattan Önce Ne Kadarını Biliyoruz?
Bahadır Kan

10:30 - 10:45 Kahve Molası

Moderatörler: **Yakup Gülnahar, Serap Gülsever**

10:45 - 11:05 Skafold Destekli Alveolar Kemik Rejenerasyonu
Cem Üngör

11:05 - 11:25 Dijital Rehberli Dental İmplant Cerrahisinde Klinik Sorunlar ve Başa Çıkma Yöntemleri
Özgür Erdoğan

11:25 - 11:45 PTFE Membranlar: Gerçek mi Hayal mi?
A. Burak Çankaya

11:45 - 12:05 Shell tekniği: Klinik Öneriler ve İpuçları
Süleyman Bozkaya

12:00 - 13:30 Öğle Yemeği

Moderatörler: **Nesrin Saruhan Köse, Cansu Gül Koca**

13:30 - 13:50 Atrofik Dişsiz Maksillaların Rekonstrüksiyonunda "Sticky Bone" Tekniği mi ?
İliyak Greftleme mi?
Faysal Uğurlu

13:50 - 14:10 Kılavuzlu İmplant Cerrahisinde Klinik İpuçları
Nurettin Diker

14:10 - 14:30 Tam Dişsizlik Tedavisinde İmplant Destekli Hibrit Protez Uygulamaları: Klinik İpuçları
Özgür Bultan

14:30 - 14:45 Kahve Molası

Moderatörler: **Gelengül Urvasızoğlu, Öznur Özalp**

14:45 - 15:05 Maksillofasiyal Cerrahide Yapay Zeka: Güncel Uygulamalar ve Gelecek Yönelimler
Betül Gedik Tarhan

15:05 - 15:25 Araştırma Tipleri, Randomizasyon ve Yanlılık
Tamer Tüzüner

15:25 - 16:25 **GENÇ TAOMS**
Moderatörler: **Yavuz Tolga Korkmaz, Mehmet Ali Altay**

16:25- 17:00 Kapanış - Ödül Töreni ve Hediye Çekilişi

KURS ve MASTERCLASS PROGRAMI

17:00 - 18:00 **MASTERCLASS (SALON 3) /** Moderatör: **Samet Kundakçıoğlu**
Ortognatik Cerrahide İpuçları ve Püf Noktaları: Video Sunumu
Emre Benlidayı

17:00 - 18:00 **MASTERCLASS (SALON 4) /** Moderatör: **Senem Yıldırımtürk**
Geçmişe Dönüş: Subperiosteal İmplantlar
Emrah Soylu

17:00 - 18:00 **MASTERCLASS (SALON 5) /** Moderatör: **Zeynep Afra Akbıyık Az**
Farklı Klinik Senaryolarda Sert Doku Augmentasyon Cerrahisi ve Kritik Noktalar
Abdullah Özel

17:00 - 18:00 **UYGULAMALI KURS (SALON 6) /** Moderatör: **Nurettin Diker**
Botoks - Dolgu Uygulaması ve Komplikasyon Yönetimi Kursu
Barış Aydil

TAM METİN
SÖZLÜ BİLDİRİLER

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
33. ULUSLARARASI BİLİMSEL KONGRESİ
16-18 Haziran 2026, Grand Cevahir Hotel - İstanbul

SS-018

Guided Corticotomy for Accelerating Orthodontic Tooth Movement: A Literature Review and Case Report

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Introduction

In recent years, parallel to the increasing number of patients seeking orthodontic treatment, esthetic expectations have risen, and the demand for shorter treatment durations has become more evident. This has led to the development of alternative approaches aimed at accelerating orthodontic tooth movement.

Currently, piezosurgical devices, together with cone-beam computed tomography (CBCT) and three-dimensional reconstruction techniques, are increasingly preferred over conventional rotary burs in corticotomy procedures. These technologies enable reduced bone trauma, greater cutting precision, and faster postoperative healing.

Case Report

A corticotomy procedure under general anesthesia was planned in our department to accelerate the orthodontic movement of tooth #22 in a 19-year-old male patient undergoing orthodontic treatment.

Surgical Procedure

Under general anesthesia, a vestibular incision was made in the left anterior maxillary region, followed by elevation of a mucoperiosteal flap. After confirming the fit of the CBCT-based, preoperatively designed and 3D-printed surgical guide to the operative field, the planned corticotomy lines were created using piezosurgery. The flap was then closed with primary closure. The patient was followed for one year postoperatively, during which orthodontic tooth movement and clinical outcomes were evaluated.

Conclusion

Corticotomy-assisted orthodontic treatment is a valuable adjunctive technique with the potential to accelerate orthodontic tooth movement and shorten overall treatment duration.

The use of CBCT-based planning together with CAD/CAM-assisted surgical guides significantly improves the accuracy, safety, and predictability of corticotomy procedures.

Keywords: Accelerated tooth movement, Cone-Beam Computed Tomography (CBCT), Corticotomy-Assisted Orthodontic Treatment (CAOT)

Introduction

In recent years, parallel to the increasing number of patients seeking orthodontic treatment, esthetic expectations have risen, and the demand for shorter treatment durations has become increasingly evident. This has prompted the development of alternative approaches aimed at accelerating orthodontic tooth movement. (1,2)

The duration of orthodontic treatment is influenced by several factors, including the severity of the malocclusion, the need for tooth extraction, the clinician's experience, and patient compliance. Consequently, considerable efforts have been directed toward developing techniques capable of accelerating orthodontic tooth movement. (1,3–5)

Among these techniques, Corticotomy-Assisted Orthodontics (CAO) has been recognized as an effective surgical approach for accelerating orthodontic tooth movement. (1,6)

Contemporary corticotomy techniques have evolved through a series of procedural developments over the years.

- In 1959, Heinrich Köle described the first modern corticotomy procedure, referred to as "Bone Block Movement." In this technique, teeth were intended to move as a single block together with the surrounding cortical bone. However, because the procedure required extensive buccal and lingual osteotomies, it was associated with considerable surgical trauma and high patient morbidity. (2,3)
- In 1975, Suya modified Köle's technique by introducing a less invasive approach. The Suya technique was based on the principle of controlled fracturization, combining vertical buccal and apical corticotomies. Rather than completely mobilizing the bone block, the objective was to reduce cortical bone resistance and thereby stimulate biological acceleration of tooth movement. (2,5)
- In 1983, Harold Frost introduced the concept of the Regional Acceleratory Phenomenon (RAP) to explain the biological response of bone to surgical injury. Frost reported that surgical trauma induces localized osteoclastic and osteoblastic activity, resulting in accelerated bone turnover accompanied by a transient decrease in regional bone density. He observed that RAP begins within a few days after surgery and generally reaches its peak within 1–2 months. (3)
- In 1998, Liou and Huang introduced the periodontal ligament distraction technique. In this approach, extraction sockets were surgically modified, and specially designed distraction devices were used to achieve rapid canine retraction. (1,5)
- In 2001, the Wilcko brothers combined corticotomy with alveolar bone grafting and introduced Periodontally Accelerated Osteogenic Orthodontics (PAOO), also known as Wilckodontics. This technique not only accelerated orthodontic tooth movement but also aimed to increase alveolar bone volume and enhance periodontal support. (1,2)
- In 2009, Dibart et al. popularized the Piezocision™ technique, which is performed without flap elevation. This minimally invasive approach utilizes piezoelectric surgical inserts through gingival micro-incisions, thereby minimizing surgical trauma and reducing postoperative healing time. (1,2,6)

Case Report

A 19-year-old systemically healthy male patient undergoing orthodontic treatment was scheduled to undergo corticotomy surgery under general anesthesia in our department to accelerate the orthodontic movement of tooth #22.

Following CBCT-based planning, a bone-supported surgical guide was designed to determine the corticotomy boundaries and incision lines using Meshmixer software.

Safe interradicular distances were calculated, and vertical corticotomy lines were virtually planned. Virtual plates corresponding to the width of the piezosurgical inserts (e.g., 0.4 mm or 1.0 mm) were positioned to define the cutting pathways. Dedicated guide slots (windows) allowing precise insertion of the piezosurgical tip were incorporated into the guide design. Based on the virtual planning data, a patient-specific surgical guide with an accurate intraoral fit was finalized and fabricated using a 3D printer with biocompatible resin.

Under general anesthesia, a vestibular incision was made in the left anterior maxillary region, followed by elevation of a full-thickness mucoperiosteal flap. After confirming the fit of the preoperatively designed surgical guide to the operative field, the corticotomy was performed through the guide slots using a piezosurgical device, enabling precise osteotomies along the planned corticotomy lines without deviation from the virtual surgical plan. Segment mobilization was subsequently achieved, and the flap was closed by primary intention.

Conclusion

Corticotomy-assisted orthodontic treatment has emerged as an effective adjunctive technique with the potential to accelerate orthodontic tooth movement and shorten overall treatment time. The reduction in cortical bone resistance contributes to a marked increase in the rate of tooth movement, particularly during the early stages of treatment. (2,5)

In the present case, the objective was to stimulate the Regional Acceleratory Phenomenon (RAP), as described by Frost (1983), in order to accelerate the movement of a single tooth. (2,6)However, the acceleration observed in this case was not considered clinically significant. Previous studies have suggested that the magnitude of acceleration is directly related to the extent of the surgical intervention, and that corticotomies confined to a single tooth region may induce a weaker regional RAP response than procedures involving larger alveolar segments. (2,3)

Although flapless piezoelectric techniques minimize surgical trauma, flap elevation in the present case provided direct visualization of the surgical field, thereby facilitating precise execution of the planned corticotomy. Nevertheless, the more invasive nature of this approach may have resulted in greater postoperative surgical morbidity. (2)

The literature indicates that the incidence of iatrogenic root damage (IRD) during freehand corticotomy procedures may reach up to 23%, particularly in the mandibular anterior region. In the present case, the use of a digitally designed patient-specific surgical guide minimized this risk and enhanced surgical accuracy and safety. (3,5)

Discussion

The combination of piezoelectric instrumentation, flap elevation, and digitally designed surgical guides maximizes surgical precision and procedural predictability.

Although flapless techniques offer advantages in terms of patient comfort and reduced postoperative morbidity, the hybrid approach employed in the present case may represent an optimal alternative for adult patients with dense cortical bone or anatomically challenging regions. By providing direct visualization of the operative field while maintaining the accuracy afforded by a patient-specific surgical guide, this technique enhances both surgical safety and biological effectiveness.

Future studies should further investigate the relationship between the depth and extent of corticotomy and the biological response mediated by the Regional Acceleratory Phenomenon (RAP). In addition, research should focus on establishing optimized surgical guide design parameters that maximize the rate of orthodontic tooth movement in patients with varying bone densities.

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Figure1: Three-dimensional (3D)-printed piezosurgical guide.

Figure2: Flap elevation before corticotomy.

Figure3: Intraoperative view of the corticotomy lines.

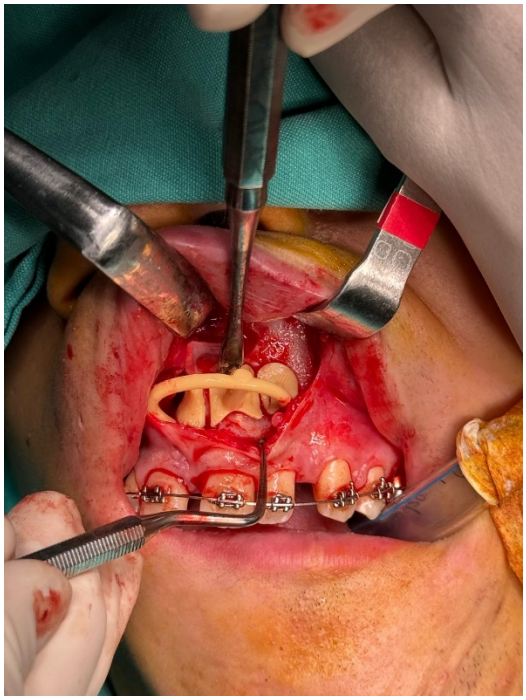

Figure4: Verification of surgical guide fit.

SS-023

Management of Large Odontogenic Keratocysts of the Mandible by Decompression and Secondary Enucleation: A Report of Two Cases

Abstract

Objective: Odontogenic keratocyst (OKC) is a developmental odontogenic cyst characterized by locally aggressive behavior and a high recurrence potential. In large lesions, primary enucleation may increase the risk of complications such as inferior alveolar nerve injury, mandibular fracture, and extensive bone defects. This report aims to present the clinical and radiographic outcomes of decompression followed by secondary enucleation in two patients diagnosed with large mandibular OKCs.

Case Presentation: Two patients presenting with extensive radiolucent lesions in the mandible underwent comprehensive clinical and radiographic evaluation. In both cases, the diagnosis of odontogenic keratocyst was confirmed histopathologically following incisional biopsy. Due to the large size of the lesions and their close relationship with adjacent anatomical structures, decompression was performed as the initial treatment. After approximately 3–4 months of regular irrigation and clinical-radiographic follow-up, a marked reduction in lesion size was observed. Secondary enucleation and curettage were subsequently performed under general anesthesia.

Conclusion: In both cases, decompression resulted in significant reduction of lesion volume, allowing a more conservative surgical approach during secondary enucleation. No postoperative complications or early recurrence were observed during follow-up. Decompression followed by secondary enucleation appears to be a safe and effective treatment option for the management of large odontogenic keratocysts of the mandible.

Keywords: Odontogenic keratocyst, decompression, enucleation, mandible, case report.

INTRODUCTION

Odontogenic keratocyst (OKC) is a developmental odontogenic cyst arising from remnants of the dental lamina. It is characterized by a thin, fragile cystic wall lined by parakeratinized stratified squamous epithelium. Due to its locally aggressive growth pattern and high recurrence rate, OKC is considered one of the most clinically significant odontogenic cysts.

OKCs occur most frequently in the posterior mandible and ramus region and may remain asymptomatic for long periods. They are often detected incidentally during routine radiographic examinations. However, as they enlarge, they may cause pain, swelling, cortical expansion, and displacement of adjacent anatomical structures.**(FİGURE 1)**

Various surgical treatment modalities have been proposed for OKC, including enucleation, marsupialization, decompression, peripheral ostectomy, application of Carnoy's solution, and resection. The choice of treatment depends on several factors, including lesion size, anatomical location, proximity to vital structures, and patient-related considerations. In large lesions, primary enucleation may increase the risk of inferior alveolar nerve injury, mandibular fracture, and extensive bone defects. Therefore, decompression followed by secondary enucleation has been advocated as a more conservative treatment strategy.

The present report describes the clinical and radiographic outcomes of two patients with large mandibular odontogenic keratocysts treated by decompression followed by secondary enucleation and discusses the findings in light of the current literature.

CASE PRESENTATION

Two patients presenting with extensive radiolucent lesions of the mandible were clinically and radiographically evaluated at the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Harran University. Following clinical examination, panoramic radiography and cone-beam computed tomography (CBCT) revealed large expansile cystic lesions involving the posterior mandible in both patients. To establish a definitive diagnosis, incisional biopsies were performed under local anesthesia. Histopathological examination confirmed the diagnosis of odontogenic keratocyst (OKC) in both cases.**(FİGURE 2)**

Considering the large size of the lesions, the marked thinning of the cortical bone, and their close proximity to the inferior alveolar nerve, a two-stage conservative treatment protocol was selected instead of primary enucleation. During the first stage, decompression was performed under local anesthesia by placing a drain into the cystic cavity. The patients were thoroughly instructed to maintain drain patency through daily irrigation with sterile saline solution.**(FİGURE 3)**

The patients were followed monthly with clinical and radiographic examinations. Changes in lesion size, bone regeneration, and clinical healing were carefully monitored throughout the follow-up period. After approximately 3–4 months, a marked reduction in lesion volume and evidence of new bone formation were observed in both cases. Consequently, secondary enucleation and curettage were performed under general anesthesia.(**FİGURE 4)**

DISCUSSION

The primary objective in the treatment of odontogenic keratocysts is complete removal of the lesion while minimizing the risk of recurrence. However, primary enucleation of large lesions may be associated with complications such as mandibular fracture, inferior alveolar nerve injury, and extensive osseous defects.**(1,3)**

Recent studies have demonstrated that decompression decreases intracystic pressure, resulting in a reduction in lesion size, promotion of bone regeneration, and preservation of adjacent anatomical structures.**(2,5)** Stanbouly et al. reported that secondary enucleation following decompression was associated with lower recurrence rates compared with single-stage enucleation.**(1)** Similarly, in their systematic review, Borrás-Ferreres et al. concluded that decompression represents an effective conservative treatment modality that reduces surgical morbidity, particularly in large odontogenic keratocysts.**(2)**

Marí-Roig et al. also reported favorable clinical and radiographic outcomes following decompression combined with secondary enucleation in patients with large OKCs **(3).** Likewise, Jain et al. and Malviya et al. emphasized that decompression facilitates bone regeneration and reduces the risk of damage to adjacent anatomical structures before definitive surgery **(4,5).**

In the present cases, decompression resulted in a substantial reduction in lesion volume, allowing secondary enucleation to be performed more safely and conservatively. The absence of postoperative complications or early recurrence during follow-up is consistent with previous reports **(1,5).**

CONCLUSION

The combination of decompression and secondary enucleation represents an effective treatment strategy for large odontogenic keratocysts by reducing surgical morbidity and facilitating preservation of vital anatomical structures. Reduction in lesion volume following decompression allows for a safer and more controlled definitive surgical procedure, leading to favorable clinical outcomes. Nevertheless, because of the well-documented recurrence potential of OKCs, long-term clinical and radiographic follow-up remains essential.

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FİGURE 1

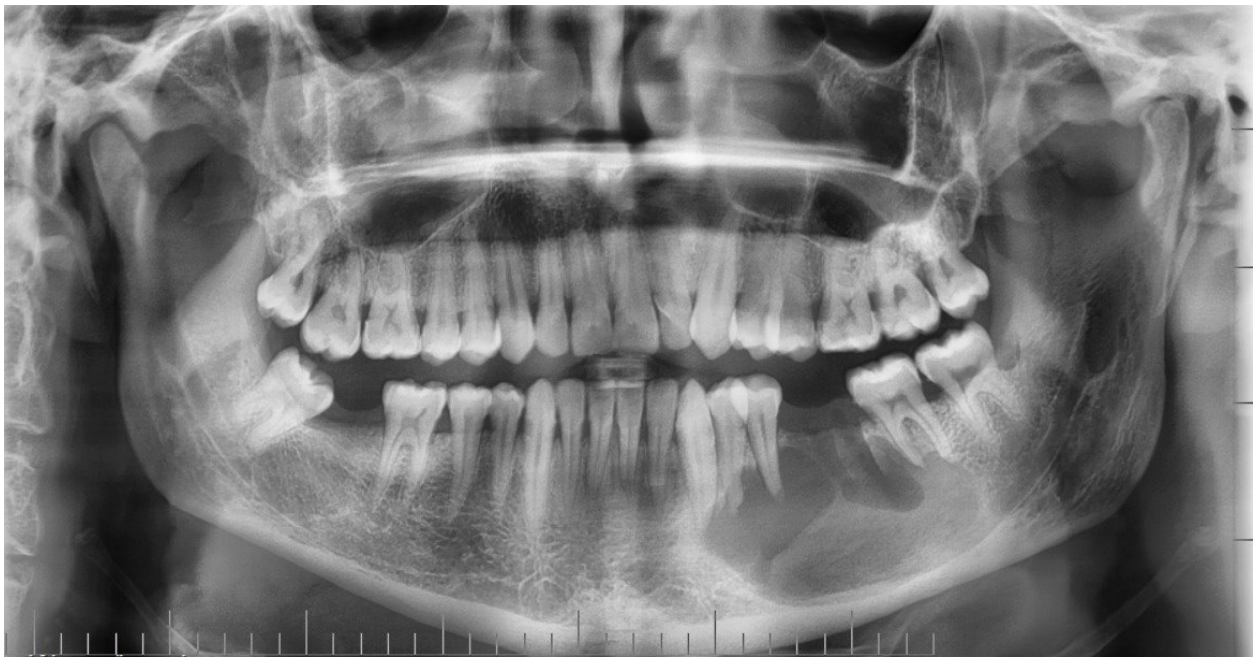


FİGURE 2

FİGURE 3

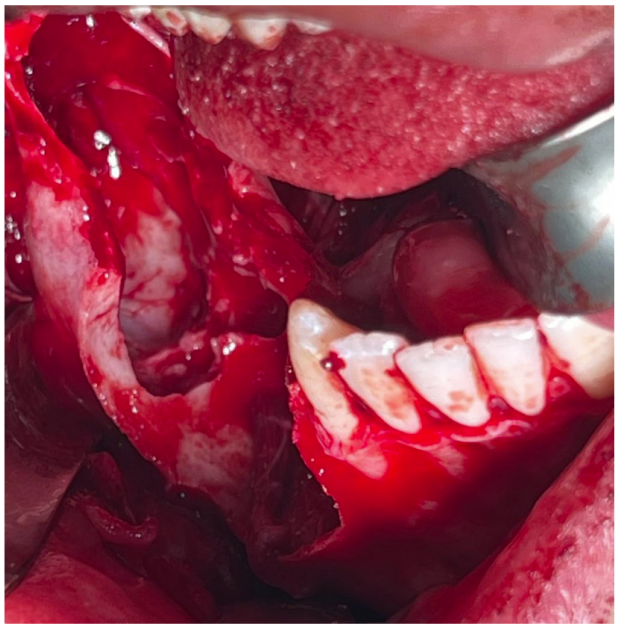
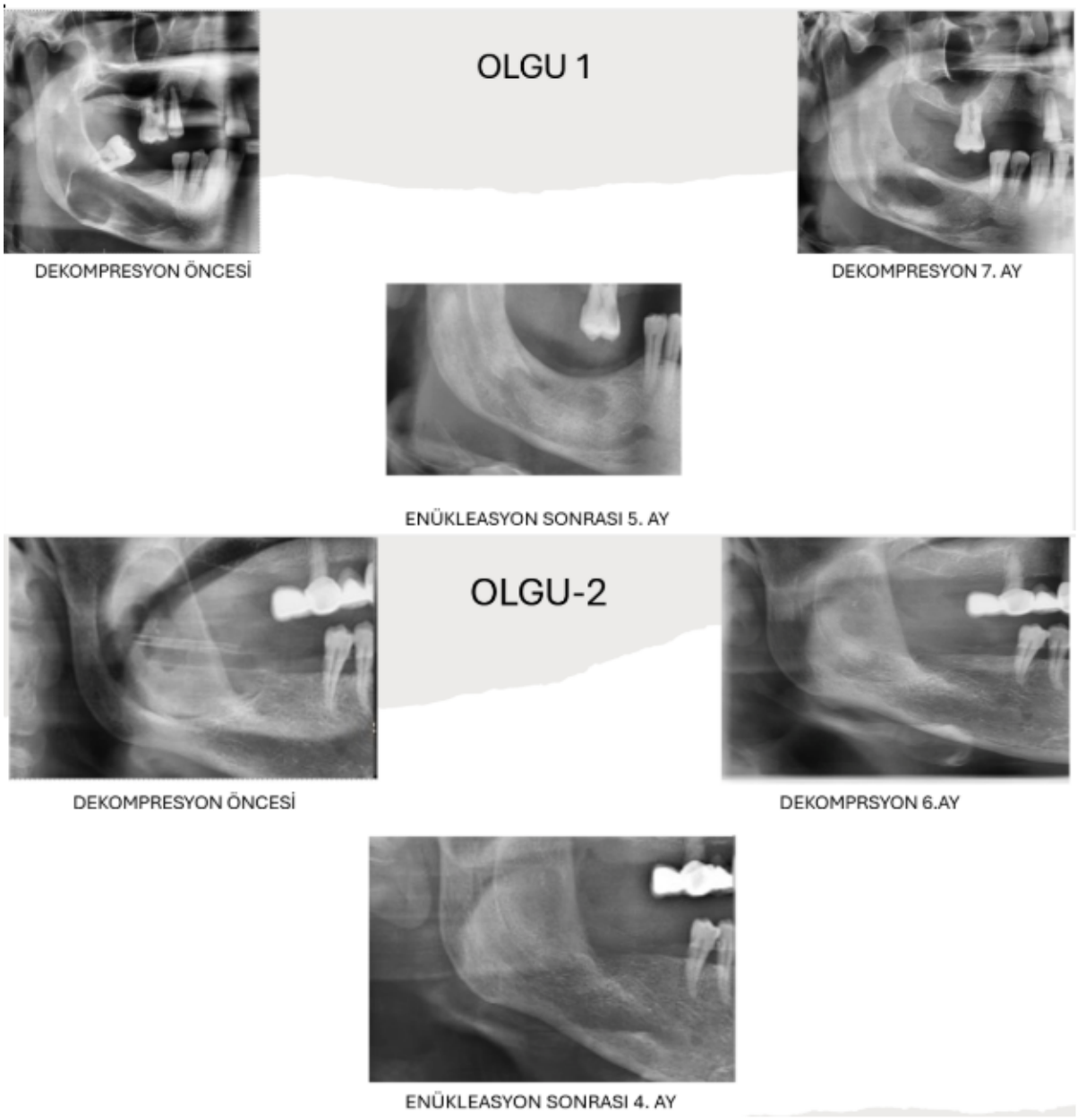


FİGURE 4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ENÜKLEASYON SONRASI 4. AY

SS-026

Surgical Management of Mandibular Fractures in Pediatric Patients: A Retrospective Multicenter Study from Two Tertiary Referral Centers

Draft manuscript based on the corrected multicenter database

Abstract

Background

Mandibular fractures are the most common facial fractures in children and adolescents. Surgical management remains challenging because treatment must restore anatomy and function while respecting mandibular growth and dentition-related considerations.

Purpose

To describe the pooled cohort of surgically treated pediatric mandibular fractures and to compare demographic characteristics, fracture patterns, treatment strategy, and outcomes between two tertiary referral centers.

Methods

A retrospective multicenter observational study was performed on 48 patients younger than 18 years who underwent surgical treatment for mandibular fractures. Demographic data, trauma etiology, fracture distribution, treatment modality, plate removal, maximum mouth opening, mandibular deviation, occlusal status, and radiological bone score were recorded. The full cohort was analyzed as a single series and subsequently compared between the Italian and Turkish centers.

Results

The pooled cohort comprised 48 patients, with a mean age of 14.7 ± 3.3 years and a male predominance (38 (79.2)). Road traffic accidents were the most common trauma mechanism (20 (41.7)). Symphyseal involvement was the most frequent fracture pattern (34 (70.8)), followed by angle and parasymphyseal involvement (both 26 (54.2)). Plate fixation was used in 26 (54.2) of cases. The mean bone score was 2.43 ± 0.70, and the mean maximum mouth opening was 46.3 ± 7.5 mm. In the multicenter analysis, the Turkish cohort included all patients younger than 12 years (7 (23.3) vs 0 (0.0), p=0.036) and showed more condylar (11 (36.7) vs 1 (5.6), p=0.018) and body involvement (7 (23.3) vs 0 (0.0), p=0.036). The Italian cohort showed more angle (14 (77.8) vs 12 (40.0), p=0.017) and parasymphyseal involvement (14 (77.8) vs 12 (40.0), p=0.017). Treatment strategy differed substantially, with plate fixation predominating in Turkey and mixed treatment predominating in Italy (p <0.001).

Conclusions

Surgical treatment of pediatric mandibular fractures provided satisfactory anatomical and functional outcomes in both centers. The pooled analysis supports surgery as a reliable option in selected cases, while the multicenter comparison highlights center-specific differences in fracture distribution and operative strategy.

Keywords

Pediatric mandibular fractures; pediatric facial trauma; multicenter study; open reduction and internal fixation; maxillofacial trauma.

Introduction

Pediatric mandibular trauma differs from adult mandibular trauma in several relevant aspects, including fracture biomechanics, remodeling potential, dentition stage, and the relationship between surgical access and developing

tooth buds. Although many pediatric fractures can be managed conservatively, surgery is indicated when displacement, instability, fracture combination, or occlusal derangement make closed treatment insufficient.

Despite its clinical importance, the literature on surgically treated pediatric mandibular fractures remains comparatively limited, and multicenter analyses are uncommon. A more detailed understanding of case distribution and outcomes across referral centers may help clarify whether observed differences reflect biology, trauma mechanisms, or institutional treatment preferences.

The present study had a dual purpose. First, we analyzed the entire cohort as a single pooled series in order to characterize surgically treated pediatric mandibular fractures overall. Second, we performed a multicenter comparison between the Italian and Turkish tertiary referral centers.

Materials and Methods

This was a retrospective multicenter observational study based on the consolidated database of two tertiary referral centers. Consecutive patients younger than 18 years who underwent surgical treatment for mandibular fractures were included.

The study dataset comprised age, sex, trauma etiology, main fracture site, fracture combinations, treatment modality, plate removal, and follow-up outcomes. To describe fracture distribution more precisely, binary indicators were derived for condylar, angle, body, symphyseal, and parasymphyseal involvement by combining the primary site with the documented fracture combination. Clinical outcomes included maximum mouth opening, mandibular deviation, and occlusal status. Radiological outcome was summarized using the postoperative bone score.

Continuous variables are presented as mean ± standard deviation, while categorical variables are presented as counts and percentages. The pooled cohort was analyzed first. Comparisons between centers were then explored using non-parametric testing for continuous variables and exact or contingency-based comparisons for categorical variables. A p value below 0.05 was considered statistically significant.

Results

Pooled cohort analysis

The study included 48 pediatric patients. Mean age was 14.7 ± 3.3 years, and the cohort showed a marked male predominance (38 (79.2)). Patients younger than 12 years accounted for 7 (14.6) of the sample.

Road traffic accidents were the leading trauma mechanism (20 (41.7)), followed by falls (10 (20.8)), assault (9 (18.8)), other causes, and sports-related injuries (4 (8.3)).

When fracture involvement was examined across the entire cohort, the symphysis was the most frequently affected region (34 (70.8)), followed by angle involvement (26 (54.2)), parasymphyseal involvement (26 (54.2)), condylar involvement (12 (25.0)), and body involvement (7 (14.6)).

Plate fixation was the most common surgical strategy (26 (54.2)), while mixed treatment was used in 22 (45.8) of cases. Plate removal was performed in 9 (18.8). Overall outcomes were favorable: any postoperative complication occurred in 14 (29.2), malocclusion in 5 (10.4), the mean postoperative bone score was 2.43 ± 0.70, and mean maximum mouth opening was 46.3 ± 7.5 mm.

Multicenter comparison

The Italian center contributed 18 patients and the Turkish center 30 patients. Mean age did not differ significantly between centers (15.6 ± 1.5 vs 14.1 ± 3.9 years, p=0.673), and sex distribution was also comparable (p=0.282). However, all patients younger than 12 years were observed in the Turkish cohort (7 (23.3) vs 0 (0.0), p=0.036).

Fracture distribution differed across centers. Condylar involvement was significantly more frequent in Turkey (11 (36.7)) than in Italy (1 (5.6), p=0.018). Body involvement was present only in the Turkish cohort (7 (23.3) vs 0

(0.0), p=0.036). In contrast, angle involvement (14 (77.8) vs 12 (40.0), p=0.017) and parasymphyseal involvement (14 (77.8) vs 12 (40.0), p=0.017) were more frequent in the Italian cohort. Symphyseal involvement was common in both cohorts and did not differ significantly (p=0.196).

Treatment strategy also differed markedly. Plate fixation predominated in Turkey (25 (83.3)), whereas mixed treatment predominated in Italy (17 (94.4)); this difference was highly significant (p <0.001). Plate removal was uncommon overall and did not differ significantly between centers (p=0.152). Rates of any postoperative complication, malocclusion, maximum mouth opening, and mean bone score were comparable between centers (all p > 0.05).

Table 1. Demographic, treatment, and outcome variables.

Variable	Overall	Italy	Turkey	p value
Patients, n	48	18	30	
Age, years (mean ± SD)	14.7 ± 3.3	15.6 ± 1.5	14.1 ± 3.9	0.673
Male sex, n (%)	38 (79.2)	16 (88.9)	22 (73.3)	0.282
Age <12 years, n (%)	7 (14.6)	0 (0.0)	7 (23.3)	0.036
Road traffic accidents, n (%)	20 (41.7)	8 (44.4)	12 (40.0)	0.108
Plate fixation, n (%)	26 (54.2)	1 (5.6)	25 (83.3)	<0.001
Mixed treatment, n (%)	22 (45.8)	17 (94.4)	5 (16.7)	
Plate removal, n (%)	9 (18.8)	1 (5.6)	8 (26.7)	0.152
Any postoperative complication, n (%)	14 (29.2)	3 (16.7)	11 (36.7)	0.196
Malocclusion, n (%)	5 (10.4)	1 (5.6)	4 (13.3)	0.634
Maximum mouth opening, mm (mean ± SD)	46.3 ± 7.5	44.7 ± 8.4	47.4 ± 6.8	0.336
Bone score (mean ± SD)	2.43 ± 0.70	2.28 ± 0.75	2.52 ± 0.66	0.267

Table 2. Fracture-site distribution by center.

Variable	Overall	Italy	Turkey	p value
Condylar involvement, n (%)	12 (25.0)	1 (5.6)	11 (36.7)	0.018
Angle involvement, n (%)	26 (54.2)	14 (77.8)	12 (40.0)	0.017
Body involvement, n (%)	7 (14.6)	0 (0.0)	7 (23.3)	0.036
Symphyseal involvement, n (%)	34 (70.8)	15 (83.3)	19 (63.3)	0.196
Parasymphyseal involvement, n (%)	26 (54.2)	14 (77.8)	12 (40.0)	0.017

Discussion

The present analysis provides two complementary perspectives on surgically treated pediatric mandibular fractures. The pooled cohort confirms that these injuries occur predominantly in male adolescents, are frequently related to road traffic accidents, and can be managed surgically with favorable radiological and functional outcomes. At the same time, the multicenter comparison shows that case mix and surgical strategy are not necessarily uniform across tertiary centers.

The pooled findings are clinically coherent. Symphyseal involvement was the most frequent fracture pattern, while condylar, angle, and parasymphyseal injuries were also common. The overall complication burden remained limited, malocclusion was uncommon, and the mean bone score indicated satisfactory postoperative reduction.

The differences observed between centers are also informative. The Turkish cohort included all children younger than 12 years and showed more condylar and body involvement, whereas the Italian cohort showed more angle and parasymphyseal involvement. These differences may reflect local referral patterns, trauma mechanisms, or differences in case selection for surgery rather than differences in technical performance alone.

The greatest between-center divergence concerned treatment strategy, with plate fixation predominating in Turkey and mixed treatment predominating in Italy. Nevertheless, the absence of significant differences in bone score, mouth opening, or malocclusion suggests that both institutional approaches were capable of achieving satisfactory results within their respective case mix.

This study has the inherent limitations of a retrospective analysis, including dependence on the completeness of existing records and non-randomized treatment allocation. However, the use of a consolidated multicenter database and the explicit center-by-center comparison strengthen the descriptive value of the study and make the manuscript suitable as a clinically oriented observational series.

Conclusions

In this multicenter retrospective study, surgically treated pediatric mandibular fractures showed favorable anatomical and functional outcomes overall. The pooled cohort supports surgical management as a reliable option in selected pediatric cases. The multicenter comparison indicates that fracture distribution and operative strategy may differ between tertiary referral centers, while postoperative outcomes remain broadly comparable.

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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SS-035

Patient-Specific Subperiosteal Implants in the Rehabilitation of Severe Jaw Atrophy: From Digital Workflow to Clinical Application—A Case Report with Literature Review

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1. Introduction

Severe alveolar bone atrophy remains one of the greatest challenges in implant-supported oral rehabilitation (1). Progressive bone resorption following tooth loss may result in insufficient bone volume for the placement of conventional endosseous implants, particularly in the posterior maxilla where maxillary sinus pneumatization further limits the available bone height (2-4). Traditionally, these cases have been managed using extensive augmentation procedures, including sinus floor elevation, onlay bone grafting, zygomatic implants, or short implants (5). However, these treatment modalities are often associated with prolonged treatment time, increased surgical morbidity, higher costs, and unpredictable outcomes, especially in elderly or medically compromised patients (6,7).

Subperiosteal implants were first introduced in the 1940s as an alternative treatment for patients with advanced jaw atrophy who were not suitable candidates for endosseous implant placement (8). Conventional subperiosteal implants gradually fell out of favor because their fabrication required direct intraoperative impressions of the exposed bone surface, frequently resulting in inadequate passive fit, implant exposure, bacterial colonization, recurrent infection, and ultimately poor long-term clinical outcomes (9,10).

Recent advances in digital technologies have renewed interest in patient-specific subperiosteal implants. High-resolution computed tomography (CT), computer-aided design/computer-aided manufacturing (CAD/CAM), and additive manufacturing techniques enable the fabrication of customized titanium frameworks that precisely conform to each patient's anatomical morphology (11). Unlike conventional designs, modern patient-specific implants can be digitally planned according to anatomical landmarks and prosthetic requirements before surgery, improving passive fit, primary stability, and surgical predictability while reducing operative time (12,13).

Among currently available manufacturing technologies, selective laser melting (SLM) has become one of the most widely adopted additive manufacturing methods for producing customized titanium implants (14). The use of Ti-6Al-4V Grade 23 alloy offers favorable mechanical properties, corrosion resistance, biocompatibility, and

high fatigue strength, making it particularly suitable for long-term maxillofacial applications (15). Furthermore, digital planning facilitates accurate positioning of fixation screws within areas of adequate cortical bone while avoiding critical anatomical structures such as the infraorbital nerve, nasal cavity, and maxillary sinus (16,17).

Although several recent clinical reports (9, 18, 19) have demonstrated encouraging short-term outcomes using customized subperiosteal implants, evidence remains limited, and standardized digital workflows have not yet been fully established. In particular, detailed descriptions integrating digital planning, implant manufacturing, surgical placement, prosthetic rehabilitation, and postoperative follow-up remain scarce in the current literature.

This case report describes the complete digital workflow and clinical management of a patient with severe maxillary atrophy rehabilitated using a dual-piece patient-specific titanium subperiosteal implant. The report illustrates each stage of treatment, from virtual planning and additive manufacturing to surgical placement and prosthetic rehabilitation, while discussing the advantages, limitations, and current evidence regarding this emerging treatment modality.

2. Case Report

2.1 Patient Information

A 53-year-old male patient was referred to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Istanbul University, seeking fixed prosthetic rehabilitation due to long-standing edentulism and severe maxillary atrophy. The patient reported dissatisfaction with removable prostheses and expressed a desire for a fixed implant-supported restoration. His medical history was noncontributory, with no systemic diseases or regular medication use. Although he had a history of cigarette smoking, he had discontinued smoking several years before treatment. Clinical and radiographic examination revealed advanced maxillary alveolar ridge resorption consistent with Cawood and Howell Class V atrophy (Fig 1), rendering conventional endosseous implant placement unsuitable without extensive bone augmentation procedures.

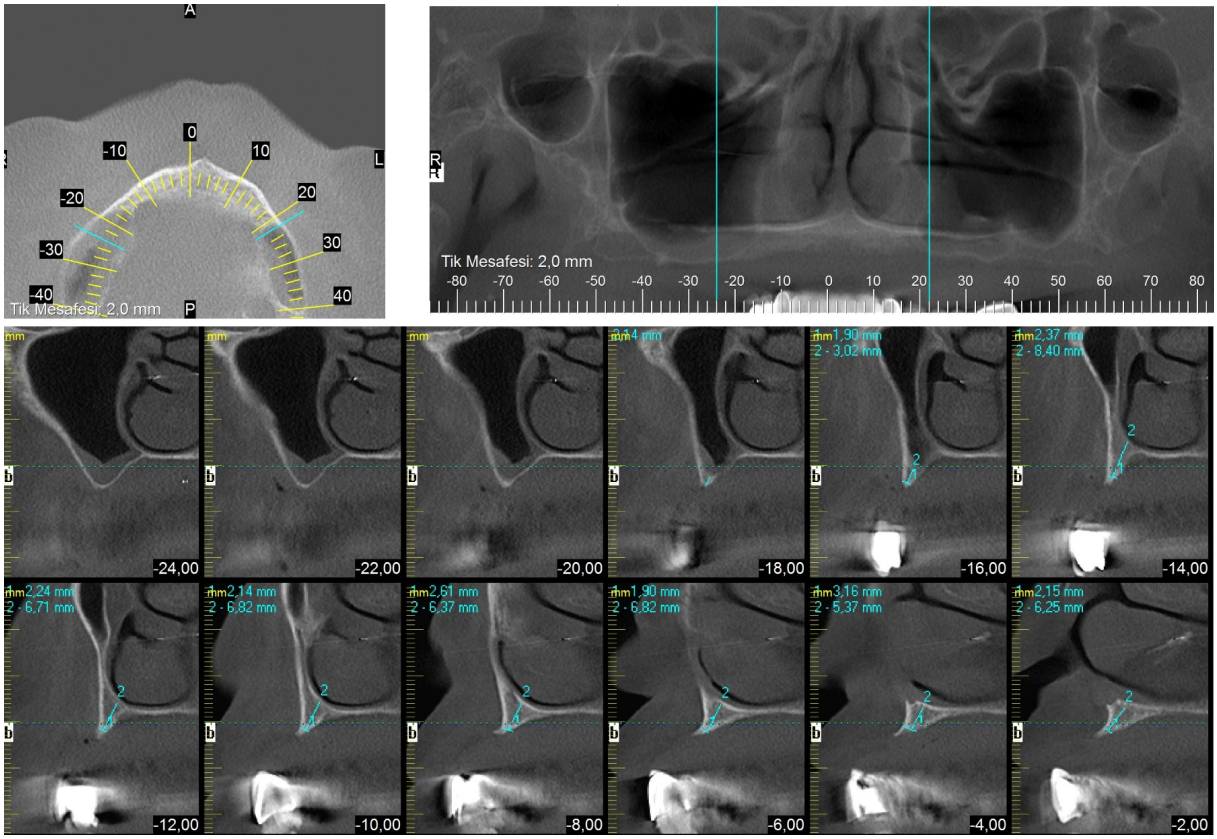


Fig 1. Preoperative CBCT images demonstrating severe maxillary atrophy (Cawood and Howell Class V).

2.2 Digital Planning and Implant Fabrication

Preoperative evaluation was performed using high-resolution CT. Digital segmentation of the maxillary anatomy was carried out using Materialise Mimics software, followed by three-dimensional reconstruction and implant design using 3-matic, Rhinoceros (Rhino), and Exocad software. A patient-specific dual-piece subperiosteal implant was virtually designed to achieve intimate adaptation to the residual maxillary bone while avoiding critical anatomical structures. Particular attention was paid to maximizing skeletal support at the zygomatic buttress, piriform aperture, and palatal vault. The implant was manufactured from Ti-6Al-4V Grade 23 titanium alloy using additive manufacturing technology and underwent standard post-processing and sterilization before surgery (Fig 2).

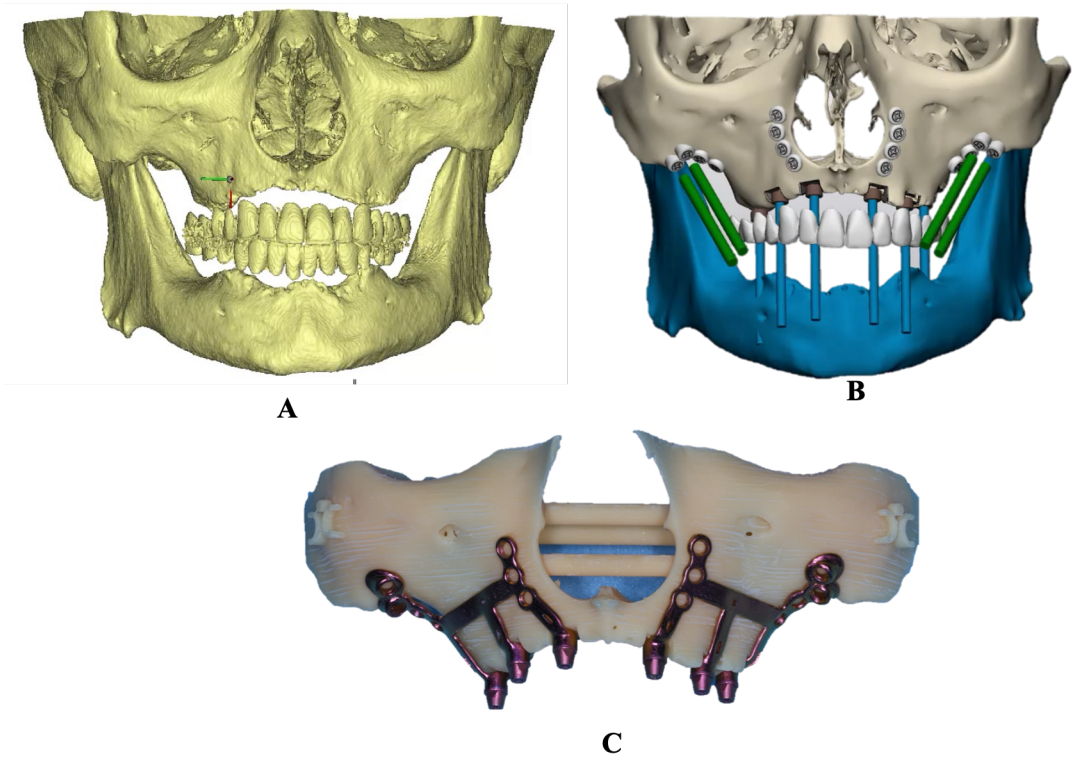
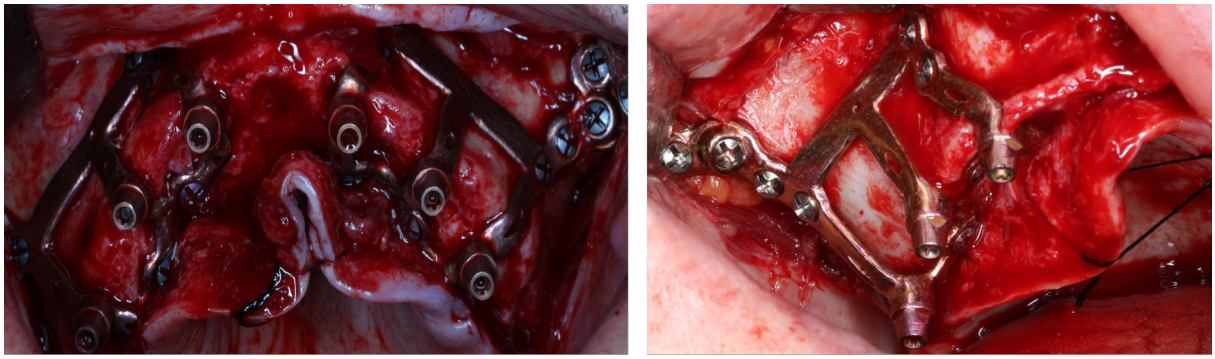


Fig 2. Digital workflow for patient-specific subperiosteal implant fabrication, including segmentation, virtual design, and additive manufacturing.

2.3 Surgical Procedure

Surgical treatment was performed under intravenous conscious sedation combined with local anesthesia. A crestal incision extending bilaterally from the maxillary tuberosities to the piriform aperture and zygomatic buttresses was made, followed by full-thickness mucoperiosteal flap elevation to expose the residual maxillary bone. After verification of passive adaptation, the customized dual-piece subperiosteal implant was positioned and sequentially stabilized using 18 titanium fixation screws, with nine screws placed on each side (Fig 3). Fixation was achieved by engaging multiple anatomical buttresses to optimize primary stability. Four screws were inserted into each zygomatic buttress region, including two 12-mm screws and one 6-mm and one 5-mm screw. Three 5-mm screws were placed along the lateral aspect of the piriform aperture, while two palatal fixation screws measuring 5 mm and 6 mm were inserted into the palatal cortical bone. Following confirmation of implant stability, the surgical field was irrigated with sterile saline, and the mucoperiosteal flaps were repositioned and closed with tension-free primary closure using resorbable sutures.

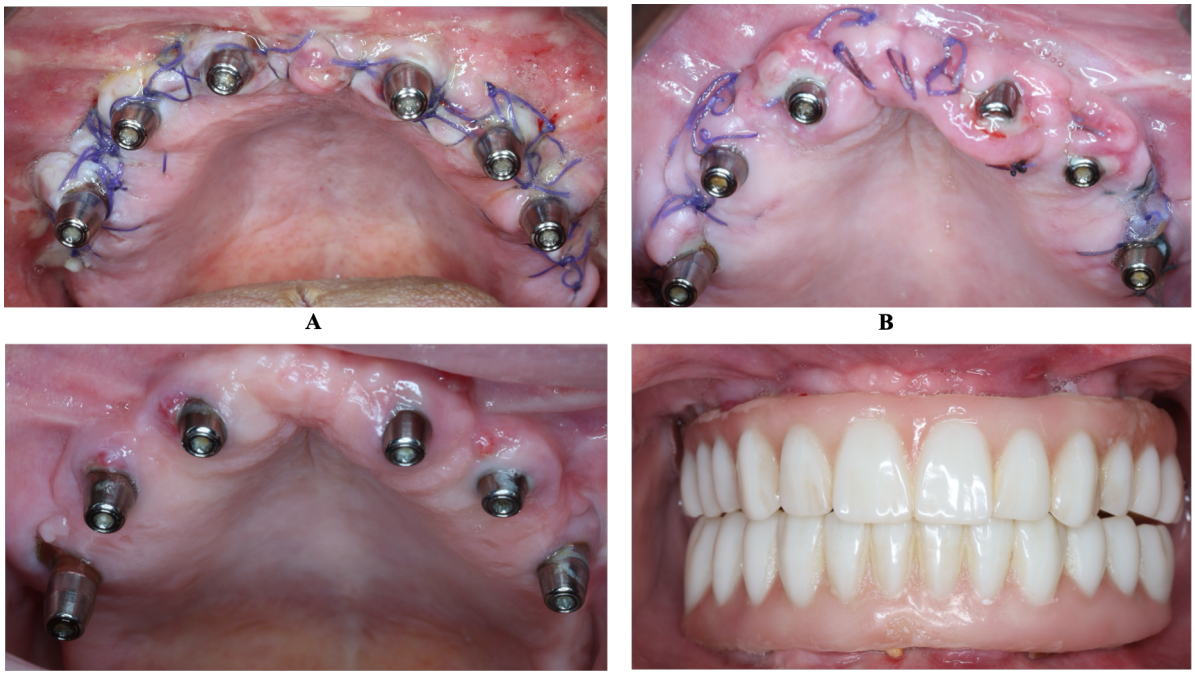


A B

Fig 3. Intraoperative placement and fixation of the dual-block titanium subperiosteal implant.

2.4 Prosthetic Rehabilitation

Postoperative healing was uneventful. Clinical follow-up demonstrated satisfactory soft tissue healing without signs of infection or implant mobility. Eight weeks after surgery, following complete soft tissue maturation, a provisional fixed prosthesis was delivered. Definitive prosthetic rehabilitation consisting of a titanium bar-supported zirconia prosthesis was completed three months postoperatively (Fig 4).



A B C D

Fig 4. Postoperative clinical outcomes. (A) Third postoperative day showing favorable early wound healing. (B) Seventh postoperative day after suture removal with uneventful soft tissue healing. (C) Eight-week postoperative view demonstrating complete soft tissue maturation around the multi-unit abutments. (D) Provisional fixed prosthesis delivered after soft tissue healing, showing satisfactory esthetic and functional rehabilitation.

2.5 Follow-up

The patient was followed clinically and radiographically for eight months (Fig 5). During follow-up, a localized soft tissue dehiscence measuring approximately 3 mm developed around one of the posterior abutments. The exposed area remained stable without evidence of infection, implant mobility, pain, or peri-implant inflammation and therefore required no surgical intervention. The implant maintained excellent stability throughout the observation period, and the patient reported significant improvement in masticatory efficiency, speech, comfort, and overall satisfaction with the definitive prosthetic rehabilitation.

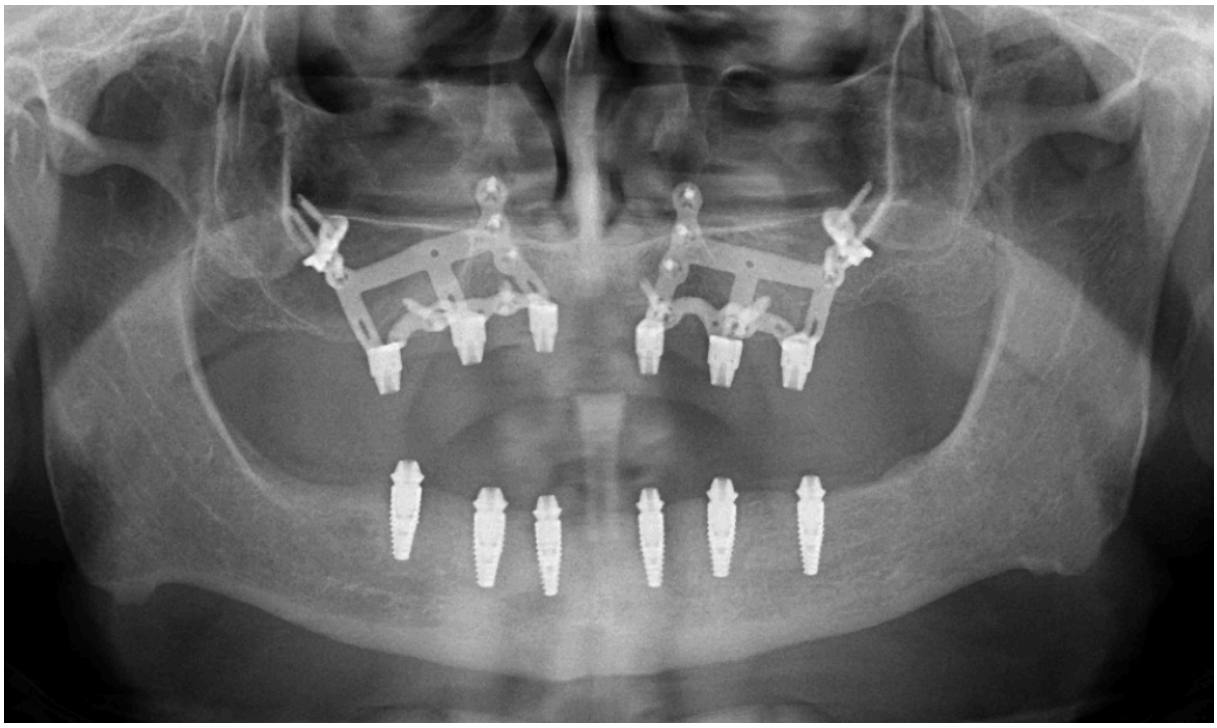


Fig 5. Postoperative panoramic radiograph demonstrating accurate adaptation and fixation of the implant.

3. Discussion

Rehabilitation of patients with severe maxillary atrophy remains one of the most challenging situations in implant dentistry. Conventional treatment approaches, including extensive bone augmentation, sinus floor elevation, or zygomatic implants, are associated with increased surgical complexity, longer treatment duration, higher costs, and greater patient morbidity (20-22). Advances in digital technologies have renewed interest in patient-specific subperiosteal implants, which offer a graftless alternative for patients with insufficient bone volume for conventional endosseous implants (23).

The present case demonstrates the feasibility of a fully digital workflow, encompassing CT-based virtual planning, computer-aided design, additive manufacturing, and prosthetic rehabilitation. The customized dual-piece titanium framework achieved excellent adaptation to the residual maxillary anatomy and allowed stable

fixation through multiple anatomical buttresses, including the zygomatic buttress, piriform aperture, and palatal cortex. This broad distribution of fixation screws is intended to enhance primary stability by distributing functional loads over a larger cortical bone surface while minimizing stress concentration at individual fixation sites.

Recent clinical studies have reported encouraging short-term outcomes for patient-specific subperiosteal implants fabricated using additive manufacturing technologies. Improved implant adaptation, reduced surgical time, and elimination of bone grafting procedures have been consistently identified as major advantages compared with conventional reconstructive approaches (9). The current evidence remains limited, consisting predominantly of case reports, case series, and a small number of cohort studies with relatively short follow-up periods. A recent systematic review including 227 patients and 227 additively manufactured subperiosteal implants reported a weighted implant survival rate of 97.8% after a mean follow-up of 21.4 months but also highlighted a relatively high incidence of soft tissue exposure and emphasized the considerable heterogeneity of the available evidence, precluding quantitative meta-analysis Therefore, robust long-term data regarding implant survival, biological complications, prosthetic maintenance, and patient-reported outcomes remain insufficient, underscoring the need for well-designed prospective clinical studies with extended follow-up.

In the present case, only a localized 3-mm soft tissue dehiscence developed around a posterior abutment during follow-up. The exposed area remained clinically stable without infection, implant mobility, or functional impairment and therefore required no additional surgical intervention. Soft tissue complications have been described as one of the most common biological events associated with subperiosteal implants, particularly in areas where mucosal thickness is limited or mechanical loading is concentrated. Careful prosthetic design, meticulous soft tissue management, and regular maintenance are therefore essential to minimize the risk of exposure and preserve peri-implant tissue health.

From a clinical perspective, patient-specific subperiosteal implants may represent a valuable treatment option for carefully selected patients with advanced maxillary atrophy who are unwilling or unsuitable to undergo extensive bone augmentation procedures. However, successful outcomes depend on accurate digital planning, precise implant manufacturing, appropriate fixation design, and close collaboration between surgeons, engineers, and prosthodontists. Although the favorable short-term outcome observed in this case supports the clinical applicability of this approach, larger prospective clinical studies with long-term follow-up are required before definitive conclusions regarding its predictability and long-term success can be established.

4. Conclusion

Patient-specific titanium subperiosteal implants fabricated through a fully digital workflow may provide a predictable graftless rehabilitation option for carefully selected patients with severe maxillary atrophy who are not suitable candidates for conventional endosseous implant placement. In the present case, digital planning, additive manufacturing, and anatomically guided fixation enabled stable implant placement and successful prosthetic rehabilitation with satisfactory functional and esthetic outcomes during the 8-month follow-up period. Although a minor localized soft tissue dehiscence was observed, it did not compromise implant stability or prosthetic function.

Nevertheless, the findings of this single case should be interpreted with caution. Further prospective studies with larger patient cohorts and longer follow-up periods are necessary to evaluate the long-term clinical performance, biological behavior, and prosthetic outcomes of patient-specific subperiosteal implants.

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SS-037

Bilateral Mandibular Torus Eksizyonunda Piezoelektrik Cerrahi: Artikülasyon ve İletişim Temelli Kaygı Üzerine Etkilerin Değerlendirildiği Olgu Sunumu ve literatür derlemesi

Özet

Amaç: Bu çalışmanın amacı, bilateral mandibular toruslu bir hastada piezoelektrik destekli cerrahi eksizyonun klinik uygulamasını sunmak ve cerrahi sonrası artikülasyon ile iletişim temelli kaygı belirtilerindeki değişimi tanımlamaktır.

Vaka Sunumu: Altmış bir yaşında, ASA I sistemik durumdaki erkek hasta, total dişsizlik nedeniyle protetik rehabilitasyon amacıyla başvurmuş olup, klinik muayenede mandibulanın lingual yüzeyinde bilateral hipertrofik toruslar saptanmıştır. Toruslara bağlı dil hareket kısıtlılığı, artikülasyon bozukluğu ve iletişim temelli anksiyete belirtileri nedeniyle hasta psikolojik olarak da değerlendirilmiş ve cerrahi eksizyon planlanmıştır. Piezoelektrik cerrahi sistemi kullanılarak gerçekleştirilen eksizyon sonrası komplikasyonsuz iyileşme sağlanmış; birinci ayda artikülasyon fonksiyonunda belirgin düzelme ve iletişim temelli kaygı düzeyinde azalma gözlenmiştir.

Sonuç: Piezoelektrik cerrahi ile gerçekleştirilen bilateral mandibular torus eksizyonu, lingual bölgede güvenli ve kontrollü osteotomi sağlayarak komplikasyonsuz iyileşme ve protetik rehabilitasyon için uygun kret formu elde edilmesine olanak tanımıştır. Cerrahi sonrası artikülasyon fonksiyonunda ve iletişim temelli anksiyete düzeyinde gözlenen iyileşme, bu yaklaşımın yalnızca cerrahi değil fonksiyonel ve psikososyal açıdan da potansiyel faydalar sağlayabileceğini düşündürmektedir.

Anahtar Kelimeler: Mandibular Torus, Anksiyete, Piezoelektrik Cerrahi

Abstract

Objective: The aim of this study is to present the clinical application of piezoelectric-assisted surgical excision in a patient with bilateral mandibular tori and to describe the postoperative changes in articulation and communication-based anxiety symptoms.

Case Report: A 61-year-old male patient with ASA I physical status presented for prosthetic rehabilitation due to total edentulism. Clinical examination revealed bilateral hypertrophic tori on the lingual aspect of the mandible. Due to restricted tongue movement, articulation disorders, and symptoms of communication-based anxiety associated with the tori, the patient underwent psychological evaluation, and surgical excision was planned. Following excision performed using a piezoelectric surgical system, uneventful healing was achieved. At the one-month follow-up, a significant improvement in articulation function and a reduction in communication-based anxiety levels were observed.

Conclusion: Bilateral mandibular torus excision performed via piezoelectric surgery allowed for a safe and controlled osteotomy in the lingual region, ensuring complication-free healing and the attainment of an appropriate

ridge form for prosthetic rehabilitation. The postoperative improvements in articulation function and communication-based anxiety levels suggest that this approach may provide potential benefits not only from a surgical standpoint but also from functional and psychosocial perspectives.

Keywords: f

1.Giriş

Ağız içi toruslar, genellikle kortikal kemiğin, nadiren ise süngerimsi kemiğin hipertrofisi sonucu gelişen benign kemik proliferasyonlarıdır (1). Mandibular toruslar tipik olarak miylohyoid çıkıntının üzerinde, lingual bölgede ve sıklıkla premolar dişler hizasında lokalizedir (2). Çoğunlukla bilateral olarak gözlenmekle birlikte unilateral olgular da bildirilmiştir (2). Literatürde mandibular torusların cinsiyete göre prevalansının farklılık göstermediğini bildiren çalışmalar bulunmakla birlikte, erkeklerde daha sık görüldüğünü ortaya koyan çalışmalar daha fazladır (3).

Mandibular toruslardan elde edilen kemik greftlerinin, normal çene kemiğinden elde edilen greftlere kıyasla daha yüksek osteojenik aktiviteye sahip olduğu bildirilmiştir (4). Klinik olarak çoğunlukla asemptomatik seyretmelerine rağmen, bazı olgularda yabancı cisim hissi, anksiyete ve obstrüktif uyku apnesi gibi semptomlara yol açabilmektedirler (5). Mandibular torusların etiyolojisi tam olarak aydınlatılamamış olup (6), mevcut veriler ısırma kuvveti ile görülme sıklığı arasında anlamlı bir ilişki olmadığını, ancak torus boyutunun artmış oklüzal kuvvetlerle ilişkili olabileceğini göstermektedir (7).

Bu çalışmanın amacı, alt total protez planlanan ve mandibular torus varlığı nedeniyle cerrahi eksizyon endikasyonu bulunan bir hastada, piezoelektrik sistem kullanılarak gerçekleştirilen eksizyonun klinik sonuçlarını sunmaktır.

2. Vaka Raporu

Altmış bir yaşında, ASA I sistemik sınıflamasına sahip erkek hasta, total dişsizlik ve sigara kullanımı nedeniyle total protez rehabilitasyonu amacıyla başvurdu. Anamnezde, mandibulanın lingual bölgesinde yaklaşık 10 yıldır mevcut olan kemik çıkıntılarının son 5 ayda hızlı büyüme gösterdiği belirtildi. Klinik muayenede kanin–premolar bölgede bilateral, ileri derecede hipertrofik mandibular toruslar saptandı (Şekil 1). Panoramik radyografide yoğun radyopasiteler izlendi. Torusların dil hareketlerini kısıtladığı, artikülasyonu bozduğu ve hastada iletişim temelli kaygı oluşturduğu gözlendi. LSAS ve PRCA-24 skorları artmış öz-farkındalık ve sosyal kaçınma ile uyumluydu.

Protetik stabilite ve fonksiyonel sorunlar nedeniyle cerrahi eksizyon planlandı. %4 artikain (1:100.000 epinefrin) ile anestezi sonrası krestal insizyon ve tam kalınlıklı flep kaldırıldı. Osteotomi piezoelektrik cerrahi ile yapıldı (Şekil 2); toruslar chisel yardımıyla tek parça çıkarıldı (Şekil 3). Alveoloplasti sonrası flep primer kapatıldı (Şekil 4). Postoperatif antibiyotik, analjezik ve gargara reçete edildi. Histopatoloji yoğun kortikal kemik ile uyumlu bulundu.

Birinci haftada komplikasyon izlenmedi. Birinci ayda artikülasyonun belirgin düzeldiği ve anksiyete düzeyinin azaldığı saptandı. Hasta protetik rehabilitasyon için yönlendirildi.

3. Tartışma

Toruslar genellikle 30 ile 50 yaşlarında ortaya çıkmaktadırlar ve erkeklerde daha çok ortaya çıkarlar (8). Hastalarda çoğunlukla tam mukoza ile kaplı olsalar da bazı olgularda mukozayı dehise edip oral ortama açılabilmektedirler (9). Sunulan olguda cinsiyet açısından literatürle benzerlik göstermektedir, ancak mukozada herhangi bir dehisens izlenmedi.

Mandibular torusların etiyolojisi tam olarak aydınlatılamamış olmakla birlikte, genetik faktörlerin yanı sıra bruksizm ve diyet alışkanlıkları gibi multifaktöriyel etkenlerin rol oynadığı düşünülmektedir (1). Bayar ve ark.'nın rapor ettiği olgu sunumunda, hastanın süt ürünlerinden zengin bir diyet alışkanlığına sahip olduğu ve buna eşlik eden şekilde kan tetkiklerinde alkalen fosfataz düzeylerinin yüksek olduğu bildirilmiştir (10). Bu bulgular, diyet alışkanlıklarının olası bir etiyolojik faktör olabileceğini düşündürmektedir. Benzer şekilde, sunulan olguda da anamnezde süt ürünleri tüketiminin yüksek olduğu ifade edilmiştir.

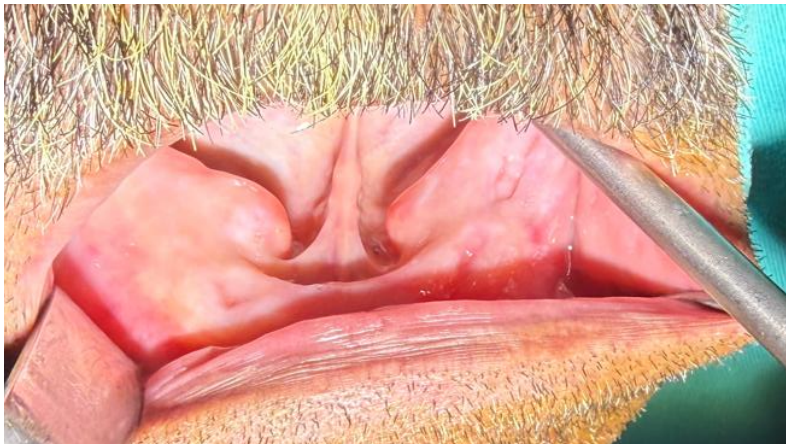
Literatürde mandibular toruslara bağlı fonasyon bozukluğu etkilediğini de belirten çalışmalar mevcut çalışmalardan biri olan Rios ve ark. 2021 yılında yayımladığı olgu sunumunda bilateral mandibular torusların konuşma fonksiyonunu etkileyebildiği ve özellikle bazı fonemlerin telaffuzunda güçlüğe yol açabildiği bildirilmiştir (11). Sunduğumuz olguda hasta aynı harfleri içeren kelimelerin telaffuzunda zorluk çekdiğini ve bu durumun sosyal kaygıya sebep olduğu bildirmektedir.

Psikolojik değerlendirme amacıyla hastaya uygulanan Liebowitz Social Anxiety Scale (LSAS) (12) ve Personal Report of Communication Apprehension (PRCA-24) (13) ölçeklerin sonuçları göz önünde bulundurarak hastanın günlük hayatında olan pozitif değişiklikler ve hastanın konuşma sırasında yaşadığı kaygı belirtilerinde klinik düzeyde azalma gözlendi.

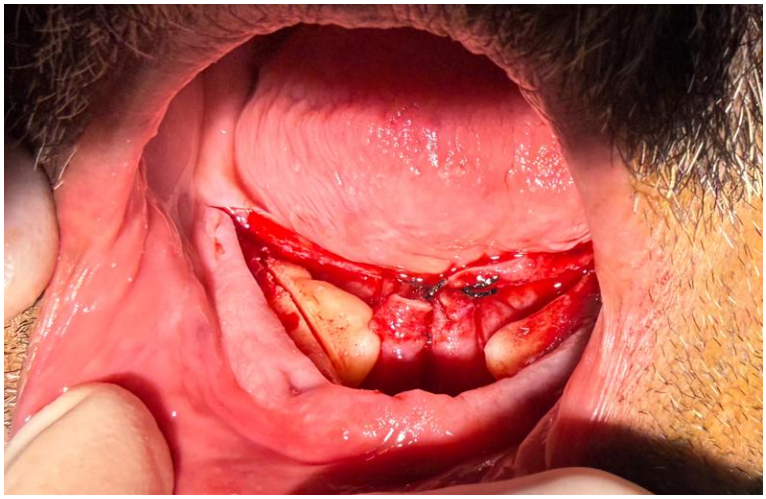
4. Sonuç

Piezoelektrik cerrahi, bilateral mandibular torus eksizyonunda özellikle lingual bölgede selektif kemik kesisi ve yumuşak doku korunumu sağlayarak cerrahi güvenliği artıran ve komplikasyon riskini azaltan etkili bir yöntemdir. Bu olguda cerrahi sonrası yalnızca uygun alveoler kret formu elde edilmemiş, aynı zamanda artikülasyon fonksiyonunda iyileşme ve iletişim temelli anksiyete düzeyinde azalma gözlenmiştir.

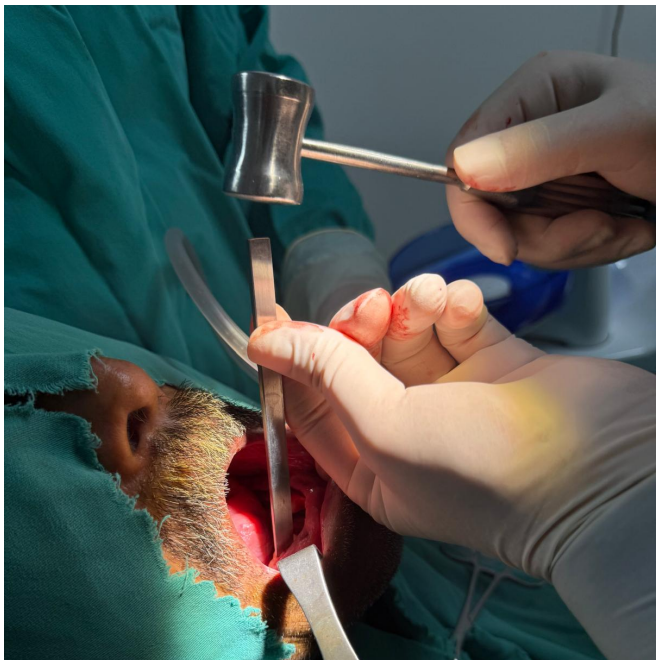
5. Figürler



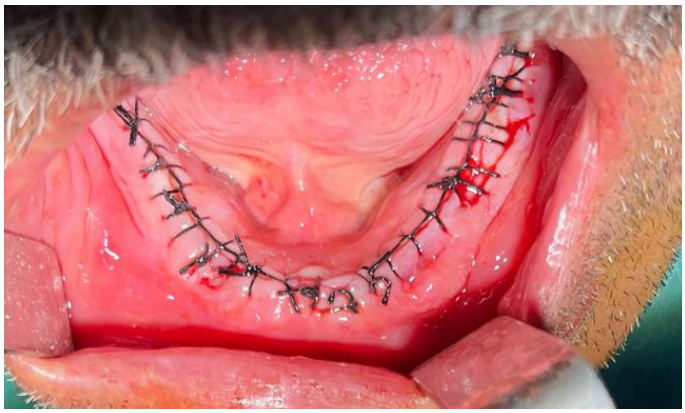
Şekil 1: Operasyon Öncesi İntraoral Görünüm



Şekil 2: Osteotomi Hattı



Şekil 3: Çekiç Yardımıyla Kontrollü Kuvvet



Şekil 4: Flepin Primer Sütürasyonu

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SS-049

IMMEDIATE IMPLANT PLACEMENT IN MEDICALLY CONTROLLED HIV-POSITIVE PATIENTS: A CASE SERIES

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Abstract

Objectives: Oral health in patients with Human Immunodeficiency Virus (HIV) Infection is frequently compromised due to the increased prevalence of dental caries and periodontal disease, often resulting in the need for extensive oral rehabilitation. This case series aimed to evaluate the clinical outcomes of immediate implant placement in medically controlled HIV-positive patients.

Case report: Six HIV-positive patients receiving highly active antiretroviral therapy (HAART) and undergoing regular medical follow-up were included in this study. Following atraumatic extraction of all maxillary and mandibular teeth, immediate implant placement was performed in the same session. Permanent fixed zirconia prostheses were delivered at the 3rd month in patients who did not require grafting or sinus lift procedures, whereas prosthetic rehabilitation was completed at the 6th month in patients undergoing grafting and/or sinus lift procedures. Successful osseointegration was achieved in all implants. Patients were followed up one year after completion of the prosthetic rehabilitation, and no implant failure or postoperative complications were observed.

Conclusion: Implant-supported rehabilitation in asymptomatic and medically controlled HIV-positive patients may achieve successful clinical outcomes comparable to those observed in patients with well-controlled systemic conditions. Immediate implant placement appears to be a predictable and viable treatment option when supported by detailed medical evaluation.

Key words: Human Immunodeficiency Virus, Immediate implant placement, Implant-supported fixed prosthesis, Osseointegration, Tooth extraction

1. Introduction

Human immunodeficiency virus (HIV) infection is a chronic viral disease that primarily targets immune cells, particularly CD4+ T lymphocytes. When untreated or inadequately controlled, progressive immunosuppression may increase susceptibility to opportunistic infections and adversely affect oral health. With the widespread use of highly active antiretroviral therapy (HAART), viral replication can be effectively suppressed, and HIV infection is now increasingly managed as a chronic, controllable systemic condition.

Oral findings associated with HIV infection include xerostomia, oral candidiasis, viral lesions, ulcerative conditions, periodontal disease, and caries-related complications. Although antiretroviral therapy has reduced the prevalence of several HIV-associated oral lesions, periodontal and other conventional oral diseases continue to require careful dental management in this population (1-3). Advanced periodontal disease, extensive caries, and impaired oral function may ultimately result in multiple tooth loss, thereby creating a need for fixed implant-supported rehabilitation.

Dental implant placement in HIV-positive patients has historically been approached with caution because of concerns regarding immunosuppression, postoperative infection, impaired wound healing, and compromised osseointegration. However, recent clinical evidence suggests that well-controlled HIV infection alone should not be considered an independent contraindication to implant therapy, provided that systemic status, viral suppression, immune parameters, oral hygiene, smoking status, and maintenance compliance are carefully assessed (4-8). Therefore, the aim of this case series was to report implant survival and postoperative complications during a one-year follow-up period after immediate implant placement and implant-supported fixed prosthetic rehabilitation in medically controlled HIV-positive patients.

2. Case Reports

This case series included six HIV-positive patients who presented for fixed oral rehabilitation because of edentulism, terminal dentition, tooth mobility, or poor dental prognosis. The diagnosis of HIV infection had previously been established by an infectious diseases clinic, and all patients were receiving HAART under regular medical follow-up. Before elective oral surgery, each patient underwent clinical and medical evaluation, and approval for dental surgical intervention was obtained from an infectious diseases specialist.

Preoperative assessment included detailed medical history, current antiretroviral regimen, systemic comorbidities and medications, dental and periodontal examination, and radiographic evaluation for implant planning. According to the presentation records, most patients were receiving second-generation integrase inhibitor-based antiretroviral regimens, particularly Bictegravir or Dolutegravir containing therapies. Patients with active opportunistic infection or inadequate medical stability were not considered candidates for elective implant surgery.

Teeth with advanced periodontal involvement, severe mobility, restorative hopelessness, or poor prognosis were extracted using an atraumatic technique. Extraction sockets were carefully curetted, and granulation tissue was removed. Immediate implants were placed in suitable maxillary and mandibular sites during the same surgical session according to prosthetically guided implant planning. Bone grafting and open sinus lifting procedures were performed when clinically indicated. Postoperative follow-up visits were scheduled at approximately 1.5- to 2-month intervals until completion of prosthetic rehabilitation.

Definitive fixed zirconia prostheses were initiated at three months in patients who did not require grafting or sinus lift procedures and after a six-month healing period in patients who underwent grafting and/or open sinus lifting. The six cases included patients aged 40 to 53 years; five patients were male and one was female. Open sinus lifting was required in two patients. Postoperative soft tissue healing was uneventful in all patients. No surgical site infection, wound dehiscence, early postoperative complication, implant failure, or peri-implant complication was observed during the one-year follow-up period after prosthetic completion.

3. Discussion

The present case series demonstrated uneventful wound healing, successful osseointegration, and no implant loss after immediate implant placement in six medically controlled HIV-positive patients. These findings support the view that, in carefully selected and medically stable patients, HIV positivity alone should not be regarded as an absolute contraindication to implant-supported fixed rehabilitation.

This observation is consistent with previous clinical studies and systematic reviews. Ata-Ali et al. reported that dental implant placement in HIV-positive patients did not increase the implant failure rate and emphasized HAART, antibiotic prophylaxis, and control of CD4+ T lymphocyte counts as important clinical considerations (4). Lemos et al. reported implant survival and success rates of 94.53% and 90.37%, respectively, at the implant level in HIV-positive patients and concluded that implant therapy may be suitable when risk factors are controlled and CD4+ counts are within an acceptable range (5). Similarly, Sivakumar et al. reported a pooled implant survival estimate of 95% in a systematic review and meta-analysis, although the overall quality of evidence was considered low (6).

In a five-year retrospective cohort study, Sabbah et al. compared 484 implants placed in HIV-positive patients with 805 implants placed in HIV-negative patients and found similar overall failure rates between the groups. Increased implant failure was associated with factors such as low CD4 percentage, protease inhibitor use, smoking, and anterior maxillary placement rather than HIV diagnosis itself (7). Likewise, Vidal et al. reported 100% implant survival in both HIV-positive and matched non-HIV control groups among well-controlled individuals receiving HAART (8). A recent overview of systematic reviews by de Aguiar et al. evaluated four systematic reviews on dental implants in HIV-positive patients and reported an overall implant success rate of 94.72%. The authors concluded that implant survival in HIV-positive patients was comparable to that reported in HIV-negative individuals and that HIV infection alone does not appear to adversely affect osseointegration (9).

The present cases differ from many previous reports in that immediate implant placement was performed in the same session as tooth extraction, and some patients also required adjunctive grafting or open sinus lifting. Despite this comprehensive surgical and prosthetic approach, no postoperative infection or implant failure was observed. This favorable short-term outcome may be related to careful patient selection, absence of active opportunistic infection, medical clearance before surgery, meticulous surgical technique, thorough socket debridement, and close postoperative follow-up.

Nevertheless, these findings should be interpreted as preliminary clinical observations rather than definitive evidence. The main limitations of this case series are the small number of patients, lack of a control group, and limited follow-up period. In addition, detailed immunological and virological laboratory parameters were not included in the present report. Further prospective controlled studies are needed to evaluate immediate implant placement, adjunctive grafting procedures, peri-implant tissue stability, marginal bone loss, and long-term implant survival in medically controlled HIV-positive patients.

4. Conclusion

Within the limitations of this case series, immediate implant placement followed by implant-supported fixed prosthetic rehabilitation showed favorable one-year follow-up findings in asymptomatic, medically controlled HIV-positive patients receiving regular antiretroviral therapy. With detailed medical evaluation, infectious diseases consultation, appropriate surgical planning, and close postoperative follow-up, immediate implant placement may be considered a viable treatment option in selected HIV-positive patients.

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SS-054

CLINICAL MANAGEMENT AND LONG-TERM FOLLOW-UP OF FIBRO-OSSEOUS LESIONS: A CASE SERIES

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ABSTRACT

INTRODUCTION: Fibro-osseous lesions are a heterogeneous group of conditions showing different biological behaviors despite similar clinical and radiological features, requiring careful evaluation in diagnosis and treatment planning. Determining the appropriate clinical approach is essential to prevent unnecessary surgical interventions and to assess lesion progression.

CASE PRESENTATIONS: Four patients (3 females, 1 male; age range: 57–87 years) were diagnosed with different fibro-osseous lesions based on clinical, radiological, and histopathological evaluations. In two patients, florid cemento-osseous dysplasia was identified; due to their asymptomatic course and lack of progression, clinical and radiographic follow-up at 6-12-month intervals was performed. In one patient, a widely distributed ossifying fibroma of the mandible was diagnosed and followed for 10 years. During follow-up, lesion progression, increased extraoral swelling, and recurrence were observed; accordingly, surgical intervention including tooth extraction and biopsy was performed in the 10th year. To support healing, low-level laser therapy (LLLT) was applied and platelet-rich fibrin (PRF) was placed at the surgical site. In another patient, fibrous dysplasia was present; the patient received treatment for osteomyelitis and was subsequently followed with clinical and radiological evaluations. Follow-up periods ranged from 2 to 10 years.

CONCLUSION: This case series shows that fibro-osseous lesions may demonstrate different clinical courses despite similar radiological appearances. Some lesions remained stable, whereas others showed progression and recurrence requiring surgical intervention. Osteomyelitis developing in fibrous dysplasia indicates that secondary infections may alter the clinical course. These findings emphasize the importance of long-term follow-up and an individualized approach based on lesion behavior.

Keywords: Fibro-osseous lesions; cemento-osseous dysplasia; long-term; follow-up.

1. INTRODUCTION

Benign fibro-osseous lesions of the jaws and craniofacial skeleton represent a heterogeneous group with similar clinical and radiological features but distinct biological behaviors, including developmental, reactive, and neoplastic entities. Diagnosis requires integration of clinical, radiographic, and histopathological findings, although characteristic clinicoradiographic features may be sufficient for diagnosing cemento-osseous dysplasia (1). This study mainly includes fibrous dysplasia, ossifying fibroma, and cemento-osseous dysplasias (2). Despite differences in pathogenesis, overlapping histopathological and radiological features often complicate differential diagnosis. Accurate identification of radiographic features is crucial to avoid unnecessary biopsies, particularly in asymptomatic cases (3). Fibrous dysplasia is a developmental lesion characterized by immature bone trabeculae within a fibrous stroma, whereas ossifying fibroma is a neoplastic lesion with a well-defined radiolucent border that is amenable to surgical enucleation, while cemento-osseous dysplasias are reactive lesions that generally require no surgical treatment (4). The aim of this study is to emphasize the importance of accurate diagnosis of fibro-osseous lesions through clinical and radiological evaluation in order to guide appropriate follow-up or surgical management and to prevent unnecessary interventions and secondary infections.

2. CASE PRESENTATIONS

2.1. Case 1

A 67-year-old female patient presented in 2022 with pain in the right mandibular posterior region. Radiographic examination showed bilaterally symmetrical sclerotic areas with surrounding radiolucent borders (Figure 1). Clinical examination revealed swelling and purulent discharge in the same region. After infection control with antibiotics, an incisional biopsy was performed, and histopathology confirmed florid cemento-osseous dysplasia. The patient was placed under follow-up after symptom resolution. In 2025, she returned with recurrent pain and swelling. The lesion was surgically treated by enucleation and curettage. Healing was uneventful, and the patient remains under regular follow-up.

2.2. Case 2

An 87-year-old female patient presented in 2018 for routine examination. Radiological findings revealed widespread fibro-osseous lesions around mandibular teeth and in the bilateral maxillary third molar regions (Figure 2). As the patient was asymptomatic and elderly, surgery and biopsy were avoided, and regular follow-up was recommended. In 2021, the patient presented with pain, swelling, and purulent discharge in the left mandible. Teeth 37 and 38 were extracted as potential sources of infection, followed by enucleation and biopsy of the lesion. Histopathological examination confirmed florid cemento-osseous dysplasia. Healing was uneventful, and the patient remains under follow-up.

2.3. Case 3

A 57-year-old female patient presented in 2015 for a routine examination. Radiological assessment revealed widespread fibro-osseous lesions involving both dentate and edentulous regions of the mandible (Figure 3). As the patient was asymptomatic, she was informed about the findings and placed under periodic clinical and radiological follow-up. In 2017, the patient was admitted to our clinic with complaints of swelling and acute pain in the left posterior edentulous mandibular region. The lesion was surgically enucleated, and histopathological evaluation confirmed the diagnosis of cemento-ossifying fibroma. As the patient declined additional surgical intervention in the absence of symptoms, the remaining lesions were managed conservatively, and a close follow-up protocol was maintained. In 2026, following long-term surveillance, the patient presented again with pain, swelling, and purulent discharge in the region of tooth 37. Clinical and radiological examinations demonstrated progression of the fibro-osseous lesion in the periapical region of the affected tooth. The tooth was extracted under antibiotic coverage, and the associated lesion was excised. Histopathological findings were consistent with ossifying fibroma. In the postoperative period, low-level laser therapy was administered to manage surgery-related paresthesia, resulting in complete resolution of symptoms. The patient remains under continuous follow-up.

2.4. Case 4

A 66-year-old male patient presented in 2018 with pain, swelling, and intermittent purulent discharge in the right maxillary region. Cone-beam computed tomography showed a “ground-glass” appearance consistent with fibrous dysplasia, along with irregular radiolucent areas and sequestration (Figure 4). Based on these findings, a diagnosis of osteomyelitis associated with fibrous dysplasia was made. Necrotic bone and sequestra were removed under local anesthesia, and sequestrectomy with debridement was performed. Histopathological findings supported the diagnosis. The infection was successfully controlled after treatment. At the 2025 follow-up, there was no clinical or radiographic evidence of recurrent osteomyelitis, and the underlying fibrous dysplasia remained stable.

3. DISCUSSION

Cemento-osseous dysplasias (COD), the most common fibro-osseous lesions of the jaws, pose diagnostic challenges because of their overlapping clinical and radiographic features with other pathologies (5). This diagnostic overlap may lead to misdiagnosis, suboptimal management, and subsequent clinical complications (6). Management generally involves observation in asymptomatic cases, whereas surgical intervention is reserved for symptomatic or infected lesions. Yin et al. reported that COD is frequently misdiagnosed, often resulting in unnecessary surgical procedures (7). Therefore, accurate interpretation of advanced imaging modalities, particularly CBCT, is critical. The World Health Organization (WHO) recommends that COD be diagnosed primarily based on imaging findings and that biopsy be avoided whenever possible (8,9).

Olgaç et al. (2021) emphasized that successful COD management depends on balancing surgical intervention and conservative follow-up (10). Due to limited vascularization, unnecessary surgery may increase the risk of complications and osteomyelitis, whereas observation alone may delay treatment in progressive or symptomatic cases. Once secondary osteomyelitis develops, management becomes more challenging, and antibiotic therapy alone is often insufficient (10). Therefore, surgery should be reserved for symptomatic or progressive lesions, while asymptomatic cases should be managed with regular clinical and radiological follow-up and good oral hygiene. In the present study, long-term follow-up demonstrated heterogeneous lesion behavior; some lesions remained stable, whereas others progressed or recurred, requiring surgical treatment. These findings emphasize that management decisions should be continuously reassessed based on longitudinal clinical and radiological findings. Malignant transformation of fibro-osseous lesions is rare, mainly associated with fibrous dysplasia and exceptionally uncommon in COD (11,12). In patients with a history of malignancy, metastatic lesions may mimic COD radiographically; therefore, histopathological confirmation is recommended in cases presenting with suspicious clinical findings (13). Overall, fibro-osseous lesions require individualized management based on clinical findings, radiological features, infection risk, and biological behavior. Avoiding unnecessary surgery and performing timely intervention when indicated are crucial for optimal outcomes.

4.CONCLUSION

Fibro-osseous lesions of the jaws comprise biologically distinct entities that may exhibit overlapping clinicoradiographic and histopathological features. This case series illustrates that management should be individualized according to the diagnosis, symptoms, radiographic evolution, and presence of secondary infection. Although asymptomatic lesions with characteristic features may be managed conservatively, the development of pain, swelling, infection, or progressive enlargement may necessitate surgical intervention. Long-term clinical and radiographic surveillance is therefore essential for detecting changes in lesion behavior and determining the appropriate timing of treatment.

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Figure 1: Case 1 – Florid cemento-osseous dysplasia. An infected fibrotic lesion located in the left mandibular edentulous region.

Figure 2 : Case 2 – Florid cemento-osseous dysplasia. Teeth 37 and 38 became symptomatic four years later.

Figure 3 : Case 3 – Capsul ossifying fibroma surrounding tooth 37.

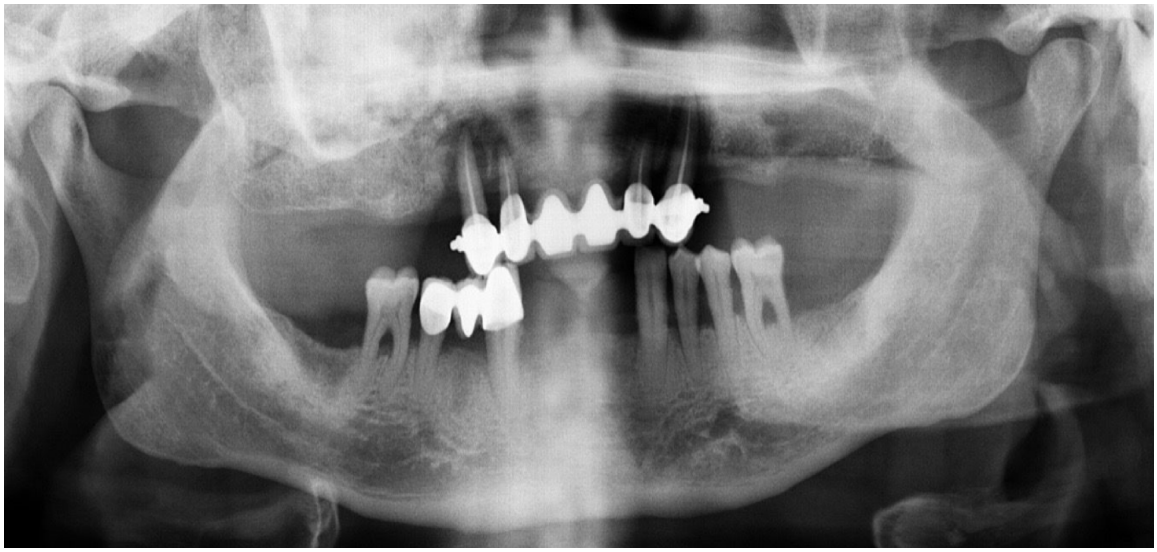

Figure 4 : Case 4 – An ill-defined ground-glass appearance in the right maxillary region.

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RISK-BASED MANAGEMENT OF MANDIBULAR TRAUMATIC BONE CYSTS: A CASE SERIES AND LITERATURE REVIEW

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Objective: Traumatic bone cysts (TBCs) are rare pseudocystic lesions of the jaws that lack an epithelial lining. Their etiopathogenesis remains unclear. This case series aimed to describe different management strategies for nine mandibular TBCs and to propose a practical risk-oriented clinical framework based on diagnostic confidence, lesion extent, cortical integrity, mechanical stability, and patient-related factors.

Case Presentation: This case series included nine patients aged 12–37 years, predominantly adolescents and young adults. Management strategies were determined according to lesion size, cortical bone condition, relationship with third molars, patient compliance, and surgical anxiety. In surgically treated cases, exploration, bone window/osteotomy, curettage, platelet-rich fibrin (PRF), and collagen cavity support materials were used. Histopathological findings, including non-epithelialized fibrous tissue, blood clots, and bone fragments, were consistent with TBC. Additionally, studies published in the PubMed database between 2000 and 2026 were reviewed using the keywords “traumatic bone cyst”, “simple bone cyst” and “idiopathic bone cavity”. Clinical outcomes were compared with previous case series regarding treatment approaches, radiographic bone healing, recurrence, and complications.

Conclusion: Management of TBCs should focus on structural integrity rather than lesion presence alone. Active surveillance may be sufficient in small lesions, whereas prophylactic plating may be critical in extensive defects to prevent pathological fractures. This series highlights the importance of individualized management based on clinical and radiological risk assessment.

Keywords: idiopathic bone cavity, simple bone cyst, traumatic bone cyst

1. Introduction

Traumatic bone cysts (TBCs) are rare intraosseous pseudocystic lesions that lack an epithelial lining and may be empty or contain small amounts of serous or sanguineous fluid. They occur predominantly in young individuals, most commonly during the second decade of life. TBCs are more frequently observed in the mandible, particularly in the posterior region. As they are usually asymptomatic, they are most often detected incidentally during routine radiographic examinations (1,2).

Radiographically, TBCs usually present as well-defined, predominantly unilocular radiolucencies, frequently showing scalloping between the roots of vital teeth. Nevertheless, their appearance may overlap with odontogenic cysts, benign tumors, and other intraosseous lesions; therefore, diagnosis often relies on the combined interpretation of clinical, radiographic, surgical, and histopathological findings (3).

Although several theories have been proposed regarding the etiology of traumatic bone cysts, their pathogenesis remains unclear. Trauma, vascular abnormalities, and neoplastic processes have all been suggested as possible etiological factors; however, no definitive mechanism has been established (4).

The standard treatment for traumatic bone cysts consists of surgical exploration of the cavity followed by curettage of the bony walls to induce bleeding. In selected cases, the cavity may also be filled with platelet-rich fibrin (PRF), bone graft materials, or collagen sponges to promote bone regeneration (5,6) .

Although surgical exploration and curettage remain the most frequently used approach, observation has also been described for small, asymptomatic, and radiographically characteristic lesions. Conversely, extensive lesions with marked cortical thinning may require additional measures to preserve mandibular stability (7–9).

The aim of this case series was to describe the clinical and radiographic characteristics, management strategies, and follow-up outcomes of nine mandibular TBCs and to propose a practical risk-oriented clinical framework for selecting among active surveillance, surgical exploration and curettage, and adjunctive mandibular stabilization.

2. Case Presentation

This case series comprised nine patients with mandibular lesions managed surgically or by active radiographic surveillance. Seven surgically explored lesions were diagnosed as TBCs based on the combined clinical, radiographic, intraoperative, and available histopathological findings, whereas the two conservatively managed lesions were regarded as presumed TBCs based on their characteristic radiographic appearance, vitality of the associated teeth, clinical stability, and absence of radiographic progression. The patients ranged in age from 12 to 37 years, with a mean age of 18 years, and were predominantly adolescents and young adults. Most lesions were asymptomatic and were detected incidentally during routine radiographic examinations. All patients presented with a solitary lesion in the mandible, and all associated teeth were vital. The lesion was located in the posterior region in six cases, the anterior region in two cases, and the premolar region in one case. Treatment strategies were determined according to lesion size, cortical bone integrity, patient compliance, and the patient's level of anxiety regarding surgery. Of the nine patients, six underwent conventional surgical exploration and curettage, one underwent exploration and curettage with repositioning and miniplate fixation of the cortical window, and two were managed by active radiographic surveillance.

Among the six patients treated with conventional surgical exploration and curettage, five demonstrated satisfactory progressive bone fill during radiographic follow-up (Figure 1). In one patient, however, a panoramic radiograph obtained 6 months postoperatively demonstrated little reduction in lesion size. Subsequent cone-beam computed tomography (CBCT) revealed complete healing of the cortical window but no evidence of bone regeneration within the cavity. As the 16-year-old patient declined further surgical intervention, clinical and radiographic follow-up is ongoing (Figure 2).

In one case, a 23-year-old male presented with a large lesion involving the posterior mandible that was considered to be at risk of pathological fracture. A cortical bone window was created for surgical exploration, and the cavity was curetted. As no additional pathological findings were identified, the cortical bone window was repositioned and stabilized with a miniplate to preserve mandibular integrity (Figure 3).

In two cases, conservative management with periodic radiographic follow-up was chosen because of the small lesion size and the patients' significant anxiety regarding surgery. Throughout the follow-up period, the associated teeth remained vital, the lesions showed no evidence of progression, and no complications developed.

Accordingly, the cases were clinically grouped according to their structural and diagnostic risk. Two small, asymptomatic lesions with preserved cortical integrity, vital associated teeth, and no radiographic progression were considered low risk and were managed by active surveillance; surgical anxiety influenced the final decision only after the lesions had been judged structurally suitable for observation and reliable follow-up had been ensured. Six lesions were considered intermediate risk because surgical confirmation of the diagnosis and/or induction of intraosseous bleeding was required, and these lesions were managed by exploration and curettage. Intraoperative findings consisted of empty or sparsely occupied cavities containing variable amounts of blood clot, non-epithelialized fibrous tissue, and bone fragments; PRF and collagen cavity-support materials were used selectively. One extensive posterior mandibular lesion with pronounced cortical thinning was considered mechanically high risk; following exploration and curettage, the cortical window was repositioned and stabilized with a miniplate to preserve mandibular continuity and reduce susceptibility to pathological fracture. (Table 1)

3. Discussion

In our study, the patients had a mean age of 18 years, were predominantly male, and most lesions were asymptomatic. These findings are consistent with previous reports indicating that traumatic bone cysts are most often detected incidentally during routine radiographic examinations. Although our study included only mandibular traumatic bone cysts, the literature indicates that these lesions occur predominantly in the mandible and are typically unilocular and unifocal. Nevertheless, multilocular lesions and multiple lesions occurring within the same jaw have also been reported (10–12).

In most cases, surgical exploration followed by curettage was performed to confirm the diagnosis and initiate treatment. Surgical exploration serves a dual role in TBCs: it supports the diagnosis by demonstrating an empty or sparsely occupied intraosseous cavity without an epithelial lining and induces bleeding from the bony walls to initiate clot formation and subsequent osseous healing. Therefore, exploration and curettage remain the most frequently applied approach, particularly when the radiographic diagnosis is uncertain or stimulation of intraosseous bone healing is required (5,13,14). The principal distinction of the present series was the use of adjunctive stabilization in an extensive posterior mandibular lesion considered mechanically vulnerable. In such cases, the clinical problem is not limited to the presence of a pseudocystic cavity; marked loss of cortical support and weakening of the inferior mandibular border may increase susceptibility to pathological fracture (7,15) . Repositioning and fixation of the cortical window may preserve mandibular contour, protect the weakened bone during healing, and avoid creating an additional structural defect. Nevertheless, prophylactic plating should be regarded as a case-dependent option for mechanically compromised lesions rather than a routine component of TBC treatment. Conversely, two patients in our series were managed by active surveillance after their lesions had been judged radiographically characteristic and structurally low risk. Observation should not be interpreted as a universal alternative to surgery. It may be considered when the lesion is small and asymptomatic, associated teeth

are vital, cortical integrity and the inferior mandibular border are preserved, no progression is evident, and reliable long-term follow-up can be ensured. In the present cases, surgical anxiety influenced the final patient preference but was not, by itself, considered sufficient justification for observation. Both lesions remained stable without clinical or radiographic complications. Previous studies have also documented spontaneous resolution or gradual remodelling during prolonged observation (7–9,13,15)

In one patient, the absence of substantial intraosseous bone fill at the 6-month evaluation was interpreted as delayed or incomplete radiographic healing rather than definitive persistence or recurrence, particularly because the cortical access window had healed and no clinical or radiographic progression was observed. Although re-exploration may be considered when a lesion enlarges, becomes symptomatic, or remains diagnostically uncertain, the absence of marked trabecular regeneration at 6 months alone may be insufficient to define treatment failure. Suei et al. reported that radiographic healing was commonly confirmed after approximately 12–17 months and could require longer follow-up in some patients, whereas Resnick et al. demonstrated that radiographic resolution may remain incomplete even after prolonged observation (14,16) .Among the surgically treated lesions that achieved radiographic healing, no subsequent radiographic reappearance was observed during follow-up periods ranging from 2 to 5 years. One additional lesion showed delayed or incomplete bone fill without progressive enlargement. Nevertheless, long-term outcome studies indicate that multiple lesions may demonstrate less favorable healing than solitary lesions and that multilocular lesions may behave less predictably than unilocular lesions. Bilateral involvement and association with cemento-osseous dysplasia have also been linked to persistent or relapsing radiographic behavior, supporting the need for prolonged surveillance in these presentations (11,16–20) .Drawing on the management patterns observed in the present series and previous reports supporting both spontaneous resolution in carefully selected lesions and surgical exploration when diagnostic confirmation or stimulation of bone healing is required, we propose a practical risk-oriented clinical framework. The framework first considers diagnostic confidence and then evaluates structural integrity, lesion behavior, and the feasibility of reliable follow-up. It is intended to guide clinical reasoning rather than to represent a validated treatment algorithm(7–9,13–17) .The proposed framework is summarized in Table 2.

According to this framework, active surveillance is reserved for radiographically characteristic and structurally low-risk lesions in patients who can reliably attend long-term follow-up. Surgical exploration and curettage are preferred when diagnostic confirmation is required, when radiographic behavior is uncertain, or when stimulation of intraosseous healing is considered necessary. In extensive lesions with substantial cortical compromise, adjunctive stabilization may be considered to protect mandibular continuity during healing. Multiple, multilocular, bilateral, recurrent, or cemento-osseous dysplasia–associated lesions warrant prolonged surveillance because of their less predictable behavior. Importantly, these categories are intended to support individualized clinical judgment and should not be interpreted as rigid treatment thresholds.

This case series has several limitations. The number of patients was limited, follow-up durations were not uniform, and healing was assessed primarily through conventional radiographic interpretation rather than standardized volumetric measurements. Furthermore, the two lesions managed conservatively lacked surgical and histopathological confirmation and should therefore be regarded as presumed TBCs. The proposed risk-oriented framework reflects the clinical management of this series and requires validation in larger cohorts with

standardized imaging and long-term follow-up. Nevertheless, the inclusion of observation, conventional curettage, delayed healing, and adjunctive stabilization within the same series provides a clinically instructive overview of different management scenarios.

4. Conclusion

Mandibular traumatic bone cysts do not require an identical management strategy in every patient. Small, radiographically stable lesions with preserved cortical integrity may be followed in carefully selected and compliant patients, whereas surgical exploration and curettage remain appropriate when diagnostic confirmation or stimulation of bone healing is required. In extensive lesions with marked cortical thinning or potential compromise of mandibular continuity, adjunctive stabilization may be considered to reduce mechanical risk. Management should therefore be individualized according to lesion extent, structural integrity, diagnostic certainty, patient-related factors, and the feasibility of long-term follow-up.

5. References

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The Effect of Low-Level Laser Therapy on Clinical Healing in Patients with Osteomyelitis: A Case Series

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Abstract

Objective: This study aimed to evaluate the potential effects of low-level laser therapy (photobiomodulation) on the clinical healing outcomes of patients diagnosed with osteomyelitis.

Case Report: Four patients diagnosed with mandibular osteomyelitis (2 male, 2 female) were included. All patients received standard treatment (antibiotic therapy, local irrigation) combined with LLLT. Clinical outcomes were assessed based on pain, inflammation, paresthesia/hypoesthesia, fistula presence, and radiological findings. All patients showed reduced pain, improved soft tissue healing, decreased infection signs, and regression of neurosensory deficits. Radiological findings supported bone healing. No major complications were observed.

Conclusion: LLLT shows potential for improving clinical outcome of surgical and medical treatment of osteomyelitis of the jaws. Further controlled studies with larger samples are needed.

Keywords: Osteomyelitis, low-level laser therapy, photobiomodulation

1. Introduction

Osteomyelitis is an inflammatory disorder involving the bone marrow, cortical bone, and periosteal tissues (1). Although its incidence has declined with the widespread use of antibiotics, mandibular osteomyelitis remains a therapeutic challenge because of the mandible's limited vascularity (2,3). Systemic antibiotic therapy remains the cornerstone of treatment; however, advanced cases often require surgical intervention to achieve disease control (4). As treatment outcomes remain unpredictable, particularly in chronic and refractory disease, increasing attention has been directed toward adjunctive therapies that promote tissue repair and improve clinical outcomes.

Photobiomodulation therapy (PBMT), also known as low-level laser therapy (LLLT), is a promising treatment modality with anti-inflammatory, analgesic, and regenerative properties. PBMT uses wavelengths ranging from 600 to 1,000 nm and may promote tissue repair by stimulating cellular

activity,enhancing bone regeneration and angiogenesis, and modulating inflammatory responses. These effects suggest a potential adjunctive role in the management of osteomyelitis (5–7).

This case series aimed to describe the clinical and radiographic outcomes of four patient with mandibular osteomyelitis treated with conventional therapy and adjunctive LLLT.

In our cases, following initial infection control achieved through antibiotic therapy and irrigation, laser therapy (650 nm and 904 nm, GRR device) was administered daily for the first 10 days, followed by three sessions per week for a minimum of 40 sessions, with each session lasting 10 minutes.

2. Case Reports

Case 1: A 45-year-old male patient with a history of lymphoma, diagnosed 37 years previously and treated with radiotherapy to the head and neck region, had undergone extraction of a mandibular posterior tooth 20 years earlier. An asymptomatic lesion involving the mandibular canal had remained at the extraction site. Following the removal of a retained root located within the mucosa anterior to the previous extraction area, the patient developed lower lip paresthesia accompanied by inflammatory changes in the region of the pre-existing lesion. Based on the clinical and radiographic findings, a diagnosis of chronic osteomyelitis was established. The patient was managed with a combination of systemic antibiotic therapy and low-level laser therapy (LLLT) and was followed for 12 months. A total of 120 LLLT sessions were administered during the treatment period. Progressive clinical improvement was observed, with complete resolution of inflammatory signs and symptoms as well as full recovery of lower lip sensation by the end of follow-up.

Case 2: A 44-year-old male patient presented to our clinic with complaints of swelling and persistent infection one month following the extraction of tooth #48. The patient reported having received systemic antibiotic therapy during this period without clinical improvement. Based on the clinical and radiographic findings, a diagnosis of chronic osteomyelitis was established. The patient was treated with low-level laser therapy (LLLT). Marked clinical improvement, including a substantial reduction in pain, swelling, and signs of infection, was observed within three days of initiating treatment. Following a total of 25 LLLT sessions, spontaneous sequestration of the necrotic bone occurred, and satisfactory clinical healing was achieved.

Case 3: A 37-year-old female patient presented to our clinic with complaints of pain and swelling following the extraction of tooth #48. Clinical and panoramic radiographic examination revealed ill-defined mandibular borders in the affected region, accompanied by bone sequestration,

consistent with a diagnosis of chronic osteomyelitis. The patient was treated with low-level laser therapy (LLLT).

Case 4: A 61-year-old female patient presented to our clinic with complaints of pain, swelling, and purulent discharge following the extraction of teeth #41 and #42. Based on the clinical and radiographic findings, a diagnosis of chronic osteomyelitis was established. The patient was treated with low-level laser therapy (LLLT).

Throughout the follow-up period, all patients showed minimal spontaneous sequestration, symptom resolution, and complete mucosal healing, as confirmed by clinical and radiographic evaluations.

3. Discussion

Mandibular osteomyelitis may require various surgical approaches. While decortication can be effective in localized cases, advanced disease with rapid progression, inferior alveolar nerve paresthesia, or pathological fracture often requires more extensive intervention. Due to limited antibiotic penetration into necrotic bone, complete removal of infected and necrotic tissue remains essential, as conservative treatments may be insufficient (8).

Advances in imaging modalities have improved the evaluation of mandibular osteomyelitis and enabled more accurate surgical planning. In extensive cases, segmental resection may provide better disease control; a recent study reported recurrence in three of six patients after marginal resection compared with one of eighteen patients after segmental resection (2).

Despite the role of surgery, evidence suggests that single treatment modalities may be insufficient for complete lesion resolution. Therefore, adjunctive therapies have gained attention to enhance tissue repair, control inflammation, and improve clinical outcomes (9,10).

Low-level laser therapy (LLLT), is a promising adjunctive treatment modality. Red and near-infrared wavelengths (630–850 nm) have demonstrated favorable biological effects, primarily through mitochondrial cytochrome c oxidase activation, resulting in increased ATP production, enhanced collagen synthesis, angiogenesis, modulation of inflammation, and accelerated tissue repair (11,12).

Although surgery is considered the standard treatment for chronic osteomyelitis (2), none of the patients in this case series underwent surgical intervention. LLLT, which is generally described as an adjunctive therapy, was used as the primary treatment approach in combination with systemic antibiotics. No recurrence was observed during follow-up despite the reported risk of recurrence after

surgical treatment. These findings suggest that LLLT may represent a promising non-surgical alternative for selected patients with chronic osteomyelitis; however, further studies with larger cohorts and longer follow-up are required.

4. Conclusion

The findings of this case series suggest that low-level laser therapy (LLLT), when applied as an adjunctive modality to conventional treatment approaches in patients with osteomyelitis, may contribute to the control of inflammation, regression of clinical symptoms, and promotion of tissue healing. All patients underwent panoramic radiography, received systemic antibiotics and adjunctive LLLT, and were followed clinically until complete mucosal healing.As a noninvasive and safe therapeutic modality, photobiomodulation therapy (LLLT) may represent a promising approach in the management of osteomyelitis of the jaws.

Kaynakça

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5. Figures

Figure 1 : Pre-extract)on panoram)c rad)ograph (case 1)

Figures 2: After 120 sess)ons of low-level laser therapy (LLLT). (case 1)

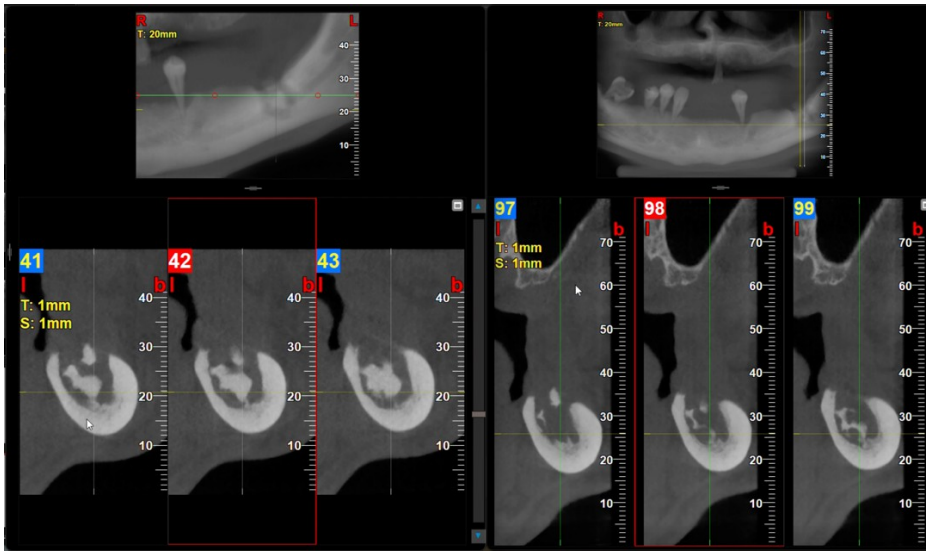

Figure 3 : İn)t)al CBCT)mage and follow-up CBCT)mage after 120 sess)ons of low-level laser therapy (LLLT). (case 1)

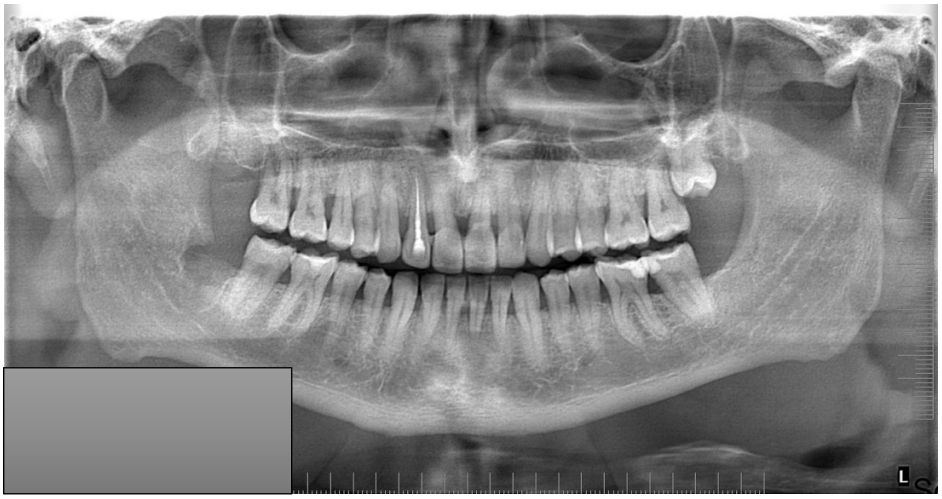

Figure 4 : Extract)on socket of tooth #48, one month after extract)on. (case 2)

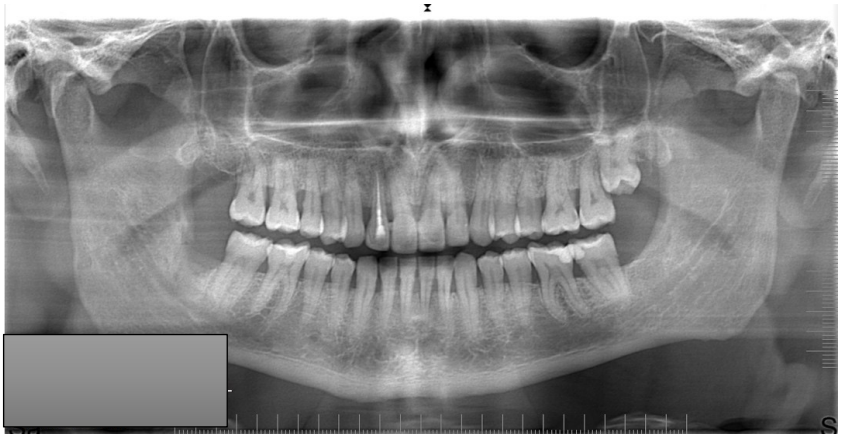

Figure 5: Extract)on socket of tooth #48, s)x months after extract)on. (case 2)

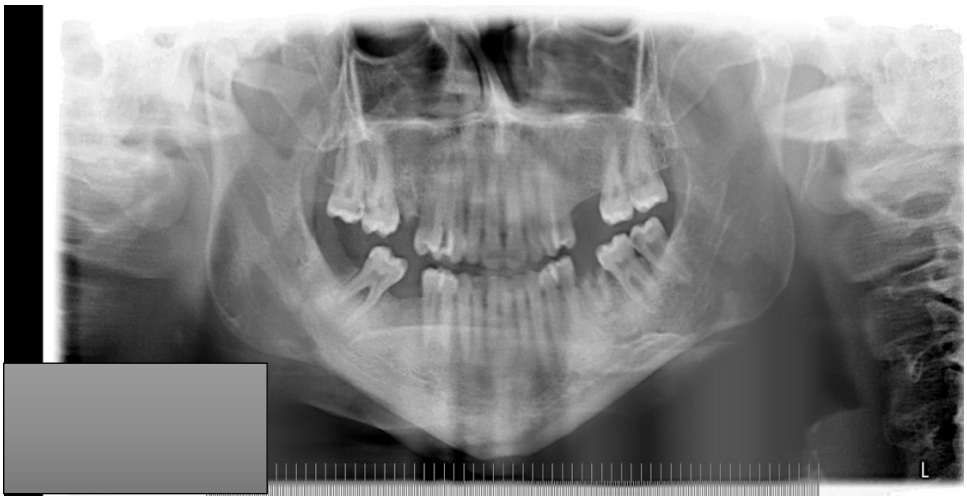

Figure 6: Extract)on socket of tooth #48, one month after extract)on. (case 3)

Figure 7 : Extract)on socket of tooth #48, three months after extract)on. (case 3)

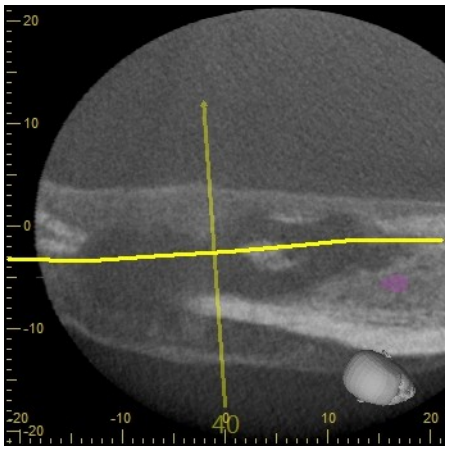

Figure 8: Bone sequestrat)on)n the reg)on of tooth #48. (case 3)

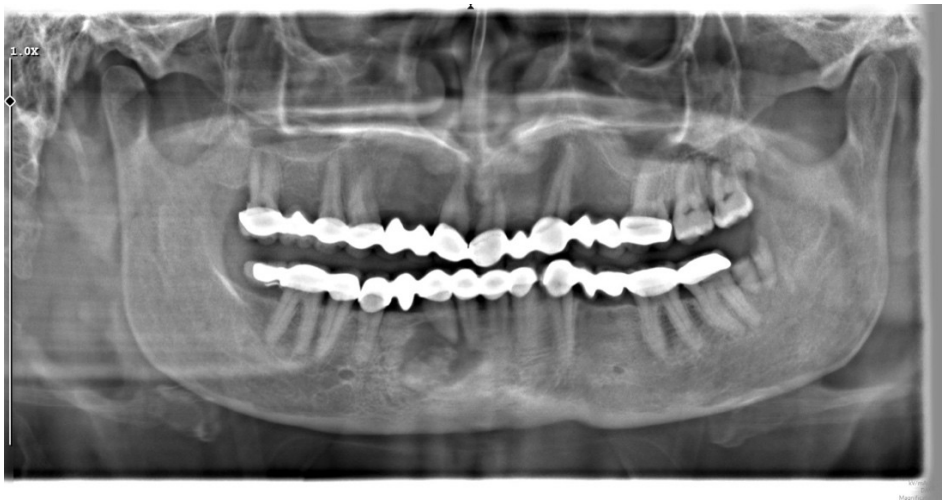

Figure 9: Pre-extract)on panoram)c rad)ograph of teeth #41 and #42.. (case 4)

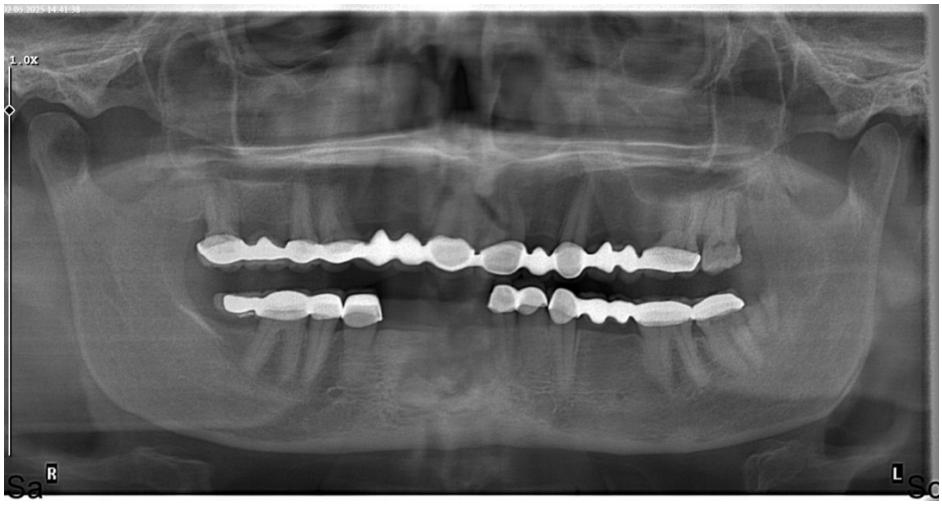

Figure 10: Post-extract)on panoram)c rad)ograph of teeth #41 and #42.. (case 4)

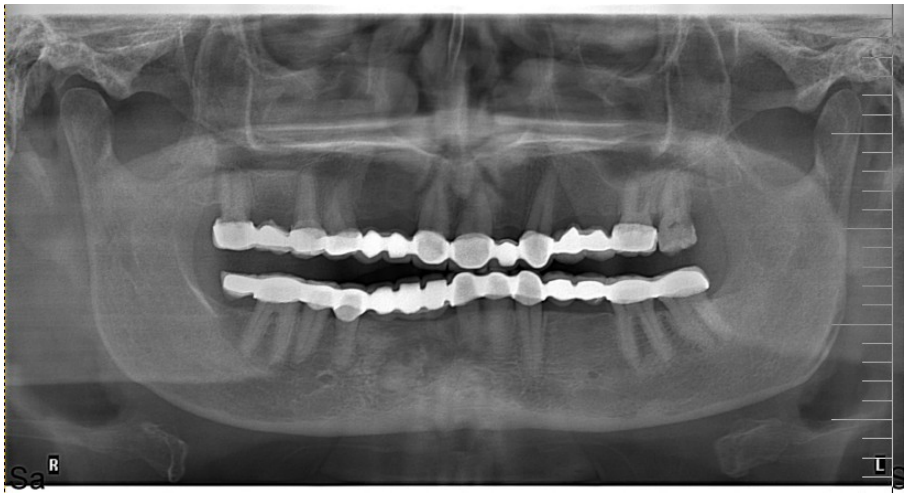

Figure 11: Post-extract)on panoram)c rad)ograph of teeth #41 and #42. After f)ve months. (case 4)

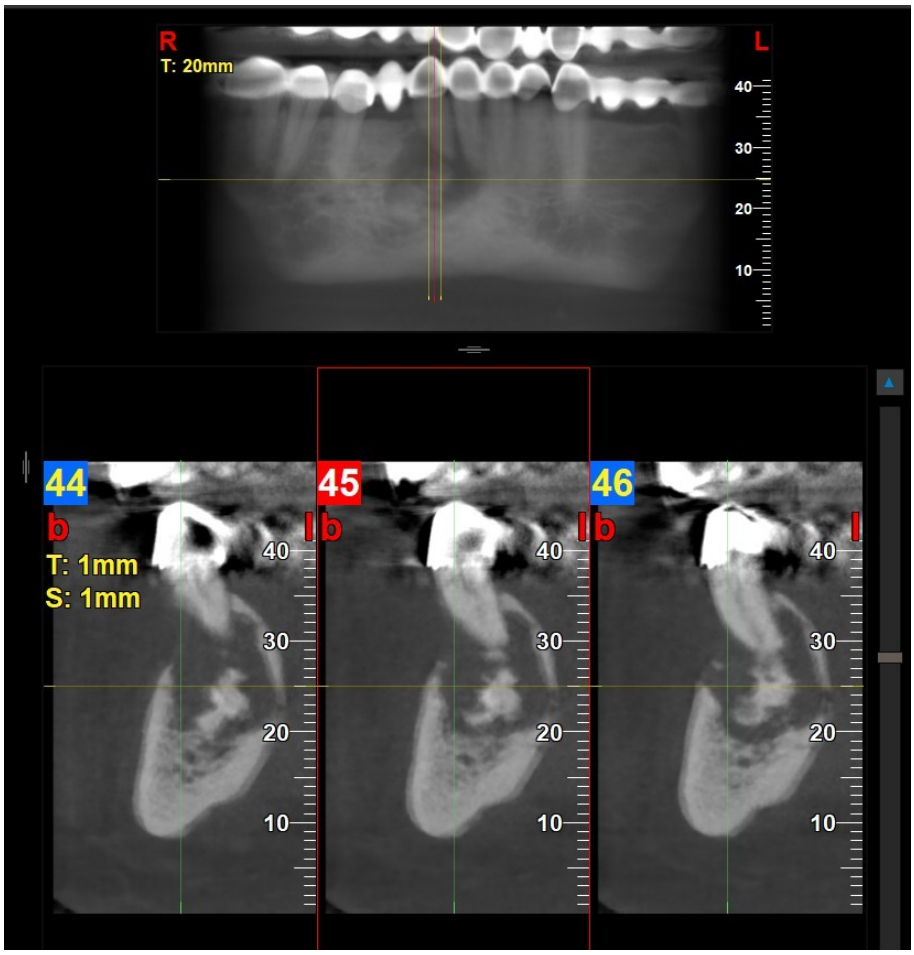

Figure 12: Bone sequestrat)on on a CBCT sect)on. (case 4)

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TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
33. ULUSLARARASI BİLİMSEL KONGRESİ
16-18 Haziran 2026, Grand Cevahir Hotel - İstanbul

SS-062

Maksiller Sinüs Semento-Ossifiye Fibromlarında Kombine Endoskopik Medial Maksillektomi ve Caldwell–Luc Yaklaşımı: İki Olgu Sunumu

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GİRİŞ: Semento-ossifiye fibroma (SOF), periodontal ligament kökenli, benign ancak ekspansif büyüme gösterebilen nadir bir fibroosseöz neoplazmdır. Mandibulada daha sık gözlenirken, maksiller sinüs ve sinonazal bölgedeki yerleşimi daha nadirdir. Bu çalışmada, odontojenik kökenli olduğu düşünülen ve maksiller sinüsü tutan iki SOF olgusunun cerrahi yönetimi sunulmuş ve literatür eşliğinde tartışılmıştır.

VAKA SUNUMU: Maksiller sinüs yerleşimli, histopatolojik olarak SOF tanısı alan iki hasta retrospektif olarak değerlendirildi. Hastaların klinik ile radyolojik bulguları analiz edildi; cerrahi yaklaşım ve postoperatif sonuçları değerlendirildi.

Olgu 1: Otuz-bir yaşında erkek hasta burun tıkanıklığı şikâyeti ile başvurdu. Görüntülemede sol maksiller sinüsü dolduran ve tüm duvarlarında yer yer incelmelere neden olan, nazal kaviteye doğru uzanım gösteren 42 x 51 mm boyutunda kitle lezyonu izlendi. Rezeksiyona endoskopik medial maksillektomi ile başlandı ancak lezyonun sinüs duvarlarına yapışık olması nedeniyle Caldwell – Luc yaklaşımı ile operasyona devam edildi. 26 numaralı diş kitle içerisinden çıkarıldı. Kitle piecemeal olarak ve osseöz kapsülü ile birlikte total eksize edildi. Histopatolojik inceleme sonucu SOF olarak raporlanan hastanın postoperatif 3. ayında nüks saptanmadı.

Olgu 2: Yirmi-bir yaşında erkek hasta sol yanak üzerinde ağrı şikâyeti ile başvurdu. Hastanın 2015 yılında ossifiye fibroma nedeniyle dış merkezde Caldwell–Luc yaklaşımı ile opere edildiği ancak kitlenin total eksize edilmediği öğrenildi. Görüntülemelerinde sol maksiller sinüs tabanına oturan 37x42 mm boyutunda, multiseptalı ekspansif solid lezyon izlendi.

Endoskopik medial maksillektomi ve Caldwell–Luc ile kitle piecemeal şeklinde total eksize edildi. Lezyon ile ilişkili 23, 25 ve 27 numaralı dişler çekildi ve oluşan oroantral fistül Bichat yağ flebi ile onarıldı. Histopatoloji sonucu SOF olarak raporlanan hastanın postoperatif 2. ayında nüks saptanmadı.

SONUÇ: SOF, maksiller sinüs yerleşiminde nadir görülmekle birlikte, geniş lezyonlarda radyolojik olarak agresif tümörleri taklit edebilir. Literatürde bildirildiği üzere, maksiller sinüsün lateral, inferior ve anterior duvarlarını tutan büyük lezyonlarda yalnızca endoskopik yaklaşım yetersiz kalabilmektedir. Bu tür olgularda kombine endoskopik medial maksillektomi ve Caldwell–Luc yaklaşımı, tüm sinüs duvarlarına erişim sağlayarak tam eksizyonu mümkün kılmaktadır.

Anahtar Kelimeler: Caldwell–Luc, endoskopik medial maksillektomi, fibroosseöz lezyon, maksiller sinüs, odontojenik tümör, semento-ossifiye fibroma

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Combined Endoscopic Medial Maxillectomy and Caldwell–Luc Approach in Maxillary Sinus Cemento-Ossifying Fibromas: A Report of Two Cases

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OBJECTIVE: Cemento-ossifying fibroma (COF) is a rare, benign but expansile fibro-osseous neoplasm originating from the periodontal ligament. While more common in the mandible, its localization in the maxillary sinus and sinonasal region is rare. This study presents and discusses the surgical management of cases of COF involving the maxillary sinus, likely of odontogenic origin, in light of the literature.

CASE PRESENTATION: Two patients diagnosed histopathologically with COF of the maxillary sinus were evaluated regarding clinical and radiological findings, surgical approaches, and postoperative outcomes.

Case 1: A 31-year-old male presented with nasal obstruction. Imaging revealed a 42 × 51 mm mass filling the left maxillary sinus, causing thinning of the sinus walls and extending into the nasal cavity. Resection was initiated via endoscopic medial maxillectomy; however, due to firm adhesions to the sinus walls, the procedure was continued with a Caldwell–Luc approach. Tooth number 26 was removed from within the mass. The lesion was totally excised in a piecemeal fashion along with its osseous capsule. No recurrence was detected at the 3-month follow-up.

Case 2: A 21-year-old male presented with left cheek pain. He had a history of an incomplete excision via Caldwell–Luc in 2015 at another center. Imaging showed a 37 × 42 mm, multiseptated, expansile solid lesion arising from the sinus floor. The mass was totally excised piecemeal using a combined endoscopic medial maxillectomy and Caldwell–Luc approach. Associated teeth (23, 25, 27) were extracted, and the resulting oroantral fistula was repaired with a Bichat flap. No recurrence was detected at the 2-month follow-up.

RESULT: Although rare in the maxillary sinus, large COF lesions can radiologically mimic aggressive tumors. For extensive lesions involving the lateral, inferior, and anterior walls, an endoscopic approach alone may be insufficient. In such cases, a combined endoscopic medial maxillectomy and Caldwell–Luc approach ensures access to all sinus walls, facilitating complete excision.

Keywords: Caldwell–Luc, cemento-ossifying fibroma, endoscopic medial maxillectomy, fibro-osseous lesion, maxillary sinus, odontogenic tumor

GİRİŞ

Semento-ossifiye fibromlar (SOF), çene kemiklerinin primitif periodontal membran hücrelerinden köken alan, yavaş büyüyen ancak lokal agresif davranış sergileyebilen benign fibro-osseöz neoplazilerdir.[1] Dünya Sağlık Örgütü (WHO) sınıflandırmasında sement ve kemik doku üreten neoplastik bir süreç olarak tanımlanır.[2] Büyük çoğunluğu mandibulada yerleşmekle birlikte, maksiller sinüs tutulumu oldukça nadirdir.[3]

Genellikle çene kemiklerinde ağrısız şişlikle karakterize olan SOF, kadınlarda belirgin şekilde daha sık görülür (kadın/erkek oranı 5:1) ve sıklıkla 2. ila 4. dekadlarda saptanır.[4] Ancak juvenil trabeküler tipi gibi histolojik varyantlar, ortalama 11.5 yaş gibi daha genç popülasyonlarda da ortaya çıkabilir.[5] Tümörün lokalizasyonu semptom profili üzerinde doğrudan belirleyicidir; mandibulada yerleştiğinde yüz deformitesi ve çenede büyüme ön plandayken, maksiller yerleşimlerde erken evrede burun tıkanıklığı ve epistaksis görülebilir.[6,7] SOF vakalarında kesin teşhis; klinik, radyolojik ve patolojik bulguların bir arada değerlendirilmesiyle konulmalı, özellikle fibröz displazi ve odontojenik kistler gibi benzer fibro-osseöz lezyonlardan dikkatle ayırt edilmelidir.[1]

Maksiller sinüs yerleşimli SOF'lar, anatomik boşluğun geniş olması sebebiyle genellikle geç evrede, belirgin bir boyuta ulaştıktan sonra semptom verirler.[8] Nazal obstrüksiyon, fasiyal asimetri, baş ağrısı ve dental şikayetler en sık başvuru nedenleridir.[9] Tedavisi cerrahi eksizyondur; ancak kitlenin posterolateral sınırlara, orbita tabanına veya kribriform plağa yakın komşuluğu, cerrahi yaklaşım seçimini kritik hale getirir. Tek başına endoskopik yaklaşımlar lateral ve anterior duvar kör noktalarında yetersiz kalabilirken; açık yaklaşımlar da superior/medial sınırlarda sınırlı görüş sunabilir.[10]

Bu bildiride, maksiller sinüs SOF'u tanısıyla kliniğimizde opere edilen ve transnazal Endoskopik Medial Maksillektomi (EMM) ile Caldwell-Luc cerrahisinin kombine olarak kullanıldığı iki nadir olgu güncel literatür verileri ışığında sunulmuştur.

OLGU SUNUMLARI

Kliniğimizde maksiller sinüs yerleşimli, histopatolojik olarak SOF tanısı alan iki erkek hasta retrospektif olarak değerlendirildi. Hastaların klinik, radyolojik bulguları, cerrahi yaklaşımları ve postoperatif takip sonuçları analiz edildi.

Olgu 1

Otuz bir yaşında erkek hasta, kliniğimize 4 aydır olan burun tıkanıklığı şikâyeti ile başvurdu. Fizik muayene sol alt konkada, nazal tabanda ve sert damak solunda kitleye bağlı dolgunluk izlendi. Yirmi altı numaralı rezidüel diş kökü mevcuttu. Yapılan paranasal sinüs bilgisayarlı tomografi (BT) ve manyetik rezonans görüntüleme (MRG) tetkiklerinde; sol maksiller sinüsü tamamen dolduran, sinüsün tüm kemik duvarlarında yer yer incelmelere yol açan ve nazal kaviteye doğru uzanım sergileyen, 42 x 51 mm boyutlarında ekspansif kitle lezyonu izlendi (Figür 1). Olgunun panoramik görüntülemesinde ayırıcı bir özellik izlenmedi (Figür 2).

Hastaya genel anestezi altında cerrahi rezeksiyon planlandı. Operasyona ilk olarak transnazal EMM ile başlandı. Ancak lezyonun maksiller sinüsün anterior, lateral ve inferior duvarlarına yaygın yapışıklık göstermesi ve endoskopik enstrümantasyon sınırlarını zorlaması nedeniyle, görüş açısını genişletmek ve tam rezeksiyon sağlamak amacıyla Caldwell–Luc yaklaşımı kombine edildi. Cerrahi diseksiyon esnasında kitle içerisine gömülü olduğu saptanan 26 numaralı devital diş kökü çekildi. Oroantral açıklık primer sütürasyon ile onarıldı. Lezyon, çevre kemik dokudan dikkatle ayrılarak piecemeal yöntemle ve osseöz kapsülü ile total eksize edildi (Figür 3). Histopatolojik inceleme sonucu SOF olarak raporlanan hastanın postoperatif 3. ayındaki klinik ve radyolojik kontrolünde nüks saptanmadı (Figür 4).

Olgu 2

Yirmi bir yaşında erkek hasta, sol yanak üzerinde ağrı şikâyeti ile kliniğimize başvurdu. Hastanın anamnezinden, 2015 yılında dış merkezde ossifiye fibroma ön tanısıyla Caldwell–Luc yaklaşımı kullanılarak opere edildiği, ancak kitlenin anatomik kısıtlılıklar nedeniyle total eksize edilemediği ve rezidüel doku kaldığı öğrenildi. Fizik muayenesinde endoskopik olarak nazal kavitede patoloji saptanmadı. Sol vestibüler sulkusta eski operasyona ait insizyon skarı mevcuttu. Yapılan güncel paranasal sinüs görüntülemelerinde; sol maksiller sinüs tabanına oturan, 37 x 42 mm boyutlarında, multiseptalı, ekspansif karakterde solid lezyon izlendi (Figür 5). Olgunun panoramik görüntülemesinde sol maksiller sinüste opasitenin artmış olduğu ve 23, 25 ile 27 numaralı dişlerin kitle ile ilişkili olduğu görüldü (Figür 6). Hastaya nüks riskini minimuma indirmek ve cerrahi sınır kontrolünü tam sağlamak amacıyla EMM ve Caldwell–Luc kombinasyonu uygulandı. Bu ikili yaklaşımla kitlenin hem transnazal hem de transoral yolla tüm sınırlarına hâkim olundu ve lezyon piecemeal şeklinde total olarak eksize edildi (Figür 7). Kitle ile ilişkili olan 23, 25 ve 27 numaralı dişlerin çekimi gerçekleştirildi. Diş çekimleri ve tümör rezeksiyonu sonrası 23 ve 25 numaralı diş soketinde oluşan açıklık primer sütürasyon ile, 27 numaralı diş soketinde oluşan oroantral açıklık ise Bichat yağ flebi transpozisyonu ile onarıldı (Figür 8). Histopatolojik incelemesi SOF ile uyumlu gelen hastanın postoperatif 2. ayında yapılan takibinde herhangi bir komplikasyon veya nüks bulgusuna rastlanmadı (Figür 9).

TARTIŞMA

OF, periodontal ligamentin multipotent mezenkimal hücrelerinden köken alan, benign ancak progresif büyüme potansiyeline sahip fibro-osseöz bir neoplazidir. Klinik terminolojide tarihsel olarak "sementifiye fibrom" veya yalnızca “ossifiye fibrom" terimleri kullanılmış olsa da, güncel literatür bu tanımların eş anlamlı olduğunu ve “semento-ossifiye fibrom”u işaret ettiğini kabul etmektedir. Histopatolojik açıdan değerlendirildiğinde; fibröz bir doku zemininde farklı oranlarda kemik ve/veya sement benzeri mineralize materyal barındıran, kapsüllü, neoplastik bir oluşumdur.[11]

Dünya Sağlık Örgütü'nün 2017 yılında yayınladığı Baş ve Boyun Tümörleri Sınıflandırması 4. baskısında tüm OF türleri tek bir grup altında toplanmıştı. Bu sınıflamada lezyonlar, "Fibro-Osseöz ve Osteokondromatöz Lezyonlar" ana kategorisi altında "Ossifiye Fibrom" başlığıyla şu üç alt tipe ayrılmaktaydı: Semento-OF, juvenil trabeküler OF ve juvenil psammomatoid OF.[12] 2022'deki güncel (5.) baskıda yapılan en büyük değişiklik, bu listedeki SOF’un bu gruptan tamamen çıkartılarak "Benign Mezenkimal Odontojenik Tümörler" sınıfına dahil edilmesi ve diğer juvenil subtitplerden kesin olarak ayrılması olmuştur.[2]

Fibröz displazi ile SOF, benzer klinik belirtiler gösterebilen ve baş-boyun bölgesinde sıkça karşılaşılan iki önemli fibro-osseöz lezyondur. Ancak histopatolojik kökenlerinden tedavi yöntemlerine kadar pek çok temel noktada birbirlerinden kesin olarak ayrılırlar. Fibröz displazi, gelişimsel bir anomalidir bu nedenle çevresindeki normal kemik dokusu ile sınırları net bir şekilde ayrılmaz. Lezyon sınırlı ise konservatif yaklaşım tercih edilir; estetik veya fonksiyonel bozukluk yaratan durumlarda ise kısmi rezeksiyon (tıraşlama/contouring) uygulanır.[13]

Neoplastik lezyon olması nedeniyle SOF tedavi planlamasının hem cerrahi öncesi hem de sonrası dönemde histopatolojik incelemeyle desteklenmesi şarttır. Preoperatif biyopsi, lezyon sınırlarının belirlenerek tam eksizyonun kolaylaştırılmasında, malignite olasılığının dışlanarak adjuvan tedavi ihtiyacının saptanmasında ve diğer benign mezenkimal veya fibro-osseöz lezyonların ayırıcı tanısında kritik rol oynar.

SOF teşhisi için preoperatif biyopsi ile ortopantomografi, BT ve MRG gibi çeşitli görüntüleme yöntemlerinin multidisipliner bir yaklaşımla değerlendirilmesi gerekir. Küçük kitlelerde ise konik ışınlı BT yeterli iken kafa tabanı tutulumu şüphesinde kontrastlı paranazal sinüs BT temel yaklaşımı oluşturur. Büyük kitlelerde intrakraniyal yapıların veya yumuşak doku invazyonunun değerlendirilmesi için MRG tetkikine ihtiyaç duyulabilir.[3]

Olguların %75'i posterior mandibula yerleşimlidir. SOF'lerin geleneksel olarak periodontal ligament kaynaklı olduğu düşünülse de sfenoid, frontal veya etmoid gibi non-odontojenik kemiklerde de izlenmesi, ilkel mezenkimal hücrelerin hatalı doku indüksiyonundan köken alabildiklerini göstermektedir. Etiyolojide travma, periodontitis, diş çekimi ve HRPT2 gen mutasyonlarının rol oynadığı düşünülmektedir.[3] Erken dönemde asemptomatik olan bu tümörler, yavaş fakat progresif büyüme trendiyle ağrısız kemik ekspansiyonuna, fasiyal asimetriye ve dişlerde mobilite ile kök rezorbsiyonuna yol açabilir. Maksilla yerleşimli lezyonlar, sinüs duvarlarını aşarak sfenoid kemik, pterygoid proçes ve çevre komşuluklara kadar geniş bir ekspansiyon sergileyebilir. Ağrı ve parestezi ise nadirdir.[3]

Kranyofasiyal SOF'lerin yarattığı fonksiyonel ve kozmetik kayıplar, genellikle kitlenin total olarak çıkarılmasını zorunlu kılar. Literatürde mandibuladaki sınırlı lezyonlar için enükleasyon veya küretaj gibi konservatif yöntemler ilk seçenek olarak sunulsa da maksiller yerleşimli tümörler; geç tanı konulmaları, daha büyük boyutlara ulaşmaları ve anatomik sınırları nedeniyle çok daha yüksek nüks potansiyeline sahiptir.[14] Nüksü önlemek için lezyonun dahil olduğu maksiller sinüs duvarları ve gereğinde orbita tabanıyla birlikte bütünsel olarak eksize edilmesi önerilmektedir.[15] Ancak derin anatomik lojlara (pterygoid proçes, kafatabanı vb.) uzanan geniş kitlelerde radikal rezeksiyonlar cerrahi riski artırmakta, preoperatif üç boyutlu BT ve anjiyografi gibi ileri görüntüleme yöntemleriyle vasküler komşulukların (karotis arterleri gibi) titizlikle analiz edilmesini gerektirmektedir.[14]

Literatür incelendiğinde, maksiller sinüs tutulumlarının cerrahi yöntemi ve nüks oranları üzerinde halen devam eden bir tartışma mevcuttur. Liu ve ark.[16] tarafından bildirilen çok merkezli maksilla ve sinonazal trakt yerleşimli OF serisinde (13 olgu), en sık tutulum yerinin maksiller sinüs (%46) olduğu belirtilmiş; olguların %85'ine açık cerrahi uygulanmasına rağmen ortalama 47,3 aylık takipte %23 gibi yüksek bir nüks oranı bildirilmiştir. Bu seride yazarlar, endoskopik ve açık cerrahinin birbirine üstünlüğü konusunda kesin bir görüş birliği olmadığını, asıl temel belirleyicinin cerrahi sınırların güvenli şekilde kontrol edilerek komplet rezeksiyonun sağlanması olduğunu vurgulamışlardır.

Liu Y. ve ark.[17] bir başka serisinde cerrahi yöntem ile nüks arasında belirgin bir ilişki saptanmış; küretaj ve sınırlı lokal rezeksiyon uygulanan olgularda nüks oranları yüksek izlenirken, geniş eksizyon uygulanan hastalarda nüks belirgin şekilde daha düşük bulunmuştur. Yazarlar, geniş ve kompleks lezyonlarda inkomplet eksizyonun nüks için en temel risk faktörü olduğunu belirtmişlerdir.

Son yıllarda endoskopik cerrahi tekniklerin gelişmesiyle birlikte daha az morbiditeye sahip seriler de literatürde yerini almıştır. Wang ve ark.'nın[18] 31 olguluk sinonazal OF serisi, literatürdeki en geniş endoskopik ağırlıklı serilerden biri olup; 26 olgu endoskopik, 5 olgu açık yaklaşımla opere edilmiş ve nüks oranı %13 olarak

bildirilmiştir. Benzer şekilde, Ma ve ark.[19] tarafından sunulan 34 pediatrik paranazal sinüs ve kafa tabanı yerleşimli OF serisinde tüm olgular transnazal endoskopik cerrahiyle tedavi edilmiş ve nüks oranı %14,7 olarak bulunmuştur. Bu güncel seriler, endoskopik yaklaşımların başarısını ortaya koysa da maksiller sinüsün anterior, lateral duvarı ve alveolar proses gibi bölgeler endoskopik cerrahi için halen kör nokta teşkil etmeye devam etmektedir.

Olgularımızda uyguladığımız transnazal EMM ve intraoral Caldwell-Luc kombinasyonu, tam olarak bu kısıtlılıkları ortadan kaldırmaya yöneliktir. Tümörün benign yapısı ve yavaş büyüme karakteri göz önüne alındığında; bu kombine yaklaşım, eksternal yaklaşımların morbiditesini önlemiştir. Endoskopik sinüs cerrahisi ile kitlenin medial ve posterior sınırları net olarak kontrol altına alınırken; aynı seansta yapılan intraoral Caldwell-Luc yaklaşımı ise lezyonun sinüs tavanı, tabanı ve lateral duvarından kapsülüyle birlikte total eksize edilmesini sağlamıştır. Bu sayede hem geniş, radikal doku rezeksiyonlarının önüne geçilmiş hem de hastaların estetik ve fonksiyonel konforunu maksimum düzeyde korunmuştur. Sonuç olarak, tam rezeksiyon sağlanmış olsa dahi bu olgularda uzun dönemli takibin önemi büyüktür ve olası nükslerde sekonder konservatif yaklaşımlar tercih edilmelidir.

SONUÇ

Maksiller sinüs yerleşimli SOF'lerin cerrahi tedavisinde, EMM ile Caldwell-Luc yaklaşımının kombinasyonu; mükemmel cerrahi marjin kontrolü, düşük morbidite, estetik avantajlar ve nüks oranını azaltma potansiyeli sunan, hibrit ve son derece efektif bir tedavi modelidir. Özellikle kalsifiye ve geniş tabanlı maksiller sinüs tümörlerinde ilk seçenekler arasında düşünülmelidir. Ayrıca multidisipliner yaklaşım ile lezyonun dentoalveoler yapılarla ilişkisinin doğru yönetimi ve rezeksiyona sekonder gelişebilecek oroantral defektlerin onarımı, cerrahi başarıyı ve postoperatif yaşam kalitesini belirleyen kritik unsurlardır.

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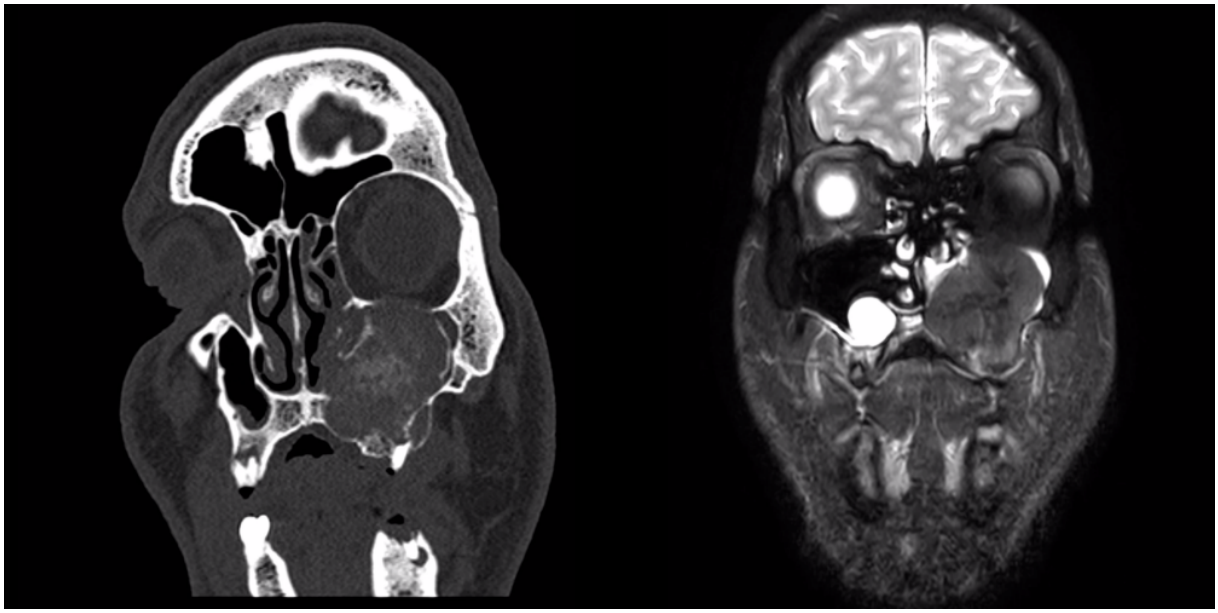
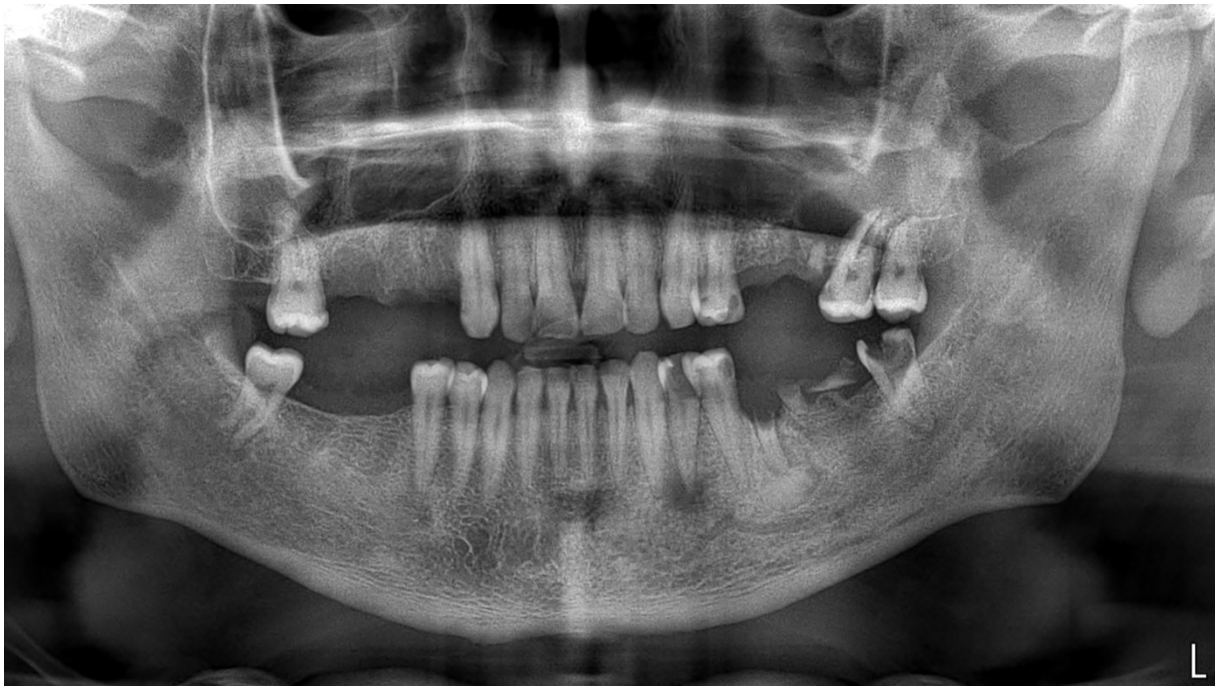
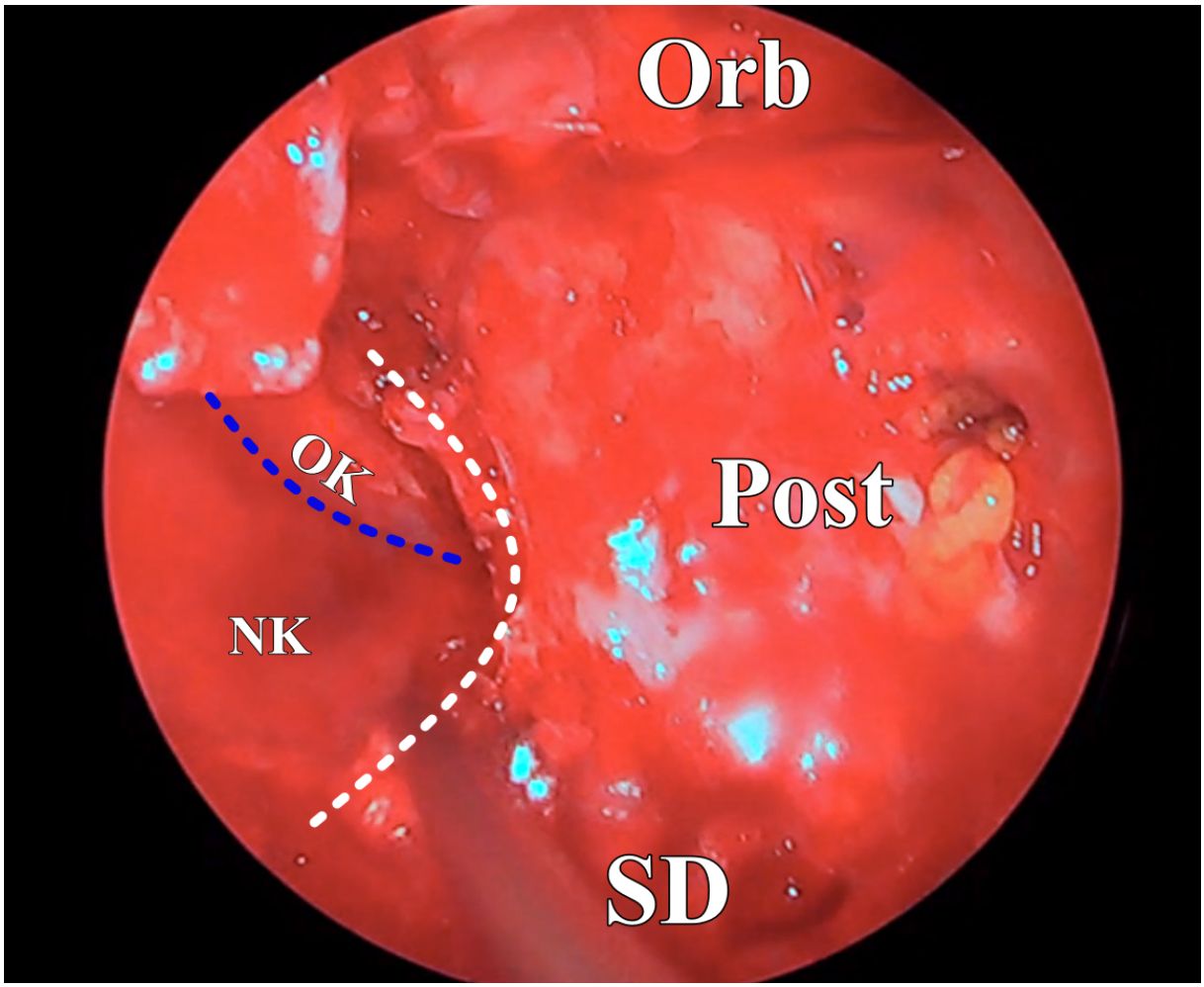


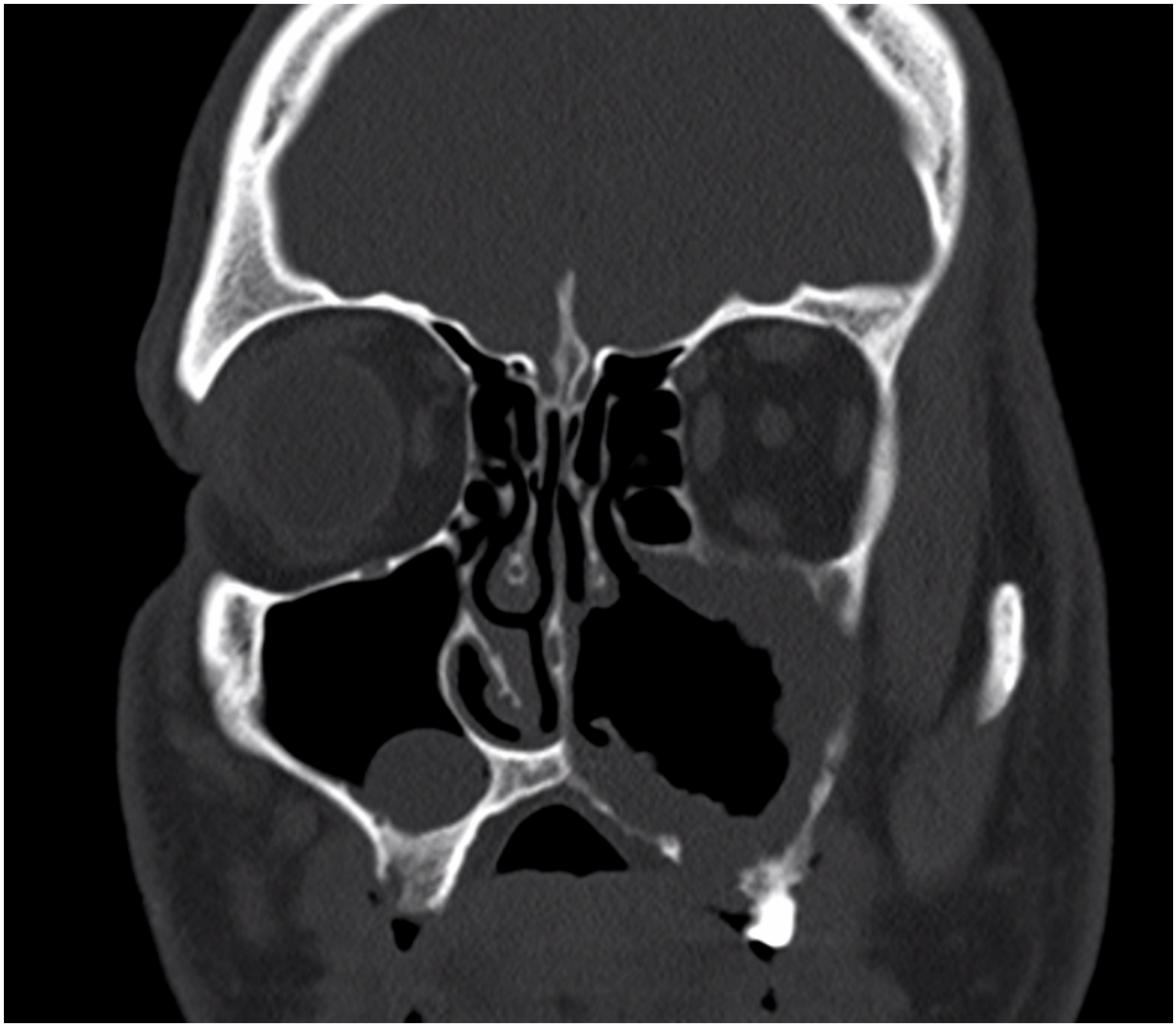
Figür 1. Olgu 1'e ait preoperatif paranasal sinüs bilgisayarlı tomografi ve manyetik rezonans görüntülemesi



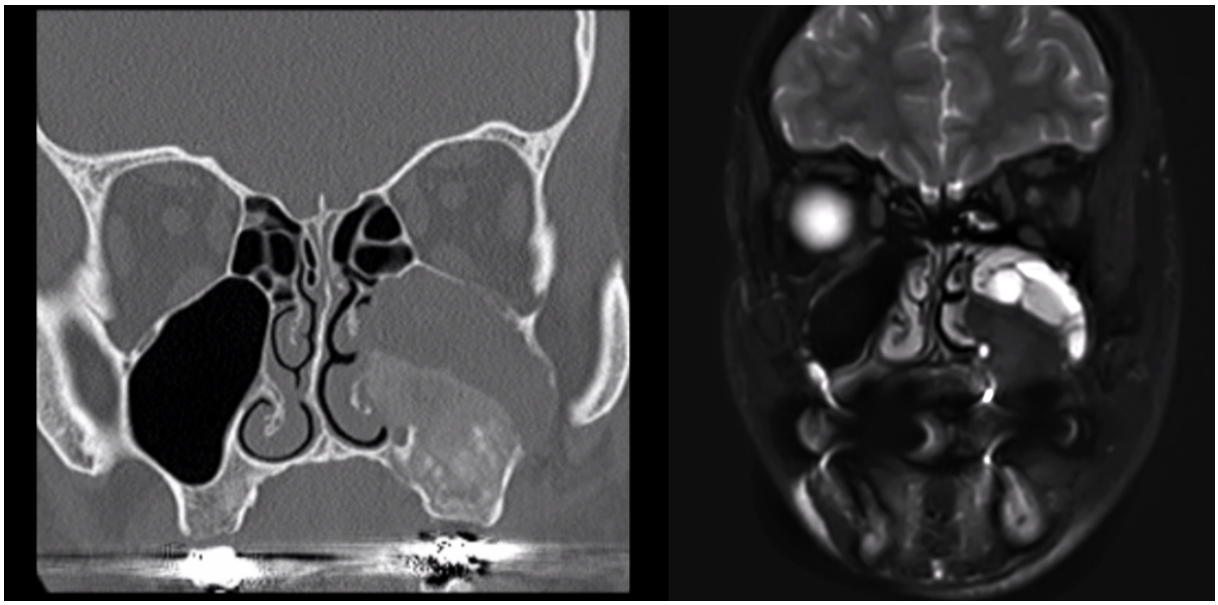
Figür 2. Olgu 1'e ait preoperatif ortopantografi.



Figür 3. Endoskopik medial maksillektomi ve Caldwell-Luc yaklaşımı ile kitle total eksize edildikten sonra Olgu 1'e ait maksiller sinüs görüntüsü. (NK: Nazal kavite, OK: Orta konka [mavi çizgi], Orb: Orbital tabanı, Post: Maksiller sinüs posterior duvarı, SD: Sert damak, Beyaz çizgi: Medial maksillektomi hattı)

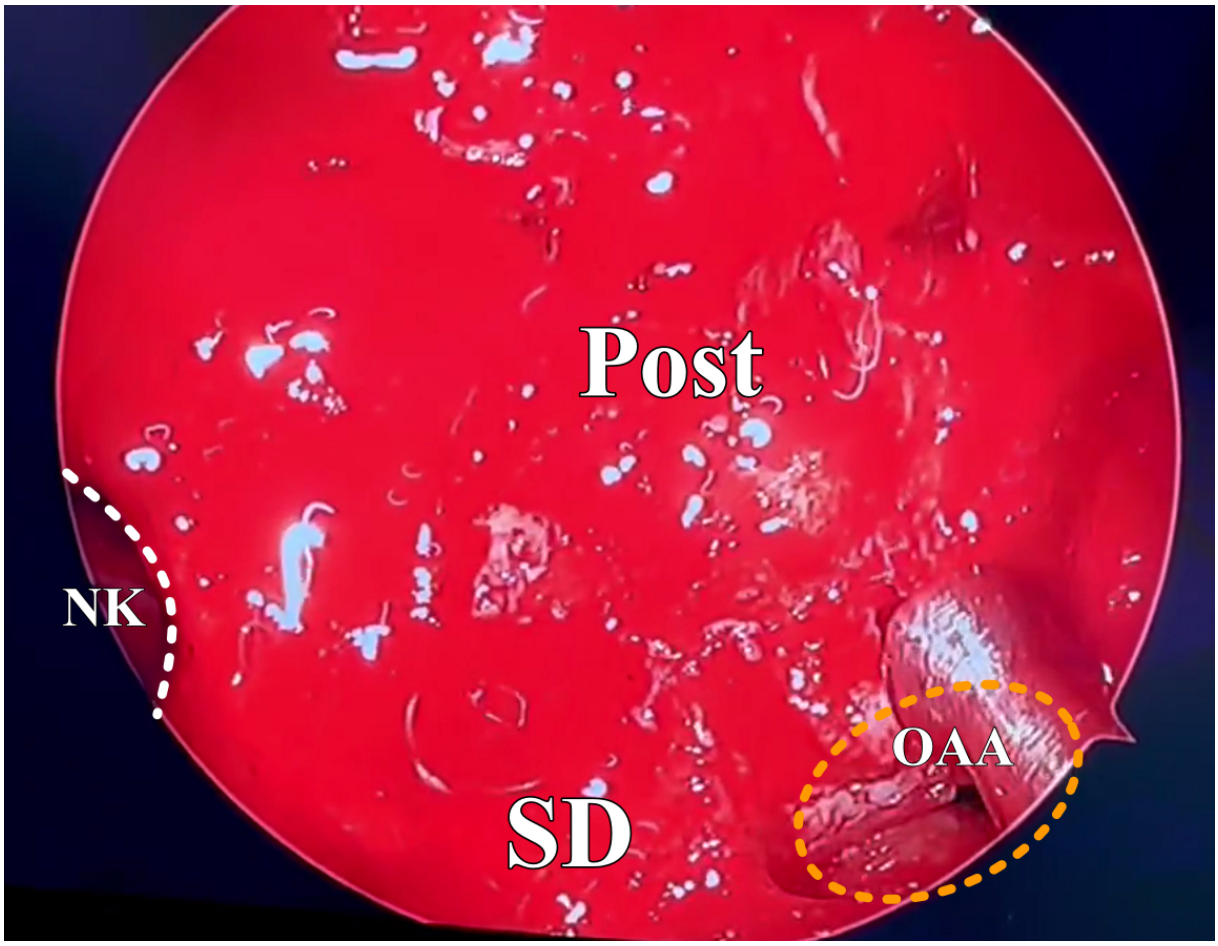


Figür 4. Olgu 1'e ait postoperatif 3. ay paranasal sinüs bilgisayarlı tomografi görüntüsü.

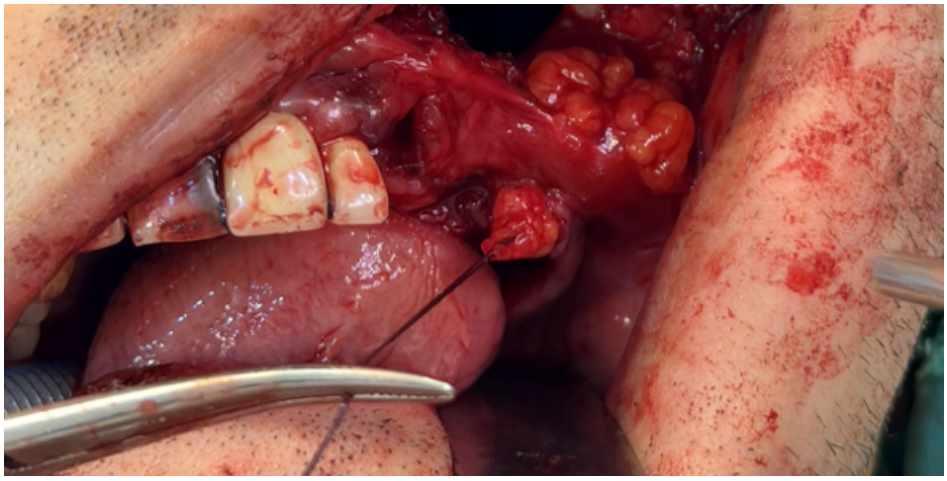


Figür 5. Olgu 2'ye ait preoperatif paranasal sinüs bilgisayarlı tomografi ve manyetik rezonans görüntülemesi.

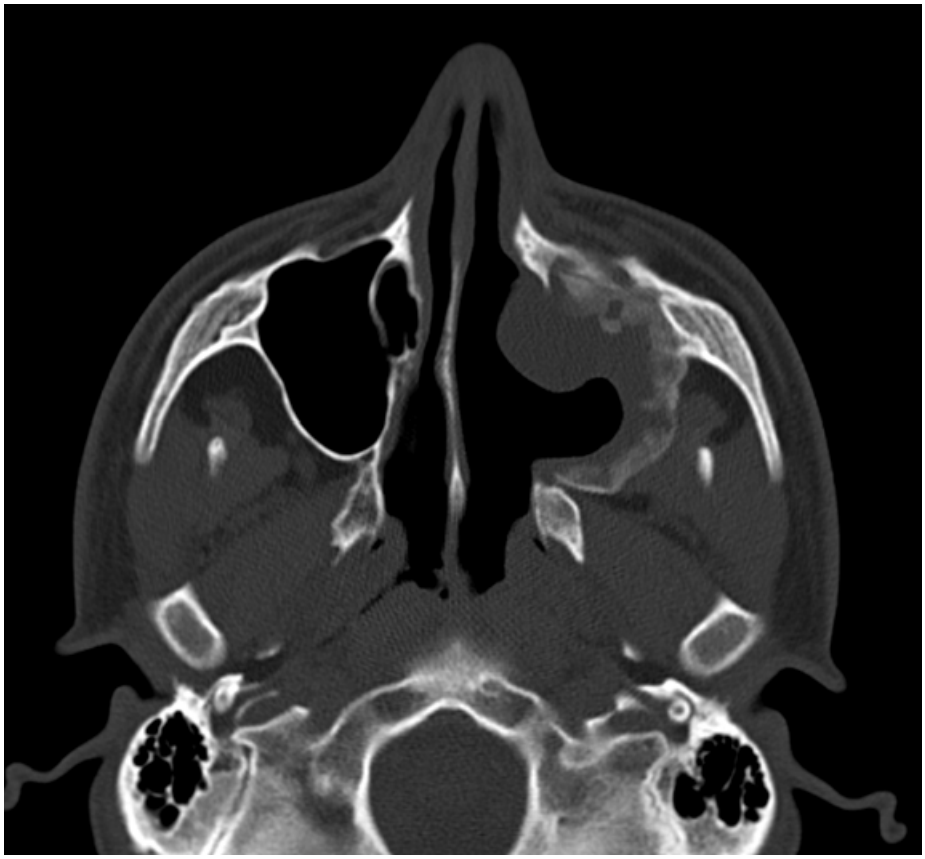
Figür 6. Olgu 2'ye ait preoperatif ortopantografi.



Figür 7. Endoskopik medial maksillektomi ve Caldwell-Luc yaklaşımı ile kitle total eksize edildikten sonra Olgu 2'ye ait maksiller sinüs görüntüsü. (NK: Nazal kavite, OAA: 27 numaralı diş soketine ait oroantral açıklık, Post: Maksiller sinüs posterior duvarı, SD: Sert damak, Beyaz çizgi: Medial maksillektomi hattı)



Figür 8. 27 numaralı diş soketinde oluşan oroantral açıklığın Bichat yağ flebi transpozisyonu onarımı.



Figür 9. Olgu 2'ye ait postoperatif 2. ay paranasal sinüs bilgisayarlı tomografi görüntüsü.

6. Figures

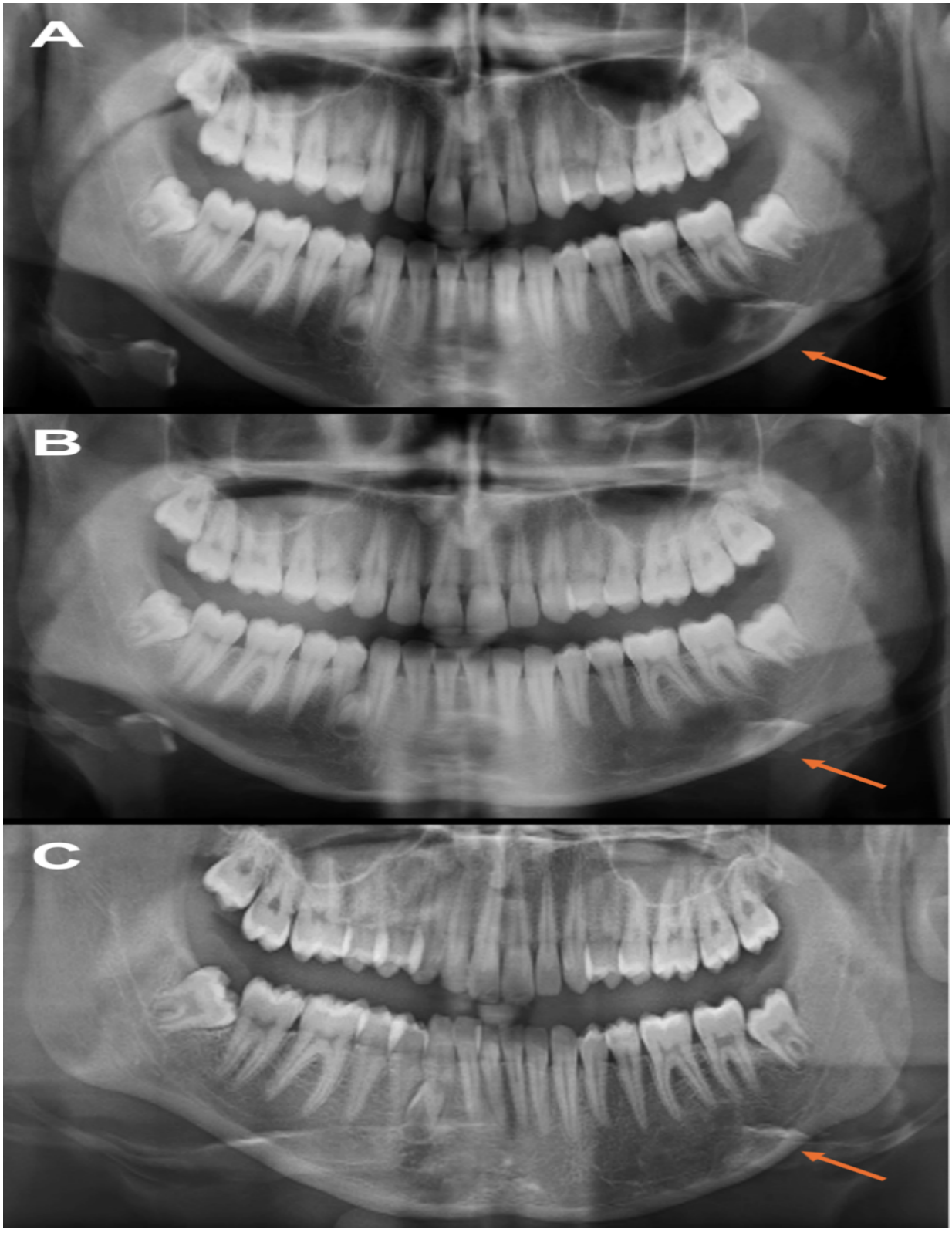


Figure 1: An example of a case treated by surgical exploration and curettage. A: Preoperative radiographic image. B: Radiographic evidence of bone fill at 6-month follow up. C: At the 1-year follow-up, the lesion side showed nearly complete restoration of normal bone appearance.

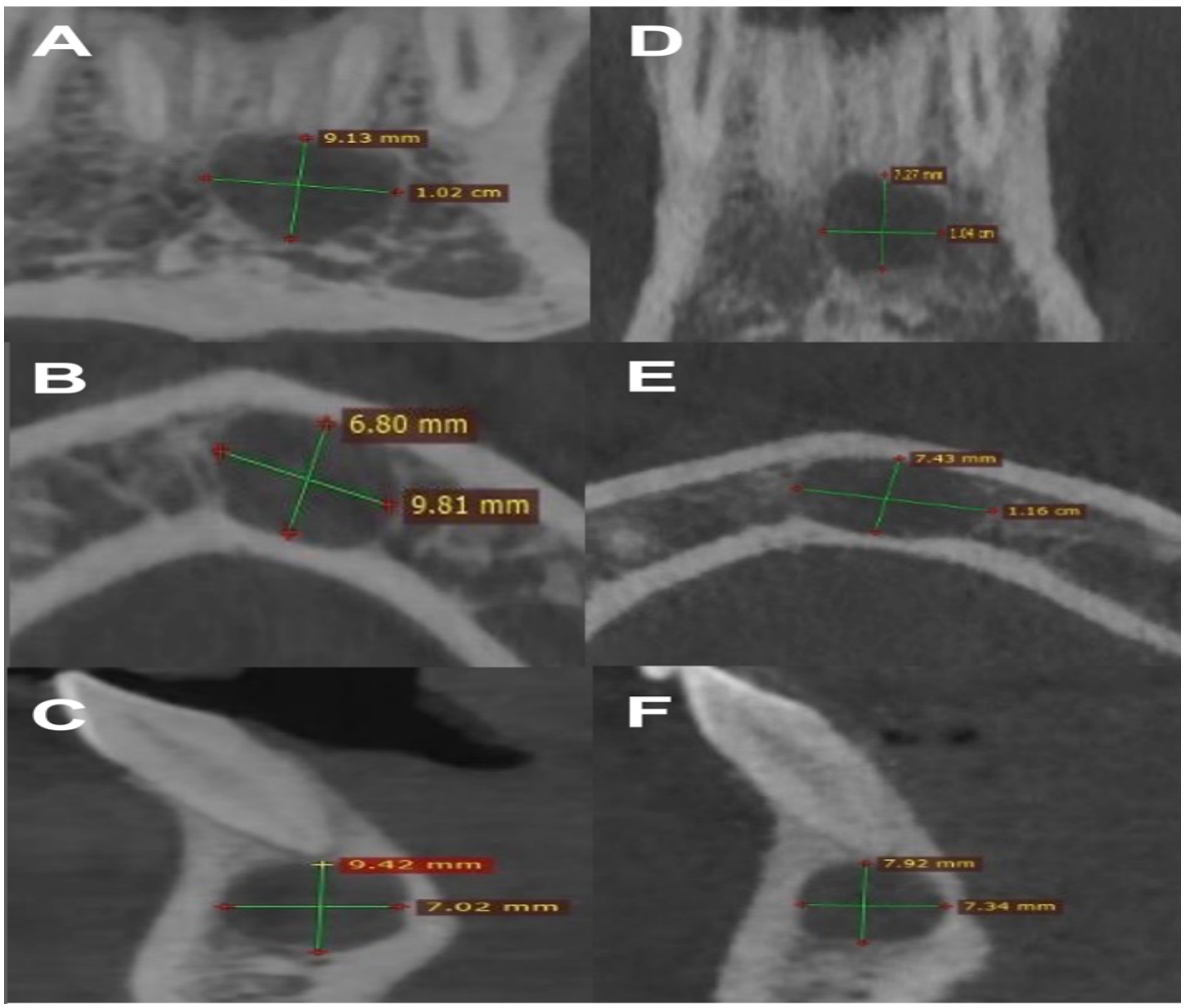


Figure 2: CBCT images of a case showing delayed radiographic healing. A-C: Preoperative CBCT images. D-F: CBCT images obtained at the 6-month follow-up, showing limited intraosseous bone formation.

Figure 3: Cortical bone fixation with a miniplate in a patient at risk of pathological fracture.

7. Tables

Table 1: Clinical and radiographic characteristics, risk assessment, management, and outcomes of the nine mandibular traumatic bone cysts

Case No	Location	Symptoms	Radiographic Pattern	Structural Risk	Management	Follow-up Outcome
1	Posterior	No	Unilocular	Intermediate	Curettage+ Collagen sponge	Progressive bone filling
2	Posterior	No	Unilocular	High	Curettage+ Collagen sponge+ Miniplate fixation	Progressive bone filling, no fracture
3	Posterior	No	Unilocular	Low	Active surveillance	No complications
4	Anterior	No	Unilocular	Intermediate	Curettage	Progressive bone filling
5	Premolar	No	Unilocular	Low	Active surveillance	No complications
6	Posterior	No	Unilocular	Intermediate	Curettage+ Collagen sponge	Progressive bone filling
7	Posterior	No	Unilocular	Intermediate	Curettage	Progressive bone filling
8	Posterior	No	Unilocular	Intermediate	Curettage	Progressive filling
9	Anterior	No	Unilocular	Intermediate	Curettage	Incomplete healing

Table 2: Proposed risk-oriented framework for the management of mandibular traumatic bone cysts

Clinical category	Main features	Suggested management	Follow-up/ escalation
A.Diagnostic uncertainty	Atypical borders; mixed appearance; rapid growth; pain/swelling; non-vital teeth; root resorption/displacement	CBCT ± aspiration; exploration/biopsy	Exclude other lesions before observation
B.Low structural risk	Small; asymptomatic; unilocular/scalloped; vital teeth; intact cortex and inferior border; stable lesion	Active surveillance	Review at 6 months, then annually; operate if growth, symptoms, or cortical loss occurs
C.Intermediate risk	Moderate extent; limited expansion/thinning; mandibular continuity preserved; diagnostic confirmation required	Exploration and curettage; histopathology; optional PRF/collagen	Radiographs at 6 and 12 months; limited bone fill at 6 months does not indicate recurrence alone
D.High mechanical risk	Extensive lesion; severe cortical thinning/perforation; weakened inferior border or angle; fracture concern	Exploration and curettage; preserve/reposition cortical window; consider miniplate fixation	Close follow-up; stabilization according to residual bone strength
E.Higher persistence risk	Multiple; multilocular; bilateral; recurrent; cemento-osseous dysplasia-associated; progressive lesion	Reassess diagnosis and structural risk; consider re-exploration	Prolonged follow-up; intervene if enlargement, symptoms, or mechanical weakening develops

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SS-064

ODONTOGENIC KERATOCYSTS: FROM DIAGNOSTIC PITFALLS TO HISTOPATHOLOGY-GUIDED CONSERVATIVE SURGICAL MANAGEMENT

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Abstract

Objectives: Odontogenic keratocysts (OKCs) are benign lesions with locally aggressive behavior and the potential to invade adjacent soft tissues and bone. Given the radiographic overlap with other odontogenic and non-odontogenic lesions, histopathological examination is essential for definitive diagnosis and appropriate treatment planning. This study evaluates the clinical effectiveness of conservative surgical approaches in four patients with histopathologically confirmed OKCs.

Case report: Four patients with histopathologically confirmed odontogenic keratocysts are presented. Clinical presentation, radiographic characteristics, surgical management, histopathological findings, and postoperative follow-up outcomes were documented and analyzed. Two extensive mandibular lesions exhibiting cortical perforation and close proximity to the inferior alveolar nerve were managed by marsupialization followed by enucleation, whereas two lesions without extensive cortical involvement underwent enucleation. Histopathological examination confirmed the diagnosis of OKC in all cases. During follow-up ranging from 6 months to 2 years, no recurrence was observed. One patient developed transient postoperative paresthesia, whereas no other major complications were encountered.

Conclusion: Patient-specific treatment planning based on lesion characteristics is essential for the management of OKCs. Histopathology-guided conservative surgery may achieve favorable outcomes when combined with long-term clinical and radiographic follow-up.

Key words: Odontogenic keratocyst, histodiagnostic, conservative surgical approach.

1. Introduction

Odontogenic keratocysts (OKCs) are developmental odontogenic cysts arising from remnants of the dental lamina, characterized by locally aggressive behavior and a high propensity for recurrence. Reflecting this distinct biological behavior, their classification has evolved significantly. The World Health Organization (WHO) classified OKCs as keratocystic odontogenic tumors in 2005; however, subsequent clinical and molecular evidence led to their reversion to developmental odontogenic cysts in the 2017 WHO Classification, a designation retained in the 2022 revision.[1]

OKCs are most frequently diagnosed during the third and fourth decades of life, frequently involving the posterior body, angle, and ramus of the mandible.[2,3] Although they often remain asymptomatic for prolonged periods, symptomatic lesions typically present with swelling and pain. As the lesion expands, it may present with tooth displacement, secondary infection, trismus, pathological fracture, maxillary sinus involvement, or unilateral nasal obstruction.[2] Because the radiographic features of OKCs frequently mimic those of various other odontogenic and non-odontogenic lesions, radiographic findings alone are insufficient for a definitive diagnosis. Consequently, histopathological examination remains indispensable for confirming the diagnosis and formulating an appropriate treatment plan.[2,3]

The major challenge in the management of OKCs stems from their high recurrence rate, which is associated with factors such as a fragile cystic lining, the presence of satellite cysts, syndromic associations, cortical perforation and incomplete surgical removal.[4,7] Most recurrences occur within the first 5 to 7 years after treatment, and maxillary lesions tend to recur earlier than mandibular ones. Therefore, long-term clinical and radiographic follow-up is essential.[5,8] Current therapeutic strategies range from conservative approaches, such as marsupialization and enucleation, to radical resection. Therefore, treatment should be individualized according to lesion characteristics and patient-related factors. This case series aimed to evaluate the clinical outcomes of histopathology-guided conservative surgical management in four patients with histopathologically confirmed OKCs.

2. Case

2.1. Case 1

A 26-year-old systemically healthy female presented with pain and swelling in the right posterior mandible. Intraoral examination revealed buccal cortical expansion in the right posterior mandibular region. Radiographic evaluation demonstrated a well-defined, unilocular radiolucency involving the mandibular body and angle, accompanied by root resorption of the adjacent teeth and buccolingual cortical perforation. Based on these initial radiographic findings, a provisional diagnosis of unicystic ameloblastoma was made.

Given the intimate relationship between the lesion and the inferior alveolar nerve, a staged-conservative surgical approach was planned. Fine-needle aspiration biopsy yielded keratinaceous material, strongly suggestive of an OKC. This finding supported the decision to proceed with marsupialization and concomitant incisional biopsy, which histopathologically confirmed the diagnosis. After a 2-month marsupialization period, delayed enucleation was successfully performed. During the 1-year clinical and radiographic follow-up period, neither recurrence nor postoperative complications were observed.

2.2. Case 2

A 44-year-old systemically healthy male presented complaining of pain in the right posterior mandible. Intraoral examination showed no signs of cortical expansion or soft tissue swelling. Radiographic assessment revealed an extensive, unilocular radiolucent lesion extending from the apical region of the mandibular right second molar to the mandibular condyle, associated with advanced cortical bone destruction. Considering the extensive size of the lesion, its close proximity to the inferior alveolar nerve and the high risk of pathological fracture, a staged-conservative surgical approach was selected.

Marsupialization was performed in conjunction with an incisional biopsy, which histopathologically confirmed the diagnosis of OKC. Following a 3-month marsupialization period, delayed enucleation was performed. At the 6-month follow-up, there were no evidence of recurrence. Transient post-operative paresthesia was the sole complication reported and the patient continues to undergo regular clinical and radiographic surveillance.

2.3. Case 3

A 39-year-old systemically healthy male presented with pain and swelling in the left anterior maxilla. Intraoral examination revealed soft tissue expansion in the left anterior maxillary region. Radiographic evaluation demonstrated a well-defined, unilocular radiolucency involving teeth 23–26 and extending adjacent to the maxillary sinus without sinus involvement. Based on the lesion

characteristics, enucleation was performed. Histopathological examination confirmed the diagnosis of OKC. Clinical and radiographic follow-up over 2 years revealed no evidence of recurrence.

2.4. Case 4

A 42-year-old systemically healthy male presented with pain in the left posterior mandible. Intraoral examination revealed no evidence of cortical expansion or soft tissue swelling. Radiographic examination demonstrated a well-circumscribed, unilocular radiolucent lesion associated with the roots of the mandibular left third molar. The associated third molar was extracted, followed by enucleation. Histopathological examination confirmed the diagnosis of OKC. Clinical and radiographic follow-up over 18 months revealed neither postoperative complications nor recurrence.

3. Discussion

The optimal management of OKCs remains controversial as no single modality consistently minimizes recurrence while preserving adjacent structures. Oginni et al.(2023) proposed an evidence-based algorithm recommending treatment by lesion size, cortical perforation, location and proximity to vital structures rather than a standardized protocol.[4] Similarly, Al-Moraissi et al.(2023) demonstrated that individualized treatment planning optimizes clinical outcomes while minimizing treatment-related morbidity.[5] The management of the present cases was consistent with these principles.

Marsupialization followed by delayed enucleation was selected for the two extensive mandibular lesions due to their proximity to the inferior alveolar nerve and associated morbidity risks, whereas enucleation was performed for the other two, less extensive lesions. This aligns with Borrás-Ferreres et al.(2020), who advocated conservative surgery for selected large lesions.[7]

Histopathological examination also played a pivotal role in treatment planning. In Case 1, despite radiographic findings suggesting unicystic ameloblastoma, keratinaceous aspiration strongly suggested OKC and subsequent histopathology confirmed the diagnosis. This agrees with Elshafei et al.(2022) and Valdivia et al.(2022), who emphasized that radiographic findings alone are insufficient for definitive diagnosis.[2,3]

Although no recurrence was detected during follow-up, this must be interpreted cautiously as most recurrences occur 5–7 years following surgery. Fidele et al.(2019) reported that most recurrences develop during this period, whereas Stoelinga et al.(2023) highlighted that short-term follow-up underestimates recurrence.[6,9] Accordingly, long-term surveillance remains essential regardless of the surgical approach.[10,11]

4. Conclusion

Successful management of odontogenic keratocysts requires balancing recurrence prevention with preservation of adjacent anatomical structures and minimization of surgical morbidity. These objectives are best achieved through individualized treatment planning supported by histopathological diagnosis.

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6. Figures

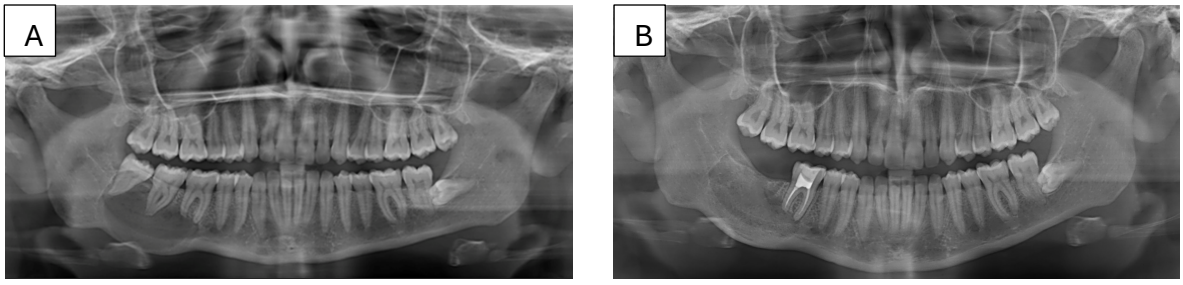

Figure 1: A-Preoperative radiographic view, B-Postoperative radiographic view (1-year)

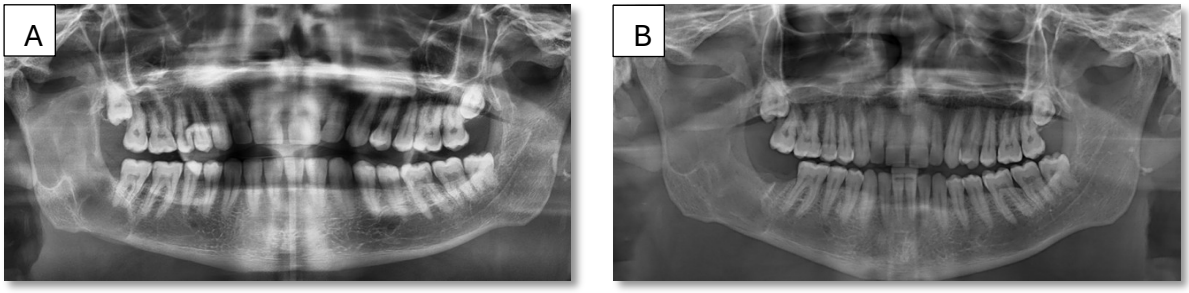

Figure 2: A-Preoperative radiographic view, B-Postoperative radiographic view (6-month)

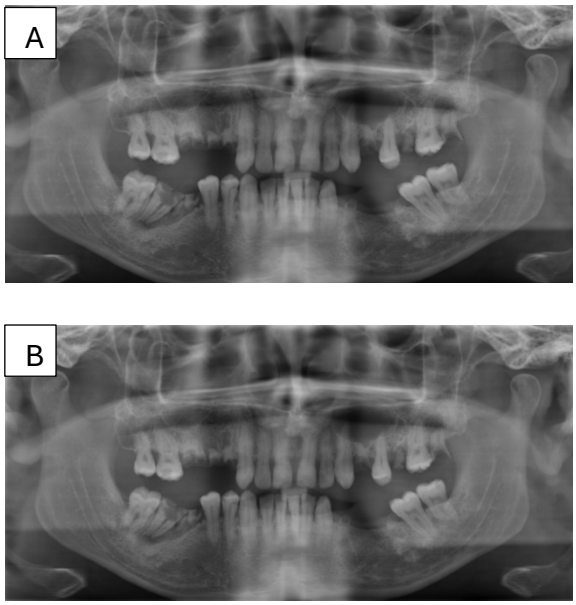

Figure 3: A-Preoperative radiographic view, B-Postoperative radiographic view (2-year)

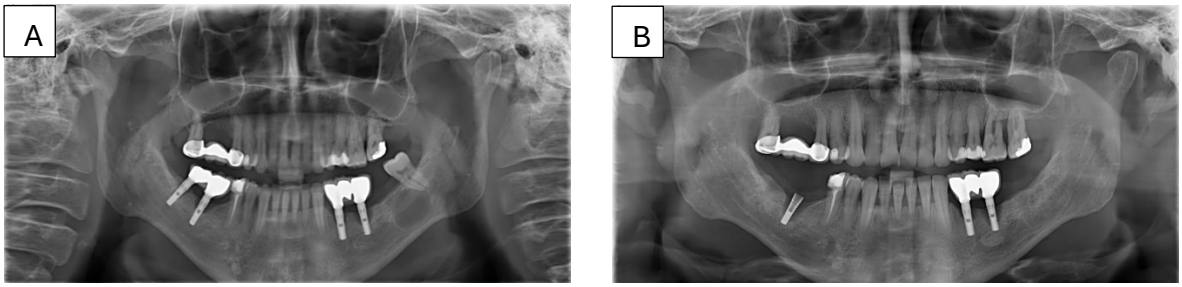

Figure 4: A-Preoperative radiographic view, B-Postoperative radiographic view (18-month)

SS-073

İleri Yaş ve Yüksek Morbiditeli MRONJ Hastalarında Patolojik Mandibula Kırıklarının Konservatif Yönetimi: Üç Olguluk Seri

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Giriş:
Medikasyona bağlı çene osteonekrozu (MRONJ), ileri evrelerde patolojik mandibula kırıkları ile seyreden ve yönetimi güç bir klinik durumdur. Evre III olgularda tedavi genellikle rezeksiyon ve rekonstrüksiyon gibi agresif cerrahi yaklaşımları içermektedir. Ancak ileri yaş ve eşlik eden sistemik hastalıklara bağlı artmış cerrahi morbidite nedeniyle her hastada cerrahi tedavi mümkün olmayabilir. Bu olgu sunumunda, MRONJ'ye bağlı patolojik mandibula kırıklarının konservatif yaklaşımla yönetilen olgularının sunulması amaçlanmıştır.

Olgu 1:
Tiroid kanseri nedeniyle IV bifosfonat kullanan hastada sol mandibula korpusunda nekrotik kemik, ekspoze implantlar ve patolojik kırık saptandı. Nekrotik kemik ve implantlar uzaklaştırılarak antibiyotik tedavisi başlandı. Lokal irrigasyon, antibiyotik ve yumuşak diyet ile 1 yıllık takipte klinik stabilite sağlandı.

Olgu 2:
Prostat kanseri, diyabet, hipertansiyon ve KBY öyküsü bulunan, denosumab (Xgeva) kullanan hastada mandibula anterior bölgede pürülan akıntılı nekrotik kemik saptandı. Takip sürecinde patolojik mandibula kırığı gelişen hastada agresif olmayan nekrotik kemik debridmanı yapıldı. Nefroloji konsültasyonu sonrası antibiyotik tedavisi ve konservatif yaklaşım ile takip edildi.

Olgu:3

66 yaşında, prostat kanseri nedeniyle IV bifosfanat kullanan hastada diş çekimi sonrası osteonekroz gelişmiştir. Klinik olarak pürülan akıntılı, ekspoze nekrotik kemik alanı izlenmiş ve takip sürecinde patolojik mandibula kırığı oluşmuştur. Hastaya konservatif yaklaşım kapsamında lokal irrigasyon, antibiyotik tedavisi ve sınırlı debridman uygulanmıştır.

Sonuç:

Medikasyona bağlı çene osteonekrozu (MRONJ), ileri evrelerde patolojik mandibula kırıkları ile seyreden kompleks bir klinik tablodur. Evre III olgularda tedavi çoğunlukla rezeksiyon ve rekonstrüksiyon gibi agresif cerrahi yaklaşımları içermektedir. Ancak ileri yaş ve yüksek morbidite varlığında cerrahi her zaman uygulanabilir değildir. Bu olgularda, MRONJ'ye bağlı patolojik mandibula kırıklarında konservatif tedavi yaklaşımının etkinliği değerlendirilmiştir.

Anahtar Kelimeler: MRONJ, Kanser, Patolojik Kırık

Conservative Management of Pathological Mandibular Fractures in Elderly and Medically Compromised MRONJ Patients: A Three-Case Series

Introduction:
Medication-related osteonecrosis of the jaw (MRONJ) is a complex clinical condition that may present with pathological mandibular fractures in advanced stages and poses significant management challenges. In stage III cases, treatment typically involves aggressive surgical approaches such as resection and reconstruction. However, due to advanced age and increased surgical morbidity associated with systemic comorbidities, surgical treatment may not be feasible in all patients. This case report aims to present cases of pathological mandibular fractures associated with MRONJ managed with a conservative approach.

Case 1:
A patient receiving intravenous bisphosphonate therapy for thyroid cancer presented with necrotic bone, exposed implants, and a pathological fracture in the left mandibular corpus. The necrotic bone and implants were removed, and antibiotic therapy was initiated. Clinical stability was achieved after a 1-year follow-up with local irrigation, antibiotic therapy, and a soft diet.

Case 2:
A patient with a history of prostate cancer, diabetes mellitus, hypertension, and chronic kidney disease, receiving denosumab (Xgeva), presented with purulent, exposed necrotic bone in the anterior mandible. During follow-up, a pathological mandibular fracture developed. Non-aggressive debridement of the necrotic bone was performed, and following nephrology consultation, the patient was managed with antibiotic therapy and a conservative approach.

Case 3:
A 66-year-old patient receiving intravenous bisphosphonate therapy for prostate cancer developed osteonecrosis following tooth extraction, with subsequent pathological mandibular fracture. The patient was managed conservatively with local irrigation, antibiotic therapy, and limited debridement.

Conclusion:
MRONJ is a complex clinical condition that may present with pathological mandibular fractures in advanced stages. Although treatment of stage III disease typically involves aggressive surgical approaches, surgery may not always be feasible in elderly patients with high morbidity. In such cases, conservative management may represent a viable alternative for infection control, symptom relief, and maintenance of functional stability.

Keywords: Cancer,MRONJ,Pathological fracture

SS-078

Internal Maxillary Artery Hemorrhage During Condylar Fracture Surgery: A Case Report and Literature Review

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Abstract

Introduction: Mandibular condylar fractures constitute a significant proportion of all mandibular fractures; however, vascular complications occurring during surgical management are exceedingly rare. The internal maxillary artery (IMA) is a critical vascular structure located near the medial cortex of the subcondylar region. Due to this anatomical relationship, it represents a considerable risk factor during condylar fracture surgery. Intraoperative IMA hemorrhage is a potentially life-threatening complication that is difficult to control because of its deep location and limited response to digital compression.

Case Report: A systemically healthy 29-year-old male patient was scheduled for surgical treatment with a diagnosis of an isolated left condylar fracture. During the operation, the inferior portion of the fracture fragment, which was displaced medially by approximately 90 degrees, was excised. Subsequently, during the mobilization of the condylar head that remained in situ due to muscular attachments, sudden massive hemorrhage originating from the internal maxillary artery occurred. As this situation rendered further dissection for anatomical reduction and rigid internal fixation unsafe, the treatment plan was modified intraoperatively. The condylar head was left in place, and hemostasis was achieved using topical hemostatic agents and firm tamponade. External compression was reinforced with a pressure dressing and head bandage. In the postoperative period, the patient regained physiological occlusion and mandibular functional movements without complications through the use of intermaxillary elastics applied via an arch bar.

Conclusion: This case demonstrates that intraoperative internal maxillary artery hemorrhage and associated complications during condylar fracture surgery may necessitate modification of the planned surgical approach. Alternative strategies based on functional rehabilitation can yield successful outcomes. Dynamic intraoperative decision-making not only ensured patient safety but also resulted in satisfactory functional recovery.

Keywords: Functional occlusal rehabilitation; internal maxillary artery hemorrhage; condylar fracture

1. Introduction

Mandibular condylar fractures constitute a significant proportion of all mandibular fractures and are frequently observed, particularly in young adult males. However, major vascular complications occurring during the surgical management of this region have been reported very rarely in the literature[1] . The temporomandibular joint region is located in close proximity to critical neurovascular structures, including the branches of the facial nerve, the auriculotemporal nerve, branches of the external carotid artery system, and the pterygoid muscle groups. In particular, the internal maxillary artery (IMA) is an important vessel that should be considered during the surgical treatment of condylar neck and subcondylar fractures, as it courses medial to the subcondylar region and the concave posterior wall of the mandibular ramus. This close anatomical relationship of the IMA represents an additional risk factor for the surgeon during deep-plane dissection performed through retromandibular, submandibular, and preauricular approaches.[2]

Open reduction and internal fixation of condylar and subcondylar fractures has become increasingly preferred because of its advantages, such as rapid and anatomical restoration of occlusion, preservation of ramus height, and improvement of long-term functional outcomes. Nevertheless, this surgical approach may be associated with complications including facial nerve injury, hematoma, infection, scar formation, and, although rarely, major vascular injury. A limited number of cases of pseudoaneurysm or massive hemorrhage related to the external carotid artery and its branches have been reported, emphasizing the importance of a thorough knowledge of vascular anatomy in condylar surgery.[3]

Intraoperative hemorrhage due to IMA injury is considered a difficult complication to control because of the deep location of the vessel and the need for dissection through surrounding muscular and fascial tissues. Because of its limited response to digital compression, the potential requirement for a wider surgical field, and the risk of massive hematoma formation that may threaten airway safety, timely diagnosis and appropriate surgical or angiographic management are of vital importance. Therefore, in the surgical treatment of mandibular condylar fractures, particularly in highly displaced subcondylar and condylar neck fractures, the course and possible anatomical variations of the IMA should be taken into consideration. This represents a critical step in surgical planning, selection of the incision, and determination of intraoperative dissection strategies.[4]

2. Case Report

A systemically healthy 29-year-old male patient presented to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Uşak University, with limited mouth opening and deviation of the chin to the right following a fall. Based on clinical and radiological examination, surgical treatment was planned with a diagnosis of an isolated left condylar fracture (Fig. 1). The

surgical procedure was performed under general anesthesia using a preauricular approach (Fig. 2).

During the operation, the inferior portion of the fractured fragment, which was displaced medially by approximately 90°, was excised. Subsequently, during mobilization of the condylar head, which remained in situ due to muscular and soft tissue attachments, sudden and massive arterial bleeding occurred from the deep surgical field. Considering the localization and severity of the bleeding, as well as the anatomical relationship of the condylar region with the medial vascular structures, an internal maxillary artery injury was suspected.

Because the deeply located bleeding focus could not be directly visualized, the surgical field rapidly became obscured, and further dissection was considered to increase the risk of additional vascular injury. Therefore, direct vascular ligation or continuation of anatomical reduction was not considered safe. As a result, the planned open reduction and rigid internal fixation procedure was abandoned, and priority was given to achieving hemostasis.

Bleeding control was achieved using topical hemostatic agents and firm tamponade applied to the surgical field. The area was additionally supported externally with a pressure dressing and head bandage. After hemostasis was achieved, the condylar head was left in place, and an alternative treatment approach based on functional rehabilitation was adopted.

In the postoperative period, occlusal guidance was provided using intermaxillary elastics applied via the arch bar that had been placed preoperatively (Fig. 3). Controlled active mandibular exercises were initiated in the early postoperative period after stable hemostasis and occlusal control were confirmed. At the fifth postoperative week, the direction of elastic force was readjusted to guide the mandible toward the target occlusion (Fig. 4). During follow-up, the patient maintained physiological occlusion and achieved clinically adequate mouth opening. Although deviation to the left persisted, no pain or significant limitation in protrusive and lateral mandibular movements was observed (Fig. 5).

3. Discussion

Although internal maxillary artery injuries associated with condylar and subcondylar fractures are rare, they may lead to life-threatening hemorrhage if not promptly controlled. The deep course of the artery within the infratemporal fossa and its close proximity to the medial aspect of the condylar neck increase the risk of injury during both the initial trauma and surgical manipulation of fracture fragments.

Moro et al. reported a rupture of an internal maxillary artery pseudoaneurysm that developed after open reduction and internal fixation of a subcondylar fracture[5]. Cogollo et al. described a pseudoaneurysm identified by computed tomography angiography following profuse bleeding encountered during mandibular fracture surgery, which was successfully treated with coil and glue embolization[6]. Similarly, Słotwińska et al. emphasized that, in bilateral maxillary artery

pseudoaneurysms associated with condylar fractures, direct pressure may be insufficient because of the deep anatomical location of the vessel, highlighting the importance of endovascular treatment[7].

In the present case, sudden and massive arterial bleeding occurred from the deep surgical field during mobilization of the condylar head. Considering the characteristics of the bleeding and its anatomical localization, an internal maxillary artery injury was suspected. Hemostasis was achieved using topical hemostatic agents, firm tamponade, and external compression. Since further dissection was considered to increase the risk of additional vascular injury, the planned rigid internal fixation was abandoned, and functional rehabilitation was preferred.

When the literature and the present case are evaluated together, computed tomography angiography and endovascular embolization should be considered in uncontrolled or recurrent bleeding. However, in cases where hemorrhage can be controlled with local measures, modifying the treatment plan with patient safety as the priority may result in successful functional outcomes.

4. Conclusion

When massive arterial bleeding occurs from the deep surgical field during condylar fracture surgery, injury to the maxillary artery should be considered. The primary priorities should be hemodynamic stabilization, airway safety, and effective hemorrhage control. Rather than attempting to complete the planned surgical procedure under unsafe conditions, intraoperative modification of the treatment plan may represent the most appropriate approach to ensure patient safety.

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6. Figures

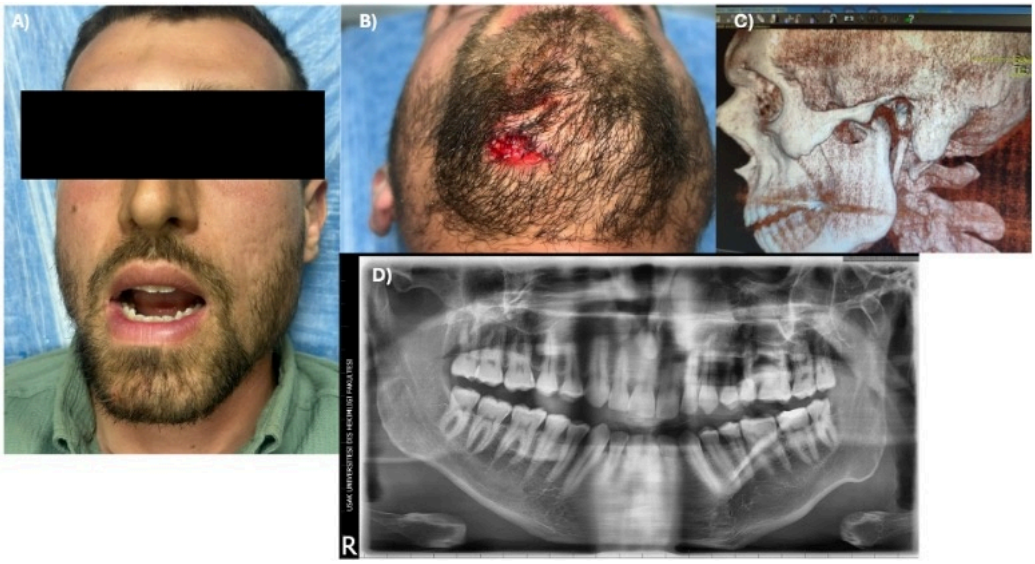

Figure 1. Preoperative clinical and radiological findings.
(A–B) Extraoral clinical appearance.
(C) Sagittal CT image of the left condyle.
(D) Panoramic radiograph.

Figure 2. Intraoperative images.

(A) Pitanguy's line.

(B) Visualization of the superficial temporal vein.

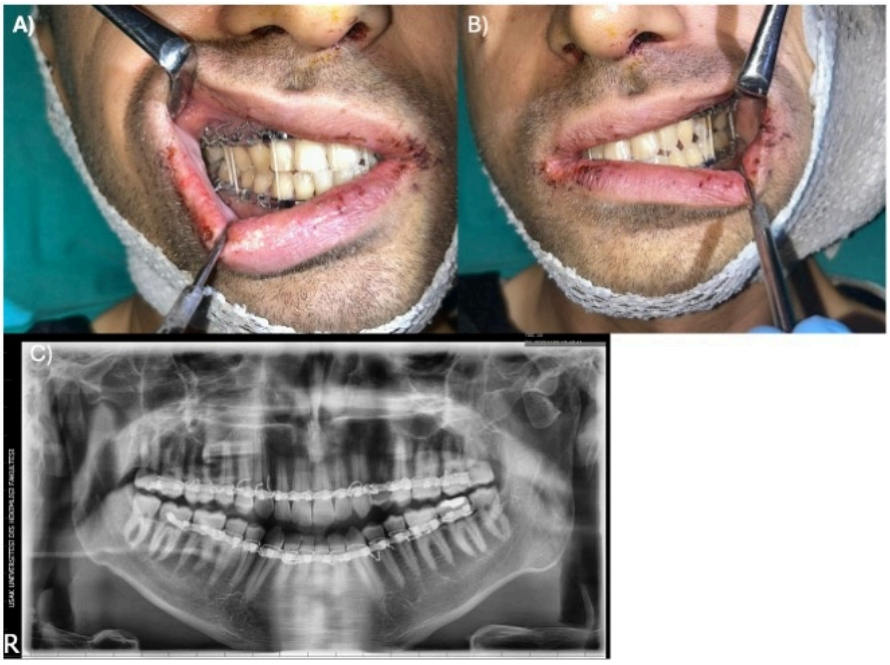

Figure 3. Postoperative third-day findings.

(A) Right lateral view.

(B) Left lateral view.

(C) Panoramic radiograph.

SS-079

Mandibula Patolojik Fraktürlerinde Konservatif Tedavi: Yumuşak Diyetle Yönetilen Bir Olgu ve Literatür Derlemesi

Amaç:

Yaşlı popülasyonda mandibula fraktürleri daha sık görülmekte olup, azalmış vaskülarizasyon ve komorbiditeler nedeniyle kemik iyileşmesi gecikebilmektedir. Bu çalışmanın amacı, ileri yaş hastada akut osteomiyelit ile minimal deplase mandibula kırığının konservatif tedavi ile izlenen klinik seyrini sunmak ve cerrahi olmayan yaklaşımın etkinliğini değerlendirmektir.

Olgu:

Dental implant sökümü sırasında mandibula kırığı gelişen 76 yaşındaki erkek hasta kliniğimize başvurdu. Klinik ve radyolojik değerlendirmede minimal deplase mandibula kırığı ile birlikte akut osteomiyelit tanısı konuldu. Hastada ağrı mevcut olup nörosensöryal hasar saptanmadı ve belirgin deplasman izlenmedi. Bu bulgular doğrultusunda cerrahi olmayan tedavi planlandı.

Tedavi; ilk iki ay sıvı, ardından iki ay yumuşak diyet, fonksiyonel kısıtlama ve medikal tedaviyi içerecek şekilde düzenlendi. Akut osteomiyelit tedavisi için amoksisilin-klavulanat 2 ay süreyle uygulandı. Takiplerde ağrıda azalma ve fonksiyonel iyileşme gözlenirken, okluzal değişiklik veya enfeksiyon izlenmedi. Altıncı ayda hasta asemptomatik olup fraktür hattında komplikasyonsuz iyileşme saptandı.

Sonuç:

Minimal deplase mandibula fraktürleri, uygun hasta seçimi, korunmuş oklüzal ilişkiler ve yakın klinik takip varlığında cerrahi girişime gerek kalmadan başarılı şekilde yönetilebileceği düşünülebilir. Sunulan olgu, konservatif tedavinin enfeksiyon kontrolünün sağlandığı seçilmiş hastalarda etkili ve güvenilir bir seçenek olabileceğine işaret etmektedir.

Anahtar Kelimeler: Mandibula Kırıkları, Osteomiyelit, Dental İmplantlar

Abstract

Objective

Mandibular fractures are more frequently observed in the elderly population, and bone healing may be delayed due to reduced vascularization and the presence of comorbidities. The aim of this study is to present the clinical course of an elderly patient with a minimally displaced mandibular fracture accompanied by acute osteomyelitis, managed conservatively, and to evaluate the effectiveness of the non-surgical approach.

Case

A 76-year-old male patient was referred to our clinic with a mandibular fracture that developed during dental implant removal. Clinical and radiological examinations revealed a minimally displaced mandibular fracture associated with acute osteomyelitis. The patient presented with pain; however, no neurosensory deficit was detected, and no significant displacement was observed. Based on these findings, a non-surgical treatment approach was planned.

The treatment protocol included a liquid diet for the first two months, followed by a soft diet for an additional two months, along with functional restriction and medical therapy. For the management of acute osteomyelitis, amoxicillin-clavulanate was administered for a duration of two months. During follow-up, a reduction in pain and functional improvement were observed, with no signs of occlusal alteration or persistent infection. At the six-month follow-up, the patient was asymptomatic, and uncomplicated healing of the fracture line was confirmed.

Conclusion

Minimally displaced mandibular fractures may be effectively managed without surgical intervention, even when complicated by acute osteomyelitis, provided that appropriate patient selection, preserved occlusal relationships, and close clinical and radiological follow-up are ensured.

Keywords: Mandibular Fractures, Osteomyelitis, Dental Implants

1. Giriş

Yaşlı popülasyonda maksillofasiyal travma insidansının arttığı ve bu travmalar içerisinde mandibula fraktülerinin daha yüksek sıklıkta görüldüğü bildirilmektedir [1]. Diş kaybı ve azalmış vaskülariteye bağlı rezidüel alveolar kemik atrofisi mandibulanın mekanik dayanıklılığını azaltarak fraktür gelişme sıklığını artırmaktadır [2]. Bununla birlikte İleri yaş hastalarda, komplikasyon oranlarının yüksekliği ve iyileşme sürelerinin daha uzun olduğu bildirilmiştir [3].

Mandibula fraktürlerinin cerrahi olmayan (konservatif) tedavisi nadiren tercih edilmektedir [4]. Konservatif tedavi başarısı; klinik ve radyolojik olarak deplasman bulunmaması, yeterli kemik teması, mekanik stabilite, oklüzyonun korunmuş olması, hastanın sistemik durumunun uygunluğu ve tedaviye uyumu ile cerrahın deneyimine bağlıdır [5]. Bu çalışmanın amacı, yumuşak diyet protokolü ile konservatif olarak izlenen ileri yaş bireyde mandibula fraktür ile gelişen akut osteomiyelit olgusunun klinik seyrini sunmak ve cerrahi olmayan tedavi yaklaşımının etkinliğini güncel literatür doğrultusunda değerlendirmektir.

2.OLGU

76 yaşında, sistemik olarak sağlıklı erkek hasta, dental implantın çıkarılması sırasında başka bir merkezde gelişen corpus mandibula fraktürü nedeniyle kliniğimize başvurdu. Yapılan klinik ve radyografik değerlendirme sonucunda, minimal deplase lineer mandibula fraktürü ile birlikte akut osteomiyelit tanısı konuldu.

Tanı; lokalize ağrı, halitozis, fonksiyonel kısıtlılık, fistül yolu varlığı ve pürülan akıntı gibi klinik bulgular ile birlikte panoramik radyografi ve konik ışınlı bilgisayarlı tomografi (CBCT) incelemelerinde izlenen düzensiz radyolusent alanlar ve kortikal bütünlükte bozulma bulgularının birlikte değerlendirilmesiyle konuldu (Şekil 1).

Hastada nörosensöryal hasar saptanmadı. Mevcut oklüzal ilişkiler korunmuş olup yeni gelişmiş maloklüzyon izlenmedi.

Hastanın ileri yaşı, nörosensöryal hasar bulunmaması, oklüzal stabilitenin korunmuş olması ve fraktürün minimal deplase olması nedeniyle cerrahi olmayan tedavi yaklaşımı uygulandı. Tedavi protokolü; ilk iki ay sıvı diyet, takip eden iki ay yumuşak diyet, mandibular fonksiyonların kısıtlanması ve düzenli klinik ve radyolojik takipten oluşturuldu.

Akut osteomiyelit tedavisi kapsamında ampirik antibiyotik tedavisi olarak amoksisilin-klavulanat başlandı. Tedavi başlangıçta intravenöz yolla planlandı ve bir ay süreyle intravenöz amoksisilin-klavulanat 1.2 g (1000 mg amoksisilin / 200 mg klavulanik asit), 12 saatte bir uygulandı. Klinik enfeksiyon bulgularında gerileme gözlenmesi üzerine tedavi oral forma geçilerek bir ay süreyle oral amoksisilin-klavulanat (875 mg / 125 mg, 12 saatte bir) ile sürdürüldü.

Hasta ilk iki hafta boyunca haftada iki kez kontrol edildi ve bu kontrollerde okluzal stabilite, ağrı ve şişlik değerlendirildi. İlk ay sonunda ağrıda azalma ve enfeksiyon bulgularında gerileme gözlenirken, klinik olarak oklüzyon stabil olup mobilite saptanmadı; radyolojik değerlendirmede erken kemik iyileşmesi izlendi (Şekil 2).

İkinci ayda semptomlarda belirgin azalma ve progresif kemik formasyonu gözlendi (Şekil 3). Altıncı ay kontrolünde hasta asemptomatik olup oklüzyon stabil, mandibular fonksiyonlar normaldi. CBCT incelemesinde fraktür hattının komplikasyonsuz şekilde iyileştiği ve kortikal devamlılığın sağlandığı görüldü (Şekil 4).

3.TARTIŞMA

Sunulan olguda fraktürün implantın çıkartılması sırasında meydana gelmiş olması özellikle önemlidir; çünkü endosseöz implantların yerleştirilmesi veya çıkarılması ile ilişkili mandibula fraktürleri literatürde nadir fakat tanımlanmış bir komplikasyon olduğu rapor edilmiştir. Raghoebar ve ark. implant yerleştirilmesi veya sökümü ile ilişkili dört mandibula kırığı olgusu bildirmiş ve atrofik mandibulada yapılan implant tedavisi sırasında ve sonrasında büyük özen gösterilmesi

gerektiğini belirtmiştir [6].Benzer şekilde Meijer ve ark., peri-implant kemik kaybı bulunan atrofik mandibulada implant çıkarımını takiben fraktür gelişebileceğini göstermiştir [7].

İmplantla ilişkili her mandibula kırığının aynı şekilde yönetilmesi doğru değildir; tedavi seçimi kırığın deplasmanı, oklüzyonun durumu, kemik kalitesi ve hastanın sistemik durumu üzerinden yapılmalıdır. Nitekim Ghazal ve ark. yaptığı çalışmada da özellikle cerrahi olmayan tedavinin; klinik ve radyolojik incelemelerde fraktür hattında deplasman bulunmaması, yeterli kemik teması, mekanik stabilite, oklüzyonun korunmuş olması, hastanın sistemik durumunun uygunluğu ve tedaviye uyumu ile cerrahın deneyimine bağlı olduğunu bildirmiştir [5].

Akut osteomiyelit tedavisinde antibiyotik seçimi ve süresi; enfeksiyonun yaygınlığı, etken mikroorganizmalar ve konak faktörlerine göre belirlenmektedir [8]. Osteomyelit tedavisinde Ampirik olarak ko-amoksiklav ile başlanan ve uygun durumlarda mikrobiyolojik bulgulara göre yönlendirilen tedavi yaklaşımı primer tedavide %77 oranında klinik iyileşme sağladığı ve 2 aylık antibiyotik tedavisinin yeterli olabileceği bildirilmiştir [9]. Bu doğrultuda, sunulan olguda amoksisilin-klavulanat tedavisi iki ay süreyle uygulanmıştır. İkinci ay kontrolünde klinik olarak enfeksiyon bulgusu saptanmamıştır. Bu bulgular, uygun hasta seçimi ve yakın klinik-radyolojik takip ile, akut osteomiyelit ile minimal deplase mandibula fraktürlerinde iki aylık antibiyotik tedavisinin yeterli olabileceğini düşündürmektedir bunula birlikte tedavi süresinin hastalığın klinik seyri, enfeksiyon kontrolü ve bireysel konak faktörleri doğrultusunda dinamik olarak belirlenmesi gerektiği dikkate alınmalıdır.

Atrofik mandibula fraktürleri için Ellis, <15 mm mandibulada rijid internal fiksasyon ve gerektiğinde greftleme ile tüm olgularda iyileşme bildirmiştir; bu veri, belirgin atrofi veya instabilite varlığında cerrahinin güçlü bir seçenek olduğunu ortaya koymaktadır [10]. Ancak bu durum tüm olguların zorunlu olarak cerrahiye gitmesi gerektiğini göstermez; özellikle minimal deplase ve oklüzyonu korunmuş fraktürlerde cerrahi olmayan yaklaşım, seçilmiş hastalarda uygulanabilir. Arya ve ark. non-kondiler mandibula fraktürlerinde cerrahi olmayan tedavinin yalnızca **deplase olmayan veya minimal deplase**, oklüzyonu değişmemiş ya da dişsiz hastalarda ve bunula birlikte **katı yumuşak diyet uyumu** sağlanabiliyorsa uygun olduğunu ortaya koymuştur [4]. Yine başka bir çalışmada, cerrahi dışı yönetilen 80 hastanın 69'unda ek cerrahiye gerek duyulmadan tatmin edici sonuç elde edilebileceği gösterilmiştir [11]. Sunulan olguda da oklüzyonun stabil olması, belirgin deplasman bulunmaması, nörosensöryal hasar saptanmaması konservatif yaklaşım için güçlü klinik gerekçelerdir.

4.SONUÇ:

Minimal deplase mandibula fraktürleri, uygun hasta seçimi, korunmuş okluzal ilişkiler ve yakın klinik-radyolojik takip varlığında, akut osteomiyelit ile komplike olgularda dahi cerrahi tedavi yapılmadan başarılı şekilde yönetilebileceği düşünülebilir.

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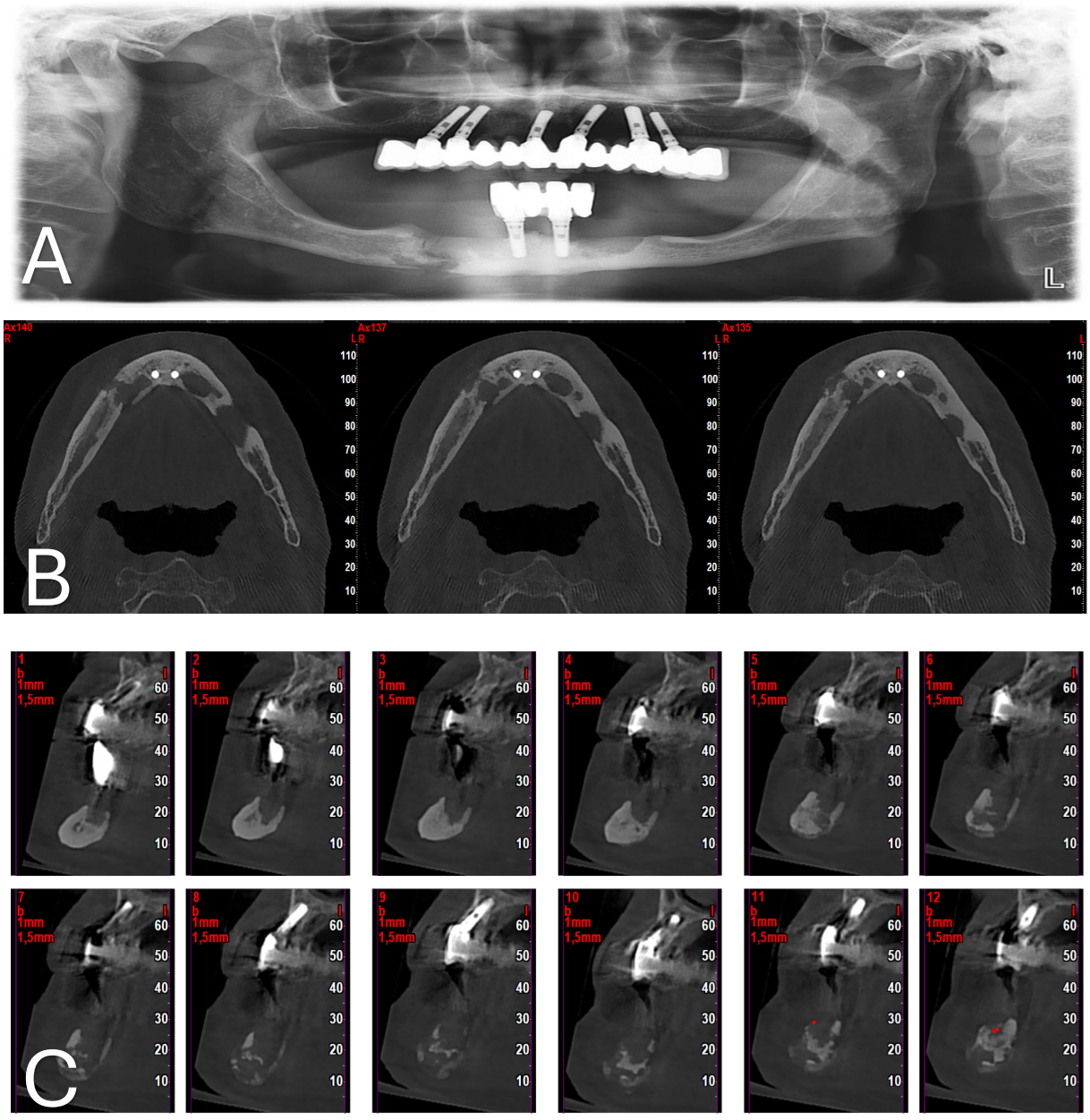
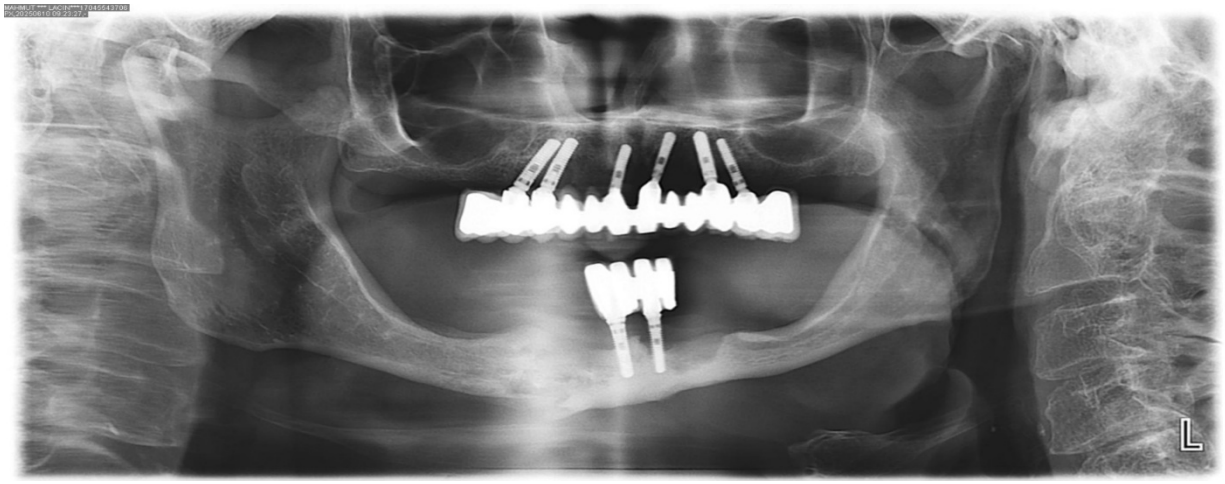
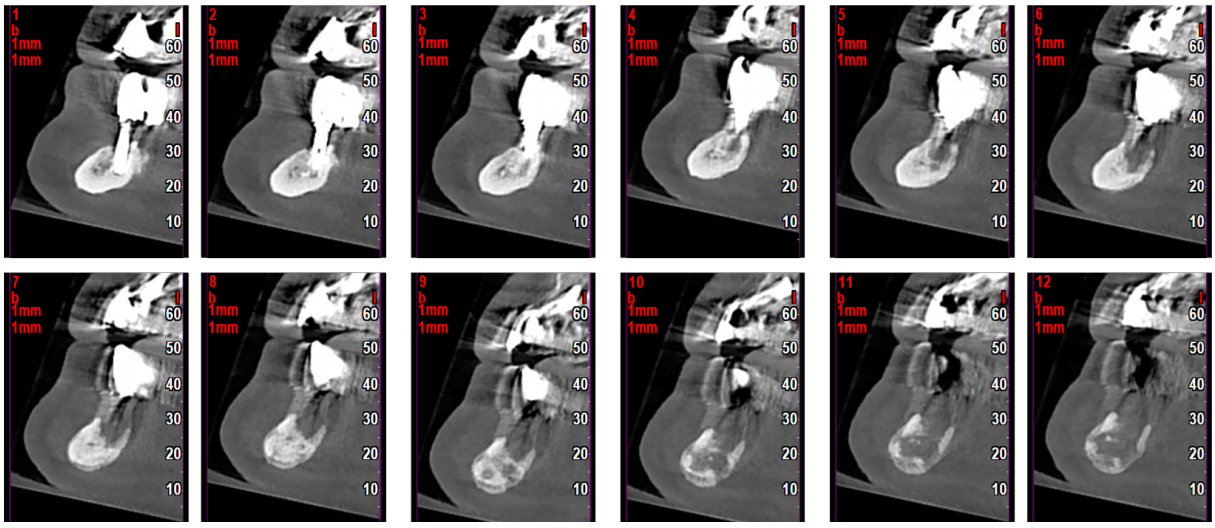
FIGURE LEGENDS



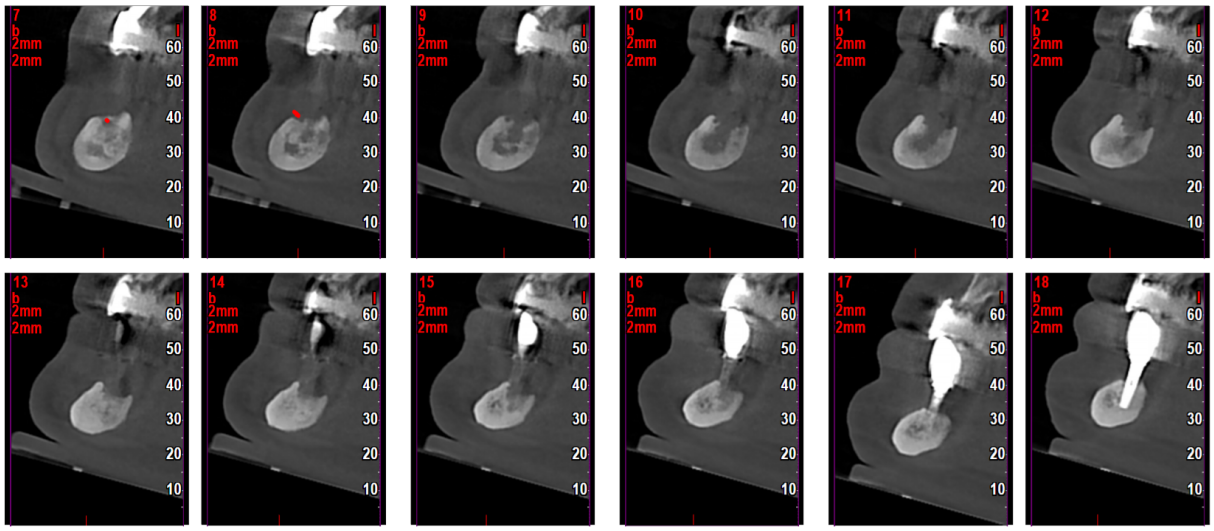
Şekil 1: Şekil 1. Dental implant sökümü sırasında oluşan mandibula kırığının başlangıç radyolojik değerlendirmesi. (A) Panoramik radyografide mandibula korpus bölgesinde minimal deplase lineer fraktür hattı izlenmektedir. (B–C) Konik ışınlı bilgisayarlı tomografi (CBCT) kesitlerinde fraktür hattının minimal deplase olduğu, kortikal devamlılığın kısmen bozulduğu ve belirgin deplasman bulunmadığı görülmektedir.



Şekil 2: Birinci ay kontrolüne ait radyolojik değerlendirme. Radyolojik görüntülerinde fraktür hattı boyunca erken kemik iyileşmesi bulguları izlenmektedir.



Şekil 3. İkinci ay kontrolüne ait radyolojik değerlendirme. CBCT kesitlerinde fraktür hattında progresif kemik formasyonu, trabeküler devamlılığın artması ve fraktür hattının belirgin şekilde silikleştiği görülmektedir.



Şekil 4. Altıncı ay kontrolüne ait radyolojik değerlendirme. CBCT görüntülerinde ve fraktür hattının iyileştiği, kortikal devamlılığın sağlandığı ve defekt bölgesinde belirgin kemik oluşumu ile komplikasyonsuz iyileşmenin tamamlandığı izlenmektedir.

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A Rare Complication in Le Fort I Osteotomy: Trigeminocardiac Reflex (TCR) – Two Case Reports

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Abstract

Objective: Trigeminocardiac reflex (TCR) is a clinical condition characterized by bradycardia, hypotension, and asystole that develops as a result of the stimulation of the trigeminal nerve branches.

Case report: In this case report, the presentation and anesthesia management of two systemically stable young male patients who developed TCR during the maxillary down-fracture maneuver in a Le Fort I osteotomy procedure are discussed in light of the literature. In both patients, the surgical stimulus was immediately interrupted, and hemodynamic stabilization was achieved with atropine administration.

Conclusion: In orthognathic surgeries, it is of great importance that the anesthesia and surgical teams act synchronously and are prepared for a possible TCR scenario.

Keywords: Atropine, Bradycardia, Le Fort I Osteotomy, Maxillary Down-fracture, Trigeminocardiac Reflex

1) INTRODUCTION

Trigeminocardiac reflex (TCR), also known as the trigemino-vagal reflex, is a clinical condition characterized by bradycardia, asystole, and gastric hypermotility, where the afferent pathway is formed by the trigeminal (V) nerve and the efferent pathway is formed by the vagus (X) nerve and sympathetic nerves. Since the first case examples in the literature were observed during ophthalmic surgery, it was termed the

"oculocardiac reflex" in 1908 (1). Following various case reports, it was understood that this clinical picture could be triggered not only by the stimulation of the ophthalmic branch of the trigeminal nerve but also by the stimulation of its maxillary and mandibular branches, thus it was named the "trigeminocardiac reflex" (2).

2) CASE REPORT

2.1) Case 1

The first case is a 20-year-old male patient in the ASA I risk group with no systemic disease. A Le Fort I osteotomy operation was planned for the patient. While the maxillary down-fracture procedure was being performed during the operation, the patient's heart rate suddenly dropped to 30 beats/minute. Upon realizing the situation, surgical manipulation was rapidly interrupted, and intravenous (IV) atropine was administered to the patient. The procedure was resumed in the patient whose peak heart rate returned to normal after atropine administration, and the operation was completed successfully.

2.2) Case 2

The second case is a 21-year-old male patient in the ASA II risk group, who has a history of cleft lip and palate and an inguinal hernia, and had previously been operated on under general anesthesia. In the patient scheduled for a Le Fort I osteotomy, the pulse rate initially dropped to 29 beats/minute during the down-fracture maneuver. When the surgical procedure was interrupted, an improvement in the hemodynamic profile was observed; however, when manipulation was continued, the heart rate dropped again to 32 beats/minute. Following anticholinergic (atropine) administration (atropinization), stabilization was achieved, and the operation was finished without any issues.

2.3) Administered Drugs and Anesthesia Protocol

Standard monitoring for electrocardiography (ECG), non-invasive blood pressure, and oxygen saturation was performed on the patients taken into surgery. Anesthesia induction was provided with 2 mg/kg propofol, 1 mcg/kg fentanyl, and 0.5 mg/kg

rocuronium; both patients were intubated with a size 7 nasotracheal tube. Anesthesia maintenance was achieved with 1–2% sevoflurane, a 50% N_2O/O_2 mixture, and a 0.2 mcg/kg/min remifentanil infusion. Additionally, as a prophylactic measure, 1 g cefazolin and 40 mg pantoprazole were administered to both patients; 8 mg of dexamethasone was administered to the first case, and 16 mg to the second case. For postoperative analgesia, 75 mg diclofenac sodium and 10 mg/kg paracetamol were given, along with 8 mg ondansetron as an antiemetic. At the end of the operation, the neuromuscular block was reversed with 2 mg/kg sugammadex, and extubation was performed. The postoperative period of both patients was uneventful, and no additional complications developed.

3) DISCUSSION

According to various authors, in procedures performed in anatomical regions rich in trigeminal nerve branches, such as orthognathic surgery, anesthetizing the afferent branches in addition to routinely applied local anesthetics and vasoconstrictor agents is highly effective in preventing a TCR episode (3). In the literature review conducted by Yusuf et al. in 2026, it was also reported that TCR in orthognathic surgery frequently occurs during a Le Fort I osteotomy, as a result of the palatal and alveolar branches of the trigeminal nerve being exposed to sudden mechanical stimulation while performing a maxillary down-fracture (4).

The primary rule in the management of a TCR episode is the immediate interruption of the surgical stimulus. If the condition does not improve, anticholinergic (atropine) agents should be administered, and additionally, local anesthesia should be repeated to break the reflex arc. The fact that both cases we presented are young, lack advanced systemic comorbidities, and that the TCR event occurred specifically during the down-fracture shows an exact parallel with the data in the literature (4).

4) CONCLUSION

In operations involving critical manipulations in the maxillofacial region, such as Le Fort I, it is of vital importance that the surgical team acts with extreme caution

while performing the procedure against the risk of TCR, and that the anesthesia team is always prepared for a possible TCR crisis scenario.

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Figure 1. The illustration outlines the clinical pathophysiology of TCR. (1)

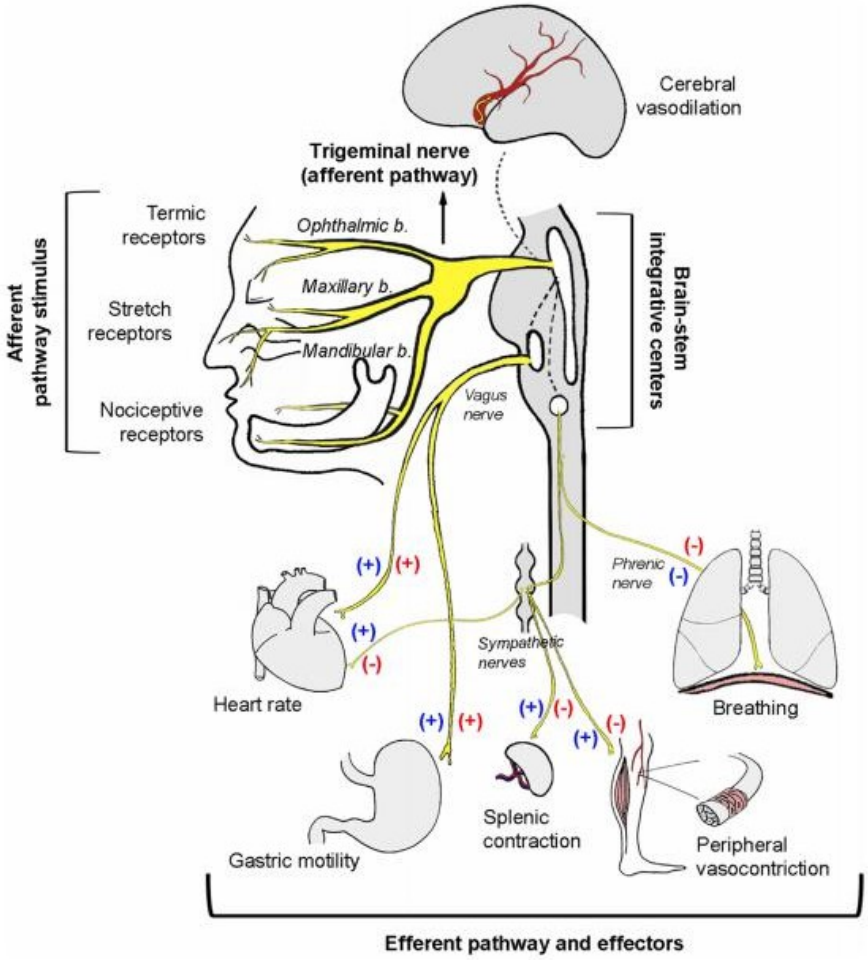
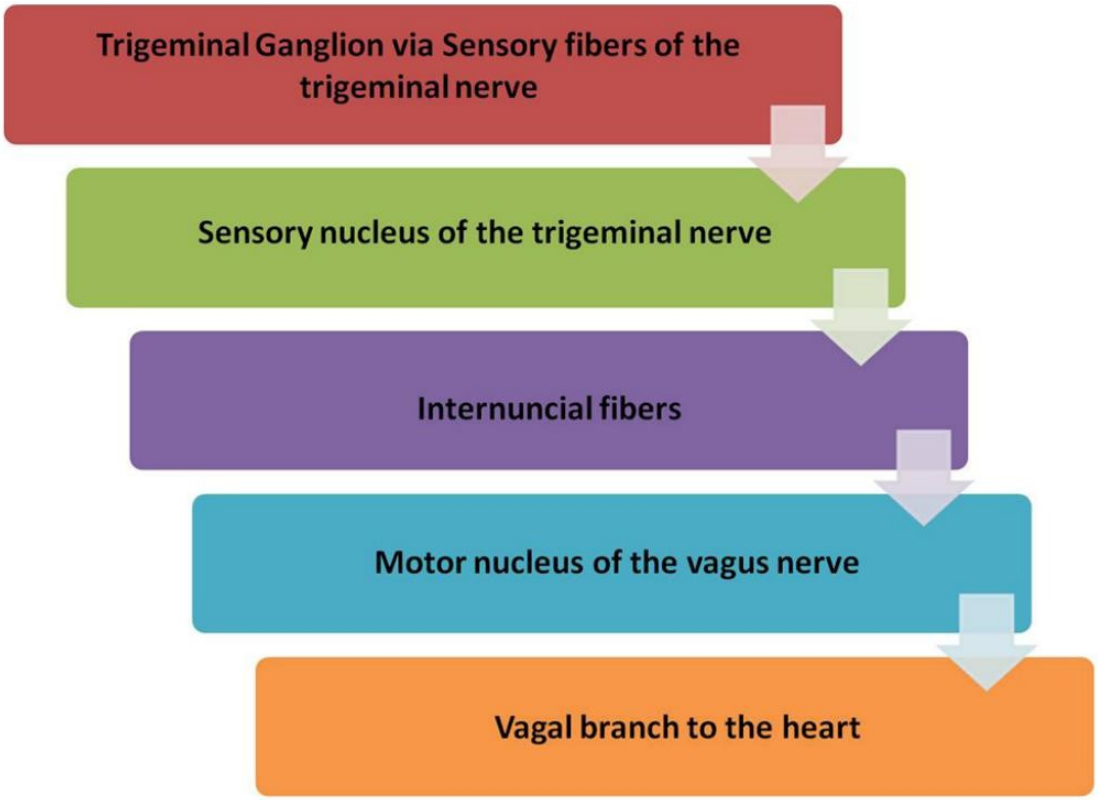


Figure 2. The scheme outlines the clinical pathophysiology of TCR. (2)


Trigeminal Ganglion via Sensory fibers of the trigeminal nerve
Sensory nucleus of the trigeminal nerve
Internuncial fibers
Motor nucleus of the vagus nerve
Vagal branch to the heart

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SS-088

Treatment of Asymmetry Caused by Mandibular Condylar Hyperplasia

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Abstract

Objective: Mandibular condylar hyperplasia is a rare pathology that can lead to progressive facial asymmetry and occlusal disorders. The aim of this study is to evaluate the effectiveness of condylar head arthroplasty in controlling active condylar growth and correcting facial asymmetry through two cases.

Case Report: In this study, two cases diagnosed with mandibular condylar hyperplasia—a systemically healthy 16-year-old male and a 45-year-old female—are presented. In both patients, active growth was confirmed using whole-body Tc-99m MDP bone scintigraphy in conjunction with clinical and radiological evaluations. High condylectomy was performed via a preauricular approach. In the postoperative period, muscle training and functional exercises were applied with intermaxillary elastics to guide the mandible toward the midline. During follow-up, both patients demonstrated significant improvement in facial symmetry, optimal occlusion, and functional recovery.

Conclusion: Condylar head arthroplasty is an effective and reliable treatment option for controlling active growth and correcting facial asymmetry in mandibular condylar hyperplasia. However, treatment success depends on appropriate patient selection, surgical timing, growth potential, and combined approaches with orthognathic surgery when necessary. Postoperative functional rehabilitation and regular follow-up are of great importance for long-term stability.

Key words: Condylectomy, Facial Asymmetry, Mandibular Condylar Hyperplasia

1. Introduction

Condylar hyperplasia is a rare, non-neoplastic pathology first described in 1836 and may be associated with excessive growth of the mandibular condyle. This disorder, which is usually unilateral, leads to facial asymmetry and occlusal disturbances and may be associated with pain and functional impairment (1). It may occur either due to accelerated growth of one of the two condyles during adolescence or continued growth of one condyle after the completion of general skeletal growth in adults. It is generally observed between the ages of 10 and 30, regardless of gender and race (2). In the primary mechanism of its etiology, it has been suggested that prechondroblastic activity, which is the primary growth center, and therefore growth, responds to hormonal stimulation and possesses its own growth potential. Additionally, regional factors such as genetic predisposition, trauma, pericondylar muscles, morphogenic factors, and periodontal proprioception may also be effective (3). In the diagnostic process, in addition to clinical examination, radiological imaging and especially scintigraphic investigations play an important role in the

evaluation of growth activity (4). The treatment approach varies depending on whether the condition is in the active or inactive phase, and orthognathic surgery, condylectomy, or combined approaches are preferred (5).

2. Case Reports

2.1. Case-1

A 16-year-old male patient presented to our clinic with marked facial asymmetry and progressive deviation of the chin to the left over the years. The patient was systemically healthy, and clinical and radiological examinations revealed that despite the mandibular deviation, dental compensation had occurred and an acceptable occlusion between the maxillary and mandibular teeth was present; thus, a preliminary diagnosis of idiopathic condylar hyperplasia was made. Subsequently, in order to confirm the clinical preliminary diagnosis and to assess growth and development status, whole-body Tc-99m MDP bone scintigraphy and hand-wrist radiography were performed, respectively. According to the scintigraphy report, slightly increased activity uptake was detected in the right mandibular condyle, confirming the clinical preliminary diagnosis. Based on the hand-wrist radiograph, the patient was determined to be at the end of or to have just completed the peak growth period. Following the evaluations and patient consultation, high condylectomy of the right mandibular condyle was performed via a preauricular approach. Starting from the first postoperative day, muscle training with intermaxillary elastics was applied for 4 weeks, and mouth opening-stretching exercises were initiated 3 times daily for 5 minutes for 10 days, guiding the mandible toward the midline and preserving mandibular mobility. During muscle training with elastics, while the chin was guided toward the midline, as the patient did not request orthodontic treatment, stability of occlusion was achieved by allowing the teeth to compensate for the newly formed occlusal plane. The patient healed without sequelae and follow-up is ongoing; a marked improvement in facial symmetry was observed. Spontaneous dental compensation to the newly formed occlusal plane is ongoing, and no dietary or phonation problems related to occlusal irregularities were detected.

2.2. Case-2

A 45-year-old female patient presented to our clinic with marked facial asymmetry, deviation of the chin to the left, malocclusion, and its progression over the years. The patient was systemically healthy, and clinical and radiological examinations revealed growth in the right condyle. With a preliminary diagnosis of idiopathic condylar hyperplasia, whole-body Tc-99m MDP bone scintigraphy was performed. According to the scintigraphy report, slightly increased activity uptake was detected in the right mandibular condyle, confirming the clinical preliminary diagnosis. Following the evaluations and patient consultation, high condylectomy of the right mandibular condyle was performed via a preauricular approach. Starting from the first postoperative day, muscle training with intermaxillary elastics was applied for 4 weeks, and mouth opening-stretching exercises were initiated 3 times daily for 5 minutes, guiding the mandible toward the midline and preserving mandibular mobility. During muscle training, it was observed that with the chin guided toward the midline, the teeth achieved an acceptable occlusion, and minimal irregularities improved through spontaneous dental compensation. The patient healed without sequelae, and postoperative follow-up demonstrated a marked improvement in facial symmetry; the patient reported

satisfaction with the aesthetic outcome. No dietary or phonation problems related to occlusal irregularities were observed.

3. Discussion

Condylar head arthroplasty is accepted as an effective surgical method in the treatment of mandibular condylar hyperplasia for controlling active growth and correcting facial asymmetry. Particularly in cases where growth is actively ongoing, the aim is to stop progression by resection of the hyperactive condylar tissue (6).

The most important advantage of condylar head arthroplasty is the direct elimination of the pathological growth center. This approach reduces the risk of recurrence and increases long-term stability compared to orthognathic surgery alone (7). However, the timing of surgery is critical; interventions performed during the active growth period have been reported to yield more successful outcomes (8). In addition, bone scintigraphy plays an important role in identifying the site of active growth and in diagnosis and treatment planning. In Case 1, we did not prefer to delay the operation in the 16-year-old patient whose growth and development were about to be completed, nor to leave the patient with a facial appearance that could negatively affect psychological status. Moreover, we considered it advantageous that the patient was at an age where dental compensation to the altered occlusal plane could occur more rapidly with postoperative muscle training, and this approach has been discussed in the literature (6).

From a functional perspective, condylar head arthroplasty has been shown to preserve mandibular movements, reduce pain if present, and contribute to the correction of occlusal relationships (6,9). However, excessive resection may lead to complications such as decreased ramus height, occlusal instability, and impairment of joint function (9). Therefore, the amount of resection must be carefully determined during surgical planning. We believe that establishing habitual occlusion through the muscle training we recommended is beneficial for maintaining the permanence of the results.

In some cases, condylectomy alone may not be sufficient and may need to be combined with orthognathic surgery. Especially in severe asymmetry and dentofacial deformities, combined approaches provide more aesthetic and functional outcomes (10). Additionally, postoperative orthodontic treatment and physiotherapy are important factors that increase treatment success.

In conclusion, condylar head arthroplasty is an effective and reliable method in mandibular condylar hyperplasia when applied with appropriate indications. However, for optimal results, correct timing, appropriate patient selection, a multidisciplinary approach when necessary, aggressive physical therapy, and muscle training are essential (8,10).

4. Conclusion

Condylar head arthroplasty is an effective and predictable treatment method for controlling growth and correcting facial asymmetry in mandibular condylar hyperplasia. However, long-term success depends not only on accurate indication, meticulous surgical technique, and appropriate treatment planning, but also on factors such as

the patient's age, growth potential, and the need for simultaneous or staged orthognathic surgery. Therefore, the treatment approach should be individualized for each patient, and patients should be followed up in the long term.

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FROM MINIMALLY INVASIVE TO OPEN SURGERY IN THE TREATMENT OF TEMPOROMANDIBULAR JOINT INTERNAL DERANGEMENTS: A CASE SERIES

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Abstract

Objective: Temporomandibular joint (TMJ) internal derangements are one of the most common causes of orofacial pain, and the treatment approach ranges from conservative methods to advanced surgical interventions. The aim of this case series is to evaluate the effects of arthrocentesis, arthroscopy, and open joint surgery on maximum mouth opening and pain in symptomatic TMJ internal derangements.

Case reports: Between 2022 and 2026, 119 patients who underwent arthrocentesis with a diagnosis of internal derangement in our clinic were retrospectively evaluated. Among the 13 patients whose follow-up could be maintained, seven patients showed a significant decrease in pain scores and an increase in maximum mouth opening after arthrocentesis. Of the 7 patients whose symptoms persisted, 2 were excluded from follow-up, and arthroscopic lysis and lavage were performed in the remaining 5 patients. In this group, a decrease in pain scores and functional improvement were also achieved. Open joint surgery was performed in 2 cases that did not respond to minimally invasive treatments, and significant clinical improvement was obtained.

Conclusion: A stepwise approach is an effective strategy in the treatment of TMJ internal derangements. While arthrocentesis and arthroscopy play an important role as minimally invasive treatment options, open joint surgery can provide successful outcomes in resistant cases.

Keywords: Temporomandibular Disorders, Internal Derangement, Treatment Algorithm

1. Introduction

Temporomandibular disorders (TMD) are the most common cause of non-dental orofacial pain (1,2). This term is used to describe disorders involving the temporomandibular joints (TMJ), masticatory muscles, and occlusion, characterized by myalgia, arthralgia, limitation of movement, and joint sounds (3,4). Although TMJ disorders are more frequently observed in women between the ages of 20–40, they are known to occur in all age groups and both sexes. TMD may be accompanied by jaw pain, clicking sounds, limitation in mouth opening, deviation, periodic locking, otalgia, and headache (4–6).

The treatment strategy for TMD includes well-known conservative and invasive methods. In the treatment of TMJ internal derangements, conservative treatment methods are primarily preferred, whereas invasive methods are preferred in symptomatic cases where the desired outcome cannot be achieved (7). Universally, the first preferred invasive approach is intra-articular injection and arthrocentesis. In addition, methods such as arthroscopic

interventions, open joint surgery, and total joint replacement can also be applied (7). It is generally accepted to apply invasive treatments used in the management of internal derangements, including arthrocentesis, arthroscopic lysis and lavage (+/− anterolateral release), and open joint surgery, within an algorithm progressing from simple to complex. The aim of this case series is to evaluate the effectiveness of arthrocentesis, arthroscopy, and open joint surgery on maximum mouth opening and pain in symptomatic patients with TMJ internal derangement.

2. Case Reports

Case Series-1

Between 2022 and 2026, a total of 119 patients diagnosed with temporomandibular joint internal derangement were treated with arthrocentesis in our clinic (Clinical Wilkes Stage II–IV). Detailed data of 13 of these patients were available and the obtained results were analyzed. Arthrocentesis was performed in accordance with the Nitzan method using a pressurized infusion system (8). By placing a double cannula into the superior joint space, distension of the joint capsule and effective elimination of inflammatory contents through irrigation with a minimum of 300 ml of salineat po were aimed. At the end of the procedure, 40 mg of methylprednisolone was injected intra-articularly. One day after the procedure, patients were instructed to perform mouth opening exercises in front of a mirror, three times a day for 5 minutes each, for at least 7 days.

Pain Analysis (VAS):

All data were presented as mean ± standard deviation (mean ± SD).

Preoperative and postoperative VAS scores of the patients are presented in Table 1. The mean preoperative VAS score was calculated as 8.31 ± 1.32, and this value decreased to 5.85 ± 3.07 at the first postoperative week, showing a significant reduction.

Maximum Mouth Opening (MMO):

The maximum mouth opening (MMO) values of the patients are shown in Table 2. The mean preoperative MMO was measured as 25.85 ± 12.79 mm, and this value increased to 29.38 ± 12.91 mm at the first postoperative week.

Case Series-2

Among the 119 patients who underwent arthrocentesis, arthroscopic lysis and lavage were performed in 7 patients whose symptoms persisted; data from 5 of these patients were available and are presented below. Arthroscopic lysis and lavage and anterolateral release were performed under general anesthesia (GA) in 5 female patients with internal derangement who remained symptomatic at least 12 weeks after arthrocentesis, and at the end of the procedure, 40 mg of methylprednisolone was injected intra-articularly. One day after the procedure, patients were instructed to perform mouth opening exercises in front of a mirror, three times a day for 5 minutes each, for at least 7 days.

Pain Analysis (VAS):

Preoperative and postoperative VAS scores of the patients who underwent arthroscopy are presented in Table 3. The mean preoperative VAS score was calculated as 9.2 ± 0.84, and this value decreased to 5.4 ± 2.70 in the postoperative period, showing a significant reduction.

Maximum Mouth Opening (MMO):

The maximum mouth opening (MMO) values of the patients are shown in Table 4. The mean preoperative MMO was 13.2 ± 7.26 mm, whereas this value was measured as 25.8 ± 11.59 mm in the postoperative period.

Case Series-3

Two cases who remained symptomatic at least 12 weeks after arthroscopic lysis and lavage were evaluated for open joint surgery and accepted the operation.

Accordingly, the first case was a 50-year-old healthy female presenting with severe limitation in mouth opening (maximum mouth opening 4 mm) and severe arthralgia in the right TMJ (VAS 10). Under general anesthesia, degenerated and non-functional disc tissue was excised via a preauricular approach (discectomy). Mouth opening exercises were initiated from postoperative day 1, and maximum mouth opening increased to 37 mm, while the VAS pain score decreased to 3. Although translational movement in the operated condyle was limited, the patient reported satisfaction with functional improvement and healing occurred without sequelae.

The second patient was a 28-year-old healthy female presenting with limitation in mouth opening (28 mm) and arthralgia in the right temporomandibular joint (VAS 9). The patient reported that eminectomy and discectomy had been performed on the left TMJ, which is currently asymptomatic, in previous years. Under general anesthesia, the joint was accessed via a preauricular approach and discectomy and eminectomy procedures were performed. Mouth opening exercises were initiated from postoperative day 1, maximum mouth opening increased to 40 mm, and the pain score decreased to VAS 1. Although translational movement in the operated condyle was limited, the patient reported satisfaction with functional improvement and healing occurred without sequelae.

In both cases, while mouth opening increased, the pain score decreased. In carefully selected cases where favorable outcomes cannot be achieved with minimally invasive approaches such as arthrocentesis and arthroscopy, open joint surgery has the potential to be an effective treatment option.

3. Discussion

In temporomandibular disorders (TMD), the treatment approach shows a spectrum ranging from simple to complex surgical methods. In the current literature, it is emphasized that the treatment algorithm should progress in a stepwise manner (4–6). In cases resistant to conservative treatment, the effectiveness of minimally invasive and advanced surgical techniques has gained increasing importance. This case series and our limited experience support that arthrocentesis, arthroscopy, and open joint surgery, when arranged in a treatment algorithm from simple to complex, may be beneficial in providing patient comfort.

Although data from most of our patients could not be accessed, it was observed that patients who underwent arthrocentesis showed a significant decrease in pain scores and a meaningful increase in maximum mouth opening (MMO). In the literature, arthrocentesis has been reported to be effective especially in early and

intermediate stage intra-articular derangement cases, reducing symptoms through the resolution of intra-articular adhesions and removal of inflammatory mediators (7,9).

Although arthroscopy is more invasive compared to arthrocentesis, it is known to allow direct visualization of intra-articular pathologies and targeted intervention (7). Although fibrotic adhesions can be eliminated especially with lysis and lavage procedures, full functional recovery may not be achieved in the presence of advanced disc degeneration or morphological disorders (9). During arthroscopic lysis and lavage, through the anterolateral release of the joint capsule performed under direct visualization and the sweeping performed in the superior joint space with a blunt obturator, along with more effective saline irrigation (700–1000 ml) compared to arthrocentesis, relief that could not be achieved with arthrocentesis was obtained in a limited number of cases.

In the literature, discectomy has been reported to yield successful outcomes especially in advanced-stage degenerative joint diseases and in cases where the disc is non-functional (9,10). The results obtained in both cases are consistent with the literature. The predominance of female patients in our sample is also consistent with the literature. The higher prevalence of TMD in females is associated with hormonal, psychosocial, and biomechanical factors (2,11). This should also be taken into consideration when evaluating treatment outcomes.

4. Conclusion

This study supports the importance of a stepwise approach in the treatment of TMJ disorders. Arthrocentesis stands out as an effective first-line option in early and intermediate stage cases, while arthroscopy can be applied in resistant cases. In selected advanced cases where minimally invasive methods fail, open joint surgery and discectomy ± eminectomy are effective and reliable treatment options in terms of pain control and functional improvement.

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6. Tables

Table 1: VAS scores of patients in case series-1

Patient	Pre-op VAS	Post-op VAS
1	8	3
2	6	1
3	8	5
4	7	2
5	8	5
6	7	4
7	7	3
8	10	8
9	9	9
10	10	10
11	10	8
12	9	9
13	9	9

Table 2: Maximum mouth opening values of patients in case series-1

Patient	Pre-op MMO	Post-op MMO
1	43 mm	40 mm
2	44 mm	50 mm
3	39 mm	45 mm
4	30 mm	39 mm
5	25 mm	30 mm
6	35 mm	39 mm
7	30 mm	36 mm
8	8 mm	15 mm
9	7 mm	8 mm
10	10 mm	15 mm
11	12 mm	16 mm
12	16 mm	20 mm
13	27 mm	29 mm

Table 3: VAS scores of patients in case series-2

Patient	Pre-op VAS	Post-op VAS
1	10	2
2	10	5
3	9	9
4	9	7
5	8	4

Table 4: Maximum mouth opening values of patients in case series-2

Patient	Pre-op MMO	Post-op MMO
1	4 mm	31 mm
2	15 mm	37 mm
3	7 mm	9 mm
4	24 mm	20 mm
5	16 mm	32 mm

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COMPARİSON OF SHORT-TERM CLİNİCAL OUTCOMES OF ARTHROCENTESİS AND CONSERVATİVE TREATMENT İN TEMPOROMANDİBULAR JOİNT DİSORDERS

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Abstract

Introduction: Conservative therapy is considered the first-line treatment for temporomandibular disorders (TMDs), whereas arthrocentesis is recommended for patients with persistent symptoms despite non-invasive management. However, evidence comparing the short-term effectiveness of these treatment modalities remains limited. This study aimed to compare the short-term clinical outcomes of arthrocentesis and conservative treatment in patients with TMDs.

Methods: This retrospective study included 66 patients diagnosed with Wilkes stage II–III TMDs who had not received previous treatment. Patients were allocated to two groups according to the treatment received: Group 1 (arthrocentesis, n = 33) and Group 2 (conservative treatment, n = 33). Maximum mouth opening (MMO), pain intensity assessed using the Visual Analog Scale (VAS), daily life impact score, joint sounds, otalgia, and headache were evaluated at baseline, the 2-week follow-up, and the 2-month follow-up.

Results: Both treatment modalities resulted in significant improvements in pain intensity, daily life impact, and associated clinical symptoms during follow-up. Group 1 demonstrated significantly greater reductions in VAS and daily life impact scores at the 2-month follow-up compared with Group 2 (both p = 0.006). Although MMO increased significantly in Group 1, no significant between-group difference was observed at the 2-month follow-up (p = 0.122). A significant reduction in joint sounds was observed only in Group 1 (p = 0.001), whereas improvements in otalgia and headache were comparable between the groups.

Conclusions: Both arthrocentesis and conservative treatment were effective in improving short-term clinical outcomes in patients with TMDs. However, arthrocentesis provided greater improvements in pain intensity, daily life impact, and joint sounds, suggesting that it may be an effective minimally invasive treatment option for patients with persistent symptoms despite conservative management.

Keywords: Temporomandibular joint, Arthrocentesis, Conservative treatment, Internal derangement

1. Introduction

Temporomandibular disorders (TMDs) comprise a heterogeneous group of conditions affecting the temporomandibular joint (TMJ), masticatory muscles, and associated structures. They are characterized primarily by pain and functional impairment, with restricted mouth opening and joint sounds representing the most common clinical manifestations. These symptoms may substantially compromise patients' daily activities and overall well-being (1,2).

TMDs affect approximately one-third of the adult population, while the reported prevalence among children and adolescents ranges from 10% to 11% (1). Their etiology is multifactorial and is generally regarded as a biopsychosocial process involving the interaction of structural alterations within the joint and masticatory muscles, parafunctional habits, psychological factors, and individual pain responses (3,4).

Current clinical guidelines recommend conservative management as the first-line treatment for TMDs (5,6). Patient education, behavioral modification, physiotherapy, therapeutic exercises, occlusal splint therapy, and pharmacological interventions have been shown to provide effective pain relief and functional improvement in many patients (5,6).

However, persistent pain and functional limitation may occur despite conservative treatment. In such cases, arthrocentesis has emerged as a minimally invasive therapeutic option based on irrigation of the superior joint compartment to remove inflammatory mediators and release intra-articular adhesions (7,8). Although arthrocentesis has been reported to reduce pain and improve maximum mouth opening (MMO), its superiority over conservative treatment remains controversial because comparative studies have produced inconsistent results (7–9).

Furthermore, most comparative studies are limited by low-to-moderate levels of evidence, and data regarding short-term clinical outcomes remain scarce (9,10). Therefore, the present study aimed to compare the short-term clinical outcomes of arthrocentesis and conservative treatment in patients with temporomandibular disorders.

2. Materials and Methods

This retrospective study was conducted by reviewing the clinical records of patients treated for temporomandibular joint (TMJ)-related pain and functional limitation at the Department of Oral and Maxillofacial

Surgery, Faculty of Dentistry, Karadeniz Technical University, between November 2025 and April 2026. Patients aged ≥16 years who had received no previous treatment for TMJ disorders, had no history of rheumatologic disease, had complete follow-up records with at least 2 months of postoperative data, and were diagnosed with Wilkes stage II or III internal derangement were included. Patients with incomplete clinical records or unavailable follow-up data were excluded.

A total of 66 patients met the eligibility criteria and were included in the study. Patients were assigned to two groups according to the treatment modality received. Group 1 consisted of 33 patients who underwent arthrocentesis, whereas Group 2 included 33 patients treated with a standardized conservative treatment protocol comprising pharmacological therapy, dietary modification, occlusal splint therapy, and physiotherapy.

Demographic and clinical data were obtained from the patients' medical records and included age, sex, symptom duration, and the presence of parafunctional habits. Parafunctional habits were defined as bruxism, nail biting, lip biting, and similar oral habits. The mean age of the study population was 41.0 ± 16.1 years (range, 16–78 years). Of the 66 patients, 52 (78.8%) were female and 14 (21.2%) were male. The mean symptom duration was 15.7 ± 20.6 months, and parafunctional habits were identified in 34 patients (51.5%).

Radiological evaluation was performed using magnetic resonance imaging (MRI) and panoramic radiography. Patients were classified according to the Wilkes classification based on radiographic findings.

Patients in Group 1 underwent arthrocentesis under local anesthesia using standard aseptic and antiseptic techniques. All patients were positioned at approximately 45° in the supine position with the head rotated toward the contralateral side. The TMJ region was disinfected with a 10% povidone–iodine solution. A canthotragal line extending from the tragus to the lateral canthus was used to determine the anatomical entry points. Local anesthesia was achieved using an articaine hydrochloride solution containing epinephrine (Ultracain® D-S Forte, Sanofi Aventis). The superior joint compartment was then cannulated, and arthrocentesis was performed by irrigation of the joint space.

Patients in Group 2 received a standardized conservative treatment protocol consisting of pharmacological therapy, dietary modification, occlusal splint therapy, and physiotherapy.

Clinical outcome measures included maximum mouth opening (MMO), pain intensity assessed using the Visual Analog Scale (VAS), daily life impact score, joint sounds, otalgia, and headache. All clinical parameters were evaluated at baseline, the 2-week follow-up, and the 2-month follow-up.

Maximum mouth opening was measured as the maximum interincisal distance between the maxillary and mandibular central incisors using a calibrated ruler and recorded in millimeters. Pain intensity was assessed using a 100-mm Visual Analog Scale (VAS), in which patients rated the pain experienced during mandibular function from 0 (no pain) to 100 (worst imaginable pain). The daily life impact score was evaluated using a 0–100 numeric rating scale, with 0 indicating no impact on daily life and 100 indicating complete interference with daily activities.

Joint sounds were recorded as present or absent based on patient-reported symptoms or clinical findings during mandibular opening and closing movements. Otalgia and headache were assessed during clinical history taking and recorded as present or absent.

Statistical analyses were performed using Jamovi (The Jamovi Project, Sydney, Australia). Depending on data distribution, between-group comparisons were performed using the independent-samples *t*-test or the Mann–Whitney *U* test. Categorical variables were analyzed using the Chi-square test or Fisher's exact test, whereas within-group changes over time were evaluated using the Wilcoxon signed-rank test. Statistical significance was set at $p < 0.05$ for all analyses.

3. Results

The demographic and baseline clinical characteristics of the study groups are presented in Table 1. A statistically significant difference in age was observed between the groups ($p = 0.024$). In contrast, no significant differences were found regarding symptom duration ($p = 0.595$) or sex distribution (Chi-square test, $p = 0.547$; Fisher's exact test, $p = 0.764$). However, parafunctional habits were significantly more prevalent in Group 1 than in Group 2 (Chi-square test, $p = 0.014$; Fisher's exact test, $p = 0.026$).

Descriptive statistics for the daily life impact score, maximum mouth opening (MMO), and Visual Analog Scale (VAS) pain scores are summarized in Table 2. During follow-up, both groups demonstrated reductions in daily life impact and VAS scores, accompanied by improvements in MMO. In Group 1, the mean daily life impact score decreased from 66.7 ± 18.7 at baseline to 17.1 ± 23.7 at the 2-month follow-up, while the mean VAS score decreased from 73.8 ± 25.3 to 12.1 ± 24.0. Group 2 also demonstrated improvements in these parameters, although the magnitude of change was smaller and no substantial improvement in MMO was observed.

Within-group comparisons revealed significant improvements in MMO, VAS, and daily life impact scores across all follow-up time points in Group 1 (all $p < 0.001$). Mean MMO increased from 31.1 mm at baseline to 35.3 mm at the 2-month follow-up, whereas the mean VAS score decreased from 73.8 to 12.1, and the daily life impact score decreased from 66.7 to 17.1. In Group 2, no significant change in MMO was observed (all $p > 0.05$), whereas significant reductions in both VAS and daily life impact scores were detected compared with baseline (both $p <$

0.001). Following Bonferroni correction, the change in the daily life impact score between the 2-week and 2-month follow-up was no longer statistically significant ($p = 0.032$).

Between-group comparisons showed that Group 1 had significantly higher baseline VAS and daily life impact scores and significantly lower MMO than Group 2 (VAS: $p = 0.004$; daily life impact score: $p = 0.031$; MMO: $p < 0.001$) (Table 3). No significant differences in VAS or daily life impact scores were observed at the 2-week follow-up ($p = 0.446$ and $p = 0.633$, respectively). However, both VAS and daily life impact scores were significantly lower in Group 1 at the 2-month follow-up (both $p = 0.006$). Although significant differences in MMO were observed at baseline and at the 2-week follow-up ($p < 0.001$ and $p = 0.001$, respectively), no significant between-group difference remained at the 2-month follow-up ($p = 0.122$).

Comparison of the magnitude of change demonstrated significantly greater clinical improvement in Group 1 than in Group 2 (Table 4). Between baseline and the 2-month follow-up, MMO increased by a mean of 4.18 mm in Group 1, whereas no significant improvement was observed in Group 2 ($p < 0.001$). Likewise, the mean VAS score decreased by 61.67 points in Group 1 compared with 25.76 points in Group 2 ($p < 0.001$). Greater improvement was also observed in the daily life impact score in Group 1 than in Group 2 (49.55 vs. 21.97 points, $p < 0.001$).

Qualitative within-group comparisons of clinical symptoms are presented in Table 5. In Group 1, the prevalence of joint sounds was significantly reduced at both the 2-week and 2-month follow-up compared with baseline ($p = 0.002$), whereas no significant changes were observed in Group 2 (all $p > 0.05$). Both groups demonstrated significant improvements in otalgia and headache compared with baseline (all $p < 0.05$), although no significant differences were observed between the 2-week and 2-month follow-up visits for either symptom (all $p > 0.05$).

Between-group comparisons of qualitative clinical symptoms are presented in Table 6. No significant differences were observed in the prevalence of joint sounds or otalgia at baseline (both $p > 0.05$), whereas headache was significantly more prevalent in Group 2 ($p = 0.015$). During follow-up, the prevalence of joint sounds decreased significantly in Group 1, resulting in significant between-group differences at both the 2-week and 2-month follow-up visits ($p = 0.012$ and $p = 0.001$, respectively). In contrast, no significant between-group differences were observed for otalgia or headache at any postoperative follow-up visit (all $p > 0.05$).

4. Discussion

Conservative treatment is widely accepted as the first-line approach for the management of temporomandibular disorders (TMDs), whereas arthrocentesis is recommended for patients with persistent

symptoms despite appropriate conservative therapy (3,8–10). Recent systematic reviews and meta-analyses have demonstrated that both treatment modalities can improve pain and function; however, the comparative effectiveness of arthrocentesis remains controversial because of heterogeneous study designs and varying levels of evidence (11–13). The present study compared the short-term clinical outcomes of these two treatment approaches in patients with TMDs.

Both treatment groups demonstrated significant improvements in pain intensity, maximum mouth opening (MMO), and daily life impact during follow-up. However, improvements in pain intensity and daily life impact were greater in Group 1. In particular, significantly lower VAS scores at the 2-month follow-up suggest that arthrocentesis may provide superior short-term pain relief compared with conservative treatment. These findings are consistent with those of Thorpe et al. (11), who reported greater pain reduction following arthrocentesis than with conservative management. Similarly, Spadon-Brito et al. (12) concluded that arthrocentesis is an effective treatment option for improving pain and functional outcomes in patients with temporomandibular joint osteoarthritis. The greater reduction in pain observed in Group 1 may be attributed to the removal of inflammatory mediators, reduction of intra-articular pressure, release of adhesions, and restoration of synovial fluid circulation during arthrocentesis. Together, these mechanisms may explain the rapid pain relief observed during the early postoperative period.

Although MMO increased significantly in Group 1, no significant between-group difference remained at the 2-month follow-up. This finding suggests that conservative treatment may also contribute to gradual functional recovery, although improvement appears to occur more slowly than after arthrocentesis. Thorpe et al. (11) reported that arthrocentesis may result in greater improvements in mouth opening than conservative treatment, although these differences are often of limited clinical relevance. Likewise, Simplot et al. (13) emphasized that the benefits of arthrocentesis are generally more pronounced for pain reduction than for improvements in mouth opening. The findings of the present study support these observations and indicate that pain relief may precede measurable functional recovery.

Both groups also demonstrated significant improvements in daily life impact scores, although significantly lower scores were observed in Group 1 at the 2-month follow-up. Chronic TMD-related pain adversely affects mastication, speech, sleep quality, social interaction, and psychological well-being. Therefore, the greater reduction in pain achieved with arthrocentesis may have contributed to improved daily functioning and overall patient well-being. Previous studies have emphasized that successful TMD management should focus not only on pain reduction but also on restoring function and minimizing the impact of the disease on patients' daily lives (4,8).

With respect to qualitative clinical outcomes, a significant reduction in the prevalence of joint sounds was observed only in Group 1. Arthrocentesis may improve joint biomechanics by removing inflammatory mediators, reducing intra-articular pressure, restoring joint lubrication, and releasing intra-articular adhesions, thereby facilitating disc mobility and reducing mechanical joint symptoms (1,4,13). In contrast, although otalgia and headache improved significantly in both groups, no significant between-group differences were observed. Because

these symptoms are multifactorial and may be influenced by muscular dysfunction, psychosocial factors, and central pain sensitization in addition to intra-articular pathology, comparable improvements following both treatment modalities are not unexpected (2,6,8).

The findings of the present study should be interpreted within the multifactorial nature of TMDs. Biological, mechanical, behavioral, and psychosocial factors all contribute to disease development and symptom persistence. Consequently, clinical improvement is likely to result not only from intra-articular intervention but also from patient education, behavioral modification, physiotherapy, occlusal splint therapy, and pharmacological management. These observations are consistent with current clinical guidelines recommending a multidisciplinary, stepwise treatment strategy for TMDs (9,10). Although arthrocentesis demonstrated greater improvements in several short-term outcomes, the favorable response observed in the conservative treatment group further supports its role as the initial therapeutic approach before considering minimally invasive procedures.

The present study has several strengths. All patients were treated at a single institution using standardized diagnostic criteria, treatment protocols, and follow-up assessments, allowing direct comparison between treatment modalities under comparable clinical conditions. Nevertheless, several limitations should be acknowledged. The retrospective design, relatively small sample size, and short follow-up period may limit the generalizability of the findings. In addition, long-term treatment outcomes could not be evaluated because follow-up beyond two months was unavailable. Similar limitations, including heterogeneous diagnostic criteria, variable treatment protocols, and low-to-moderate levels of evidence, have also been reported in previous systematic reviews and meta-analyses (11–13). Therefore, well-designed prospective randomized controlled trials with larger patient populations and longer follow-up periods are needed to confirm these findings and better define the long-term role of arthrocentesis in the management of TMDs.

5. Conclusion

Both arthrocentesis and conservative treatment resulted in significant improvements in pain intensity, functional outcomes, and daily life impact in patients with temporomandibular disorders. However, Group 1 demonstrated greater reductions in pain intensity and daily life impact, while a significant decrease in joint sounds was observed only in this group. Although maximum mouth opening improved following both treatment approaches, no significant between-group difference was detected at the 2-month follow-up.

These findings suggest that arthrocentesis may represent an effective minimally invasive treatment option, particularly for patients with persistent symptoms despite appropriate conservative management. Nevertheless, the results should be interpreted with caution because of the retrospective study design, limited sample size, and short follow-up period. Further well-designed prospective randomized controlled studies with larger patient populations and longer follow-up periods are required to confirm these findings and better define the long-term role of arthrocentesis in the management of temporomandibular disorders.

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7. Tables

Table 1. Demographic and baseline clinical characteristics of the study population.

Variable	Group 1 (Arthrocentesis) N = 33	Group 2 (Conservative treatment) N = 33	Total N = 66	p-value
Age (years), mean ± SD Range	45.5±16.5 (18-78)	36.6±14.5 (16-64)	41.0±16.1	**0.024**
Sex ,n Female Male	25 8	27 6	52 14	0.547
Symptom duration (months), mean ± SD	14.3±15.1	17.1±25.1	15.7±20.6	0.595
Parafunctional habits, n Present Absent	22 11	12 21	34 32	**0.014**

Table 2. Within-group analysis of functional and pain-related parameters using the Wilcoxon signed-rank test.

	Comparison	Group 1 N = 33	Group 2 N = 33
VAS pain score	Baseline – 2-week follow-up	**<0.001**	**<0.001**
	Baseline – 2-month follow-up	**<0.001**	**<0.001**
	2-week follow-up – 2-month follow-up	**<0.001**	**0.009**
Daily life impact score	Baseline – 2-week follow-up	**<0.001**	**<0.001**
	Baseline – 2-month follow-up	**<0.001**	**<0.001**
	2-week follow-up – 2-month follow-up	**<0.001**	0.032
Maximum mouth opening (MMO)	Baseline – 2-week follow-up	**<0.001**	0.398
	Baseline – 2-month follow-up	**<0.001**	0.454
	2-week follow-up – 2-month follow-up	**<0.001**	0.799

Table 3. Between-group comparisons of functional and pain-related parameters using the Mann–Whitney U test.

	Group 1 (Mean ± SD)	Group 1 (Mean ± SD)	*p* value
VAS (Baseline)	73.8 ± 25.3	53.0 ± 26.9	**0.004**
VAS (2-week follow-up)	32.6 ± 22.9	35.3 ± 23.9	0.446
VAS (2-month follow-up)	12.1 ± 24.1	27.3 ± 25.9	**0.006**
Daily life impact score (Baseline)	66.7 ± 18.7	52.1 ± 24.5	**0.031**
Daily life impact score (2-week follow-up)	35.2 ± 24.5	37.0 ± 25.0	0.633
Daily life impact score (2-month follow-up)	17.1 ± 23.7	30.2 ± 23.1	**0.006**
Maximum mouth opening (MMO) (Baseline)	31.1 ± 4.14	37.8 ± 7.46	**<0.001**
Maximum mouth opening (MMO) (2-week follow-up)	33.7 ± 2.57	37.3 ± 5.00	**0.001**
Maximum mouth opening (MMO) (2-month follow-up)	35.3 ± 1.76	37.2 ± 4.42	0.122

Table 4. Between-group comparisons of changes in functional and pain-related parameters using the Mann–Whitney U test.

	Group 1 Mean Change	Group 2 Mean Change	*p* value
VAS (Baseline–2-week follow-up)	41.21	17.73	**<0.001**
VAS (Baseline–2-month follow-up)	61.67	25.76	**<0.001**
VAS (2-week–2-month follow-up)	20.45	8.03	**0.002**
Daily life impact score (Baseline–2-week follow-up)	31.52	15.15	**0.002**
Daily life impact score (Baseline–2-month follow-up)	49.55	21.97	**<0.001**
Daily life impact score (2-week–2-month follow-up)	18.03	6.82	**0.006**
Maximum mouth opening (MMO) (Baseline–2-week follow-up)	+2.58 mm	-0.55 mm	**<0.001**
Maximum mouth opening (MMO) (Baseline–2-month follow-up)	+4.18 mm	-0.58 mm	**<0.001**
Maximum mouth opening (MMO) (2-week–2-month follow-up)	+1.61 mm	-0.03 mm	**0.001**

Table 5. Within-group comparisons of qualitative clinical symptoms using the McNemar test.

	Comparison	Group 1 (*p* value)	Group 2 (*p* value)
Joint sounds	Baseline vs. 2-week follow-up	**0.002**	0.500
	Baseline vs. 2-month follow-up	**0.002**	0.250
	2-week vs. 2-month follow-up	0.625	1.000
Otalgia	Baseline vs. 2-week follow-up	**0.031**	**0.041**
	Baseline vs. 2-month follow-up	**0.008**	**0.016**
	2-week vs. 2-month follow-up	0.289	0.375
Headache	Baseline vs. 2-week follow-up	**0.021**	**0.018**
	Baseline vs. 2-month follow-up	**0.004**	**0.007**
	2-week vs. 2-month follow-up	0.412	0.228

Table 6. Between-group comparisons of qualitative clinical symptoms using the Chi-square test and Fisher's exact test.

		Baseline			2-week follow-up			2-month follow-up		
	Group	**Absent**	**Present**	***p* value**	**Absent**	**Present**	***p* value**	**Absent**	**Present**	***p* value**
Joint sounds	Group 1 (*n* = 33)	16	17	0.458	26	7	**0.012**	28	5	**0.001**
	Group 2 (*n* = 33)	13	20		15	18		16	17	
Otalgia	Group 1 (*n* = 33)	22	11	0.144	26	7	0.284	29	4	0.438
	Group 2 (*n* = 33)	16	17		22	11		27	6	
Headache	Group 1 (*n* = 33)	23	10	**0.015**	27	6	0.179	29	4	0.129
	Group 2 (*n* = 33)	13	20		20	13		25	8	

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SS-094

PATIENT – SPECIFIC MAXILLARY SUBPERIOSTEAL IMPLANT APPLICATION : A CASE REPORT IN A SEVERELY ATROPHIC MAXILLA

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Abstract

Objective:
This study aims to present the clinical application and outcomes of a patient-specific maxillary subperiosteal implant used for the rehabilitation of a severely atrophic maxilla in a completely edentulous patient.

Case:
A 60 year-old male patient with no systemic disease presented to our clinic with complete edentulism. Clinical examination revealed severe maxillary bone resorption. Panoramic radiography demonstrated insufficient vertical bone height for conventional implant placement in the maxilla. Therefore, the patient was referred for cone-beam computed tomography (CBCT) for detailed evaluation.

Based on CBCT findings, placement of six conventional implants in the mandible was planned. For the atrophic maxilla, intraoral scanning and CBCT data were merged to generate a three-dimensional digital model. Using this model, a patient-specific maxillary subperiosteal implant was designed (Custimesh, Turkey).

The patient was operated under general anesthesia, and the subperiosteal implant was placed in the maxilla. In the same surgical session, six conventional implants were placed in the mandible. At the third postoperative month, failure of the 46th implant was observed; the failed implant was removed and immediately replaced with a new implant.

After a 6-month healing period, prosthetic loading was performed, achieving satisfactory functional and esthetic rehabilitation.

Conclusion:

The application of patient-specific subperiosteal implants in severely atrophic maxilla provides a successful, reliable, and predictable treatment alternative when appropriate patient selection and accurate digital planning are performed. This approach eliminates the need for bone augmentation procedures, shortens treatment duration, and enhances patient comfort.

Key words: Subperiosteal implant, atrophic maxilla, patient-specific implant, CAD/CAM, digital planning

1.Introduction

Severe alveolar bone resorption in edentulous patients represents a major clinical limitation for implant-supported rehabilitation in oral and maxillofacial surgery (2). The success of conventional endosseous implants depends on sufficient bone volume and quality, which are often lacking in advanced atrophic jaws (1). To overcome this limitation, various surgical approaches such as autogenous bone grafting and zygomatic implants have been developed.

However, these techniques may lead to increased morbidity, prolonged treatment duration, and complications including infection, graft resorption, and donor site problems (2).

Subperiosteal implants have emerged as an alternative treatment option for patients with insufficient bone volume, eliminating the need for intraosseous anchorage.

These implants are designed as custom frameworks positioned over the bone surface beneath the periosteum and stabilized with fixation screws (4).

Earlier designs showed limited long-term success due to poor fit and biological incompatibility, often resulting in implant exposure and infection. The introduction of titanium significantly improved implant biocompatibility and mechanical stability, leading to more predictable clinical outcomes (1).

Recent advancements in digital technologies have enabled the fabrication of patient-specific subperiosteal implants with improved anatomical adaptation (2).

Additive manufacturing techniques allow the production of complex implant geometries that enhance stability and facilitate prosthetic rehabilitation (1).

Patient-specific subperiosteal implant systems have been proposed as an effective alternative to extensive augmentation procedures in cases of severe maxillary atrophy.

These implants utilize anatomically resistant regions such as the zygomatic and nasomaxillary buttresses to achieve reliable fixation and load transfer (3).

Therefore, customized subperiosteal implants represent a promising solution for restoring function and aesthetics in patients with advanced bone resorption (1)

2. Case Report

A 60-year-old male patient with no systemic disease presented to our clinic with complaints of edentulism and associated functional and esthetic insufficiency. Clinical examination revealed significant alveolar bone loss in the maxilla accompanied by soft tissue resorption. It was determined that the alveolar ridge was severely atrophic and not suitable for conventional implant placement (Figure 1).

Panoramic radiographic evaluation confirmed that the available vertical bone height in the maxilla was insufficient. For a more detailed assessment, the patient was referred for cone-beam computed tomography (CBCT) imaging. CBCT analysis demonstrated severe vertical and horizontal bone loss in the maxilla, whereas sufficient bone volume for implant placement was present in the mandible.

Based on these findings, it was decided to place six conventional implants in the mandible. For the maxilla, due to advanced bone loss, a patient-specific subperiosteal implant was planned as an alternative treatment approach instead of bone augmentation.

Intraoral scan data obtained from the patient were superimposed with CBCT data in a digital environment to create a three-dimensional anatomical model. On this model, a patient-specific subperiosteal implant was designed to achieve optimal adaptation to the maxillary bone (Custimesh, Turkey). Additionally, a surgical guide was planned to increase the accuracy of the surgical procedure (Figures 2–3).

The surgical procedure was performed under general anesthesia. In the first stage, the surgical guide was positioned on the maxilla and stabilized with screws (Figure 4). Controlled bone reduction was performed in six predetermined regions on the guide using piezosurgery to ensure passive and accurate adaptation of the subperiosteal implant to the bone surface (Figure 5). This step was considered a critical stage directly affecting implant stability and long-term success.

After completion of bone reduction, the surgical guide was removed and the patient-specific subperiosteal implant was placed on the maxilla (Figure 6). Implant stabilization was achieved using mini screws. Following fixation of the implant, the buccal fat pad (Bichat's fat pad) was mobilized and adapted over the implant area to obtain a well-vascularized soft tissue layer, reduce tension at the suture line, and minimize the risk of postoperative exposure (Figure 7). In the same surgical session, six conventional dental implants were placed in the mandible (Figure 8).

During the postoperative follow-up period, the patient's healing was regularly monitored. At the third-month follow-up, osseointegration failure was observed in the mandibular implant at position 46; therefore, the implant was removed and replaced in the same session.

After the uneventful completion of the healing process, prosthetic loading was performed at the sixth month. Prosthetic planning had been carried out in the preoperative period as an integral part of the subperiosteal implant design process. Accordingly, the implant was designed considering the positioning of the prosthetic restoration and occlusal relationships. Following the surgical healing period, the prosthetic phase was initiated, and impressions were taken using the open-tray technique to accurately transfer implant positions.

A try-in with a resin prototype was performed to evaluate the accuracy of the prosthetic framework fabricated based on the obtained impressions (Figure 9). At this stage, the patient's vertical dimension, centric occlusion, and esthetic parameters (lip support, tooth arrangement, and smile line) were thoroughly assessed, and necessary clinical adjustments were performed.

During the selection of the restorative material, although monolithic zirconia has high mechanical strength, its relatively heavy weight was considered a potential disadvantage in terms of load transmission to the implant. Therefore, a titanium bar-supported monolithic zirconia superstructure was preferred to achieve more balanced load distribution and enhance biomechanical stability. In the final stage, the prosthesis was placed in the patient's mouth after passive fit verification, and occlusal adjustments were completed, successfully concluding the treatment. As a result of the prosthetic rehabilitation, functional mastication efficiency and esthetic appearance were successfully achieved (Figure 10).

The patient was recalled at the 14th postoperative month for clinical and radiological evaluation. No complications were observed in panoramic radiographs or clinical examination. The patient reported no complaints and no difficulties in daily life (Figures 11–12–13).

3. Discussion

The rehabilitation of patients with severe maxillary atrophy remains a significant clinical challenge, particularly in cases where conventional implant placement is not feasible due to insufficient bone volume.Although augmentation procedures such as autogenous bone grafting may increase bone volume, these techniques are associated with increased morbidity, extended treatment time, and potential complications, which may limit their clinical applicability (2).

In the present case, a patient-specific subperiosteal implant was selected as an alternative treatment approach, allowing rehabilitation without the need for additional augmentation procedures (7).
This approach reduced surgical complexity and overall treatment duration, which is consistent with previous reports highlighting the advantages of subperiosteal implants in managing advanced bone atrophy. Historically, subperiosteal implants were associated with high complication rates due to poor adaptation and limited biological compatibility (1).
However, in the present case, the use of digital planning and CAD/CAM technologies enabled the production of a patient-specific implant with improved anatomical conformity, which facilitated surgical placement and enhanced implant stability (2).

The selection of appropriate anatomical regions for fixation is another critical factor influencing treatment success. In this case, fixation was achieved by engaging the zygomatic and nasomaxillary buttress regions, which are known to maintain sufficient bone density even in severely atrophic maxillae (3).
Utilizing these regions contributes to improved primary stability and effective load transfer to the surrounding bone. Material selection also plays an important role in clinical outcomes.
Titanium remains the preferred material due to its favorable mechanical properties and high biocompatibility, which support long-term implant stability (4).

Despite the favorable short-term clinical outcome observed in the present case, the long-term performance of patient-specific subperiosteal implants remains to be fully clarified .
Further prospective clinical studies with larger sample sizes and longer follow-up periods are required to evaluate their durability and predictability. In conclusion, the findings of this case support the use of patient-specific subperiosteal implants as a viable alternative for the rehabilitation of severely atrophic maxillae.
This approach offers advantages such as reduced surgical morbidity, shorter treatment time, and improved anatomical adaptation, although long-term clinical evidence is still needed to confirm its effectiveness (1).

4. Conclusion

The application of patient-specific subperiosteal implants in severely atrophic maxilla provides a successful, reliable, and predictable treatment alternative when appropriate patient selection and accurate digital planning are performed. This approach eliminates the need for bone augmentation procedures, shortens treatment duration, and enhances patient comfort.

5.References

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6.Figures

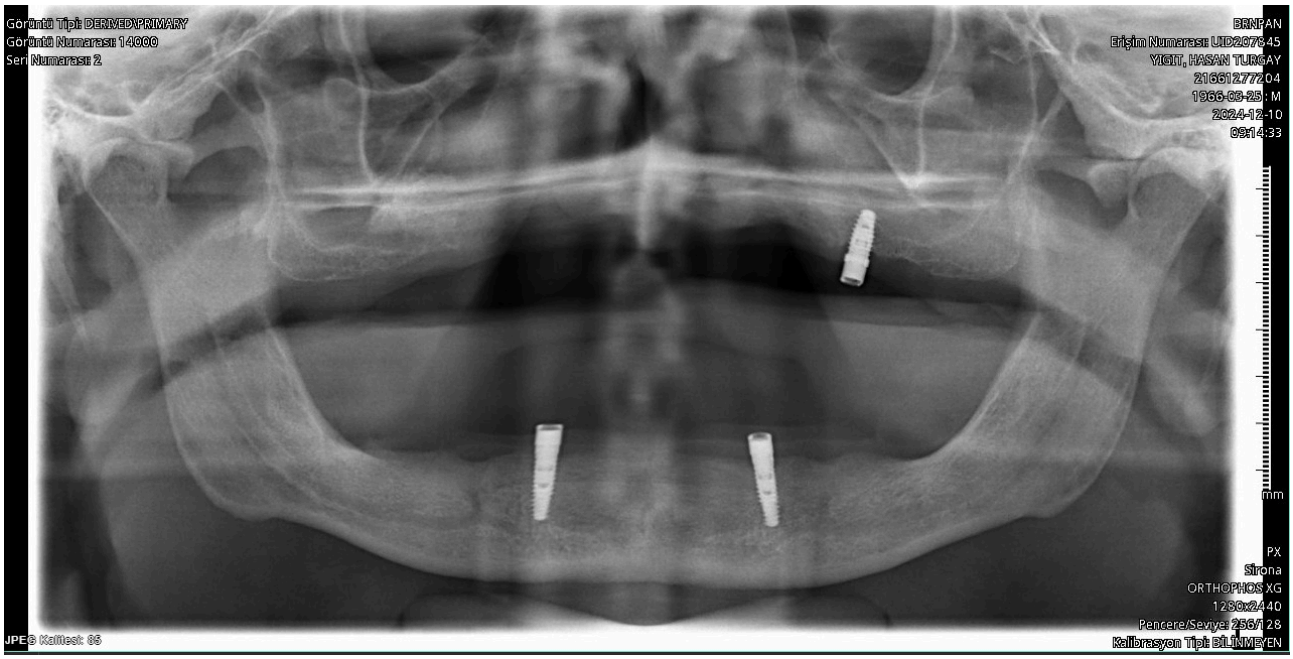

Figure 1 : Preoperative view showing a failed implant in the maxilla and a severely atrophic maxilla.

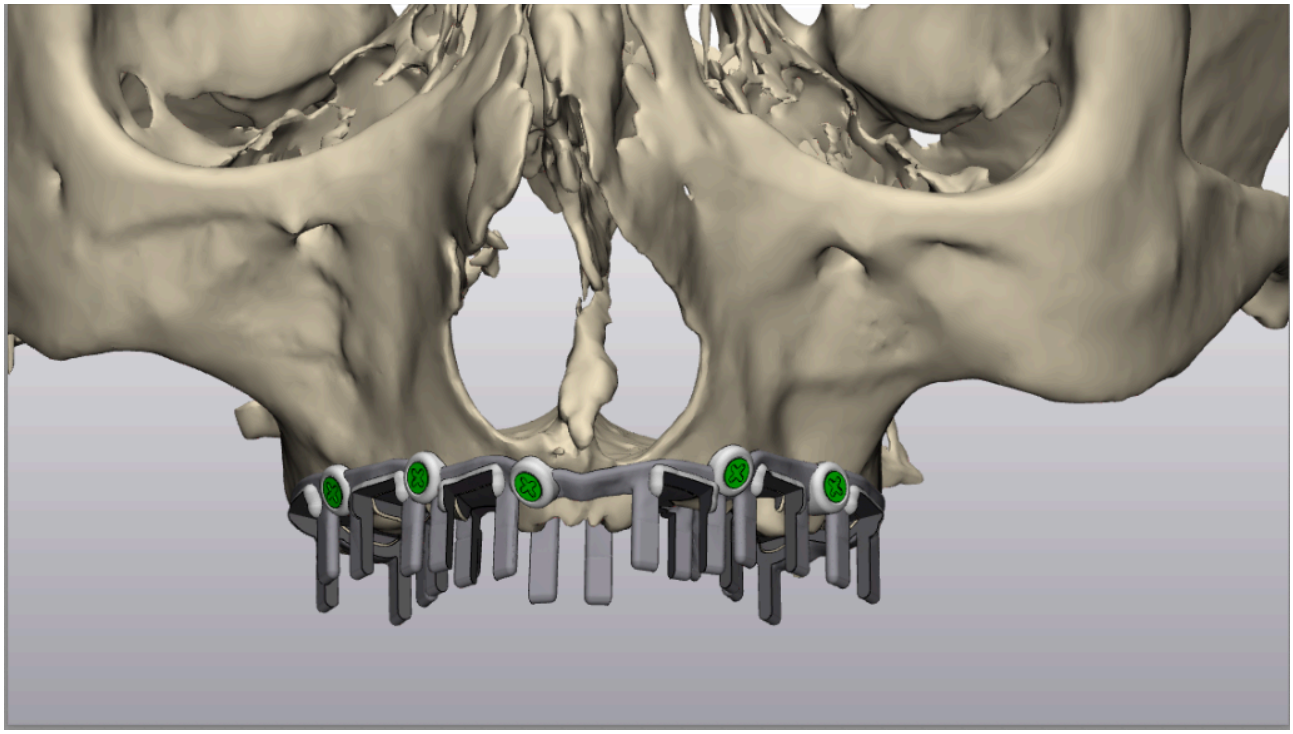

Figure 2 : Surgical guide.

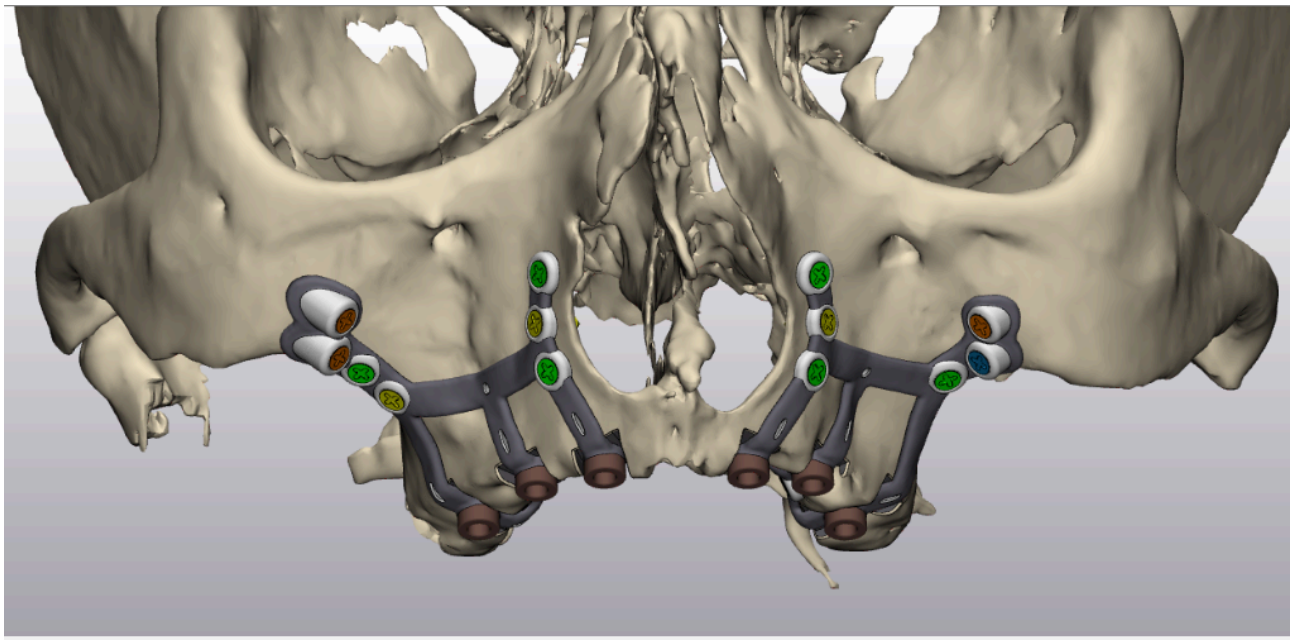

Figure 3 : Design of the patient-specific subperiosteal implant.

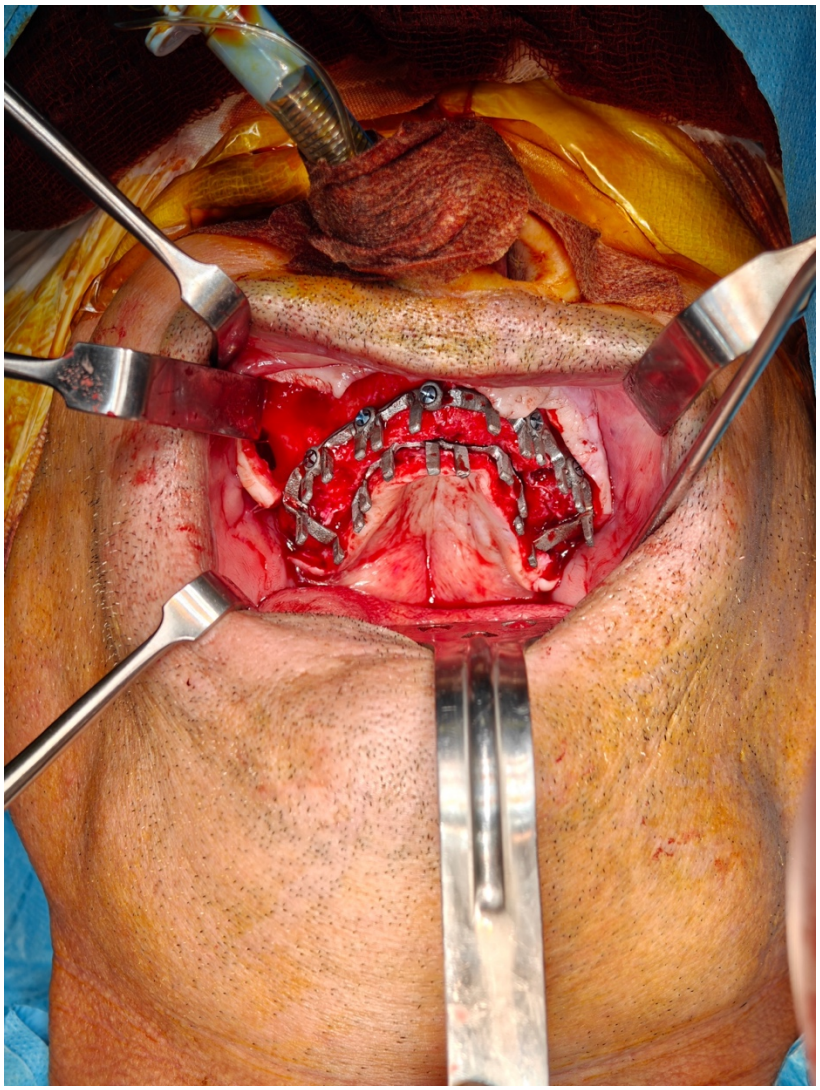

Figure 4: Placement of the surgical guide on the maxilla under general anesthesia.

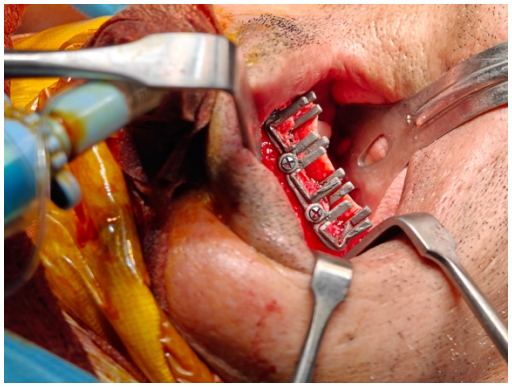

Figure 5: Bone reduction was performed using piezosurgery to allow the abutment to seat more appropriately below the bone level.

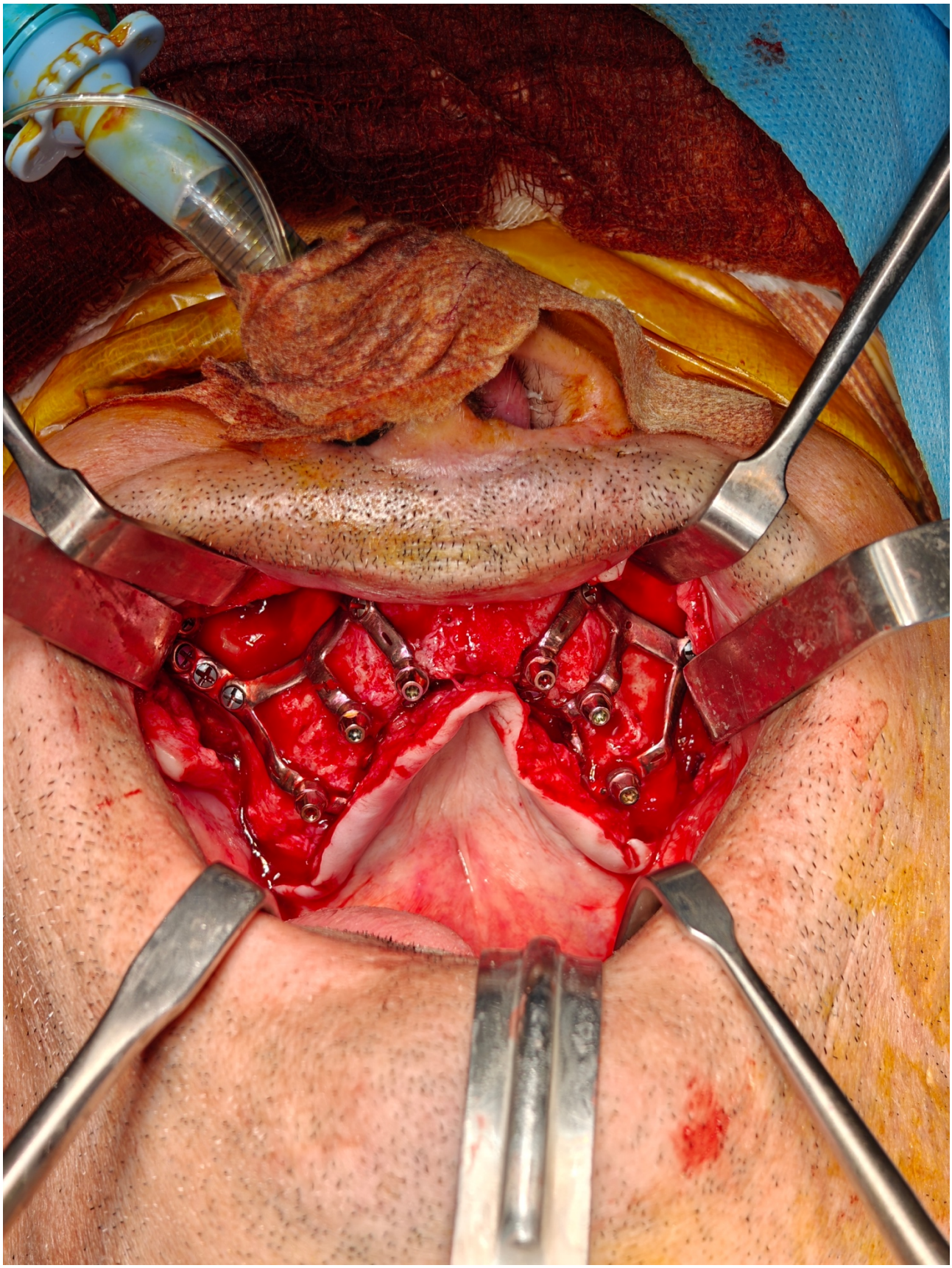

Figure 6: Placement of the subperiosteal implant in the maxilla.

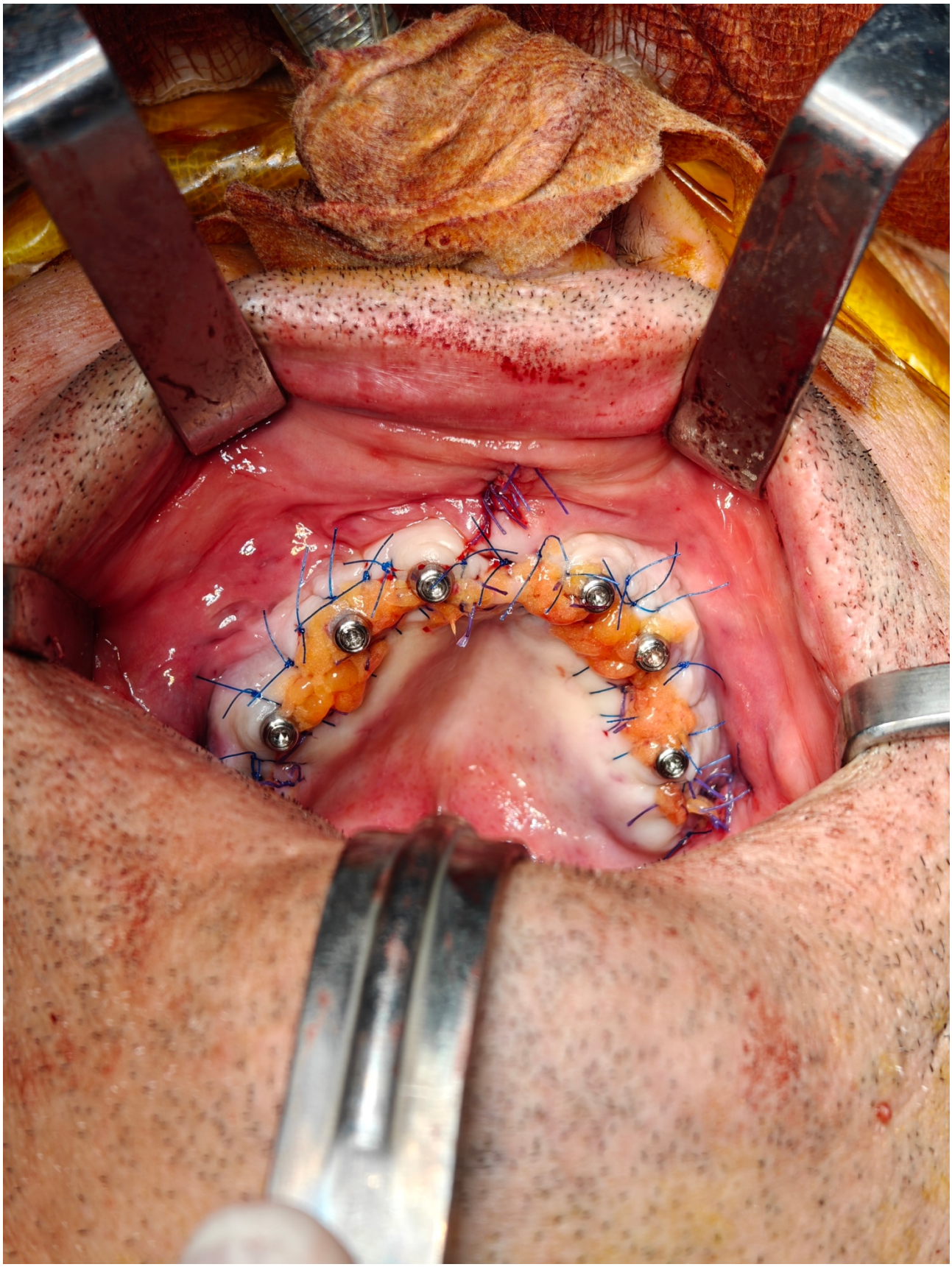

Figure 7: Mobilization and adaptation of the buccal fat pad (Bichat's fat pad) over the surgical site.

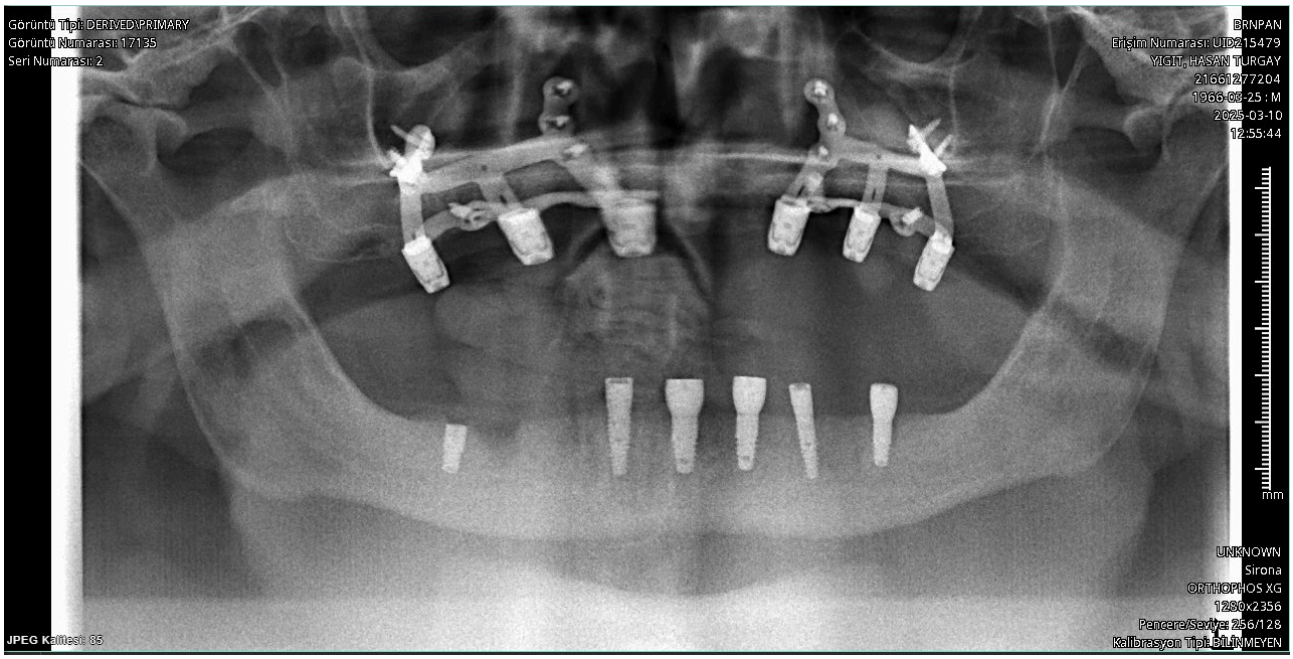

Figure 8 : Postoperative panoramic radiograph showing implants placed in both jaws.

Figure 9 : Evaluation of vertical dimension, centric occlusion, and esthetic parameters during the resin try-in.

Figure 10: Final prosthetic outcome.

Figure 11: Postoperative 14th-month view with occlusion in the closed position.

Figure 12: Postoperative 14th-month smiling view demonstrating satisfactory esthetic outcome and lip support.

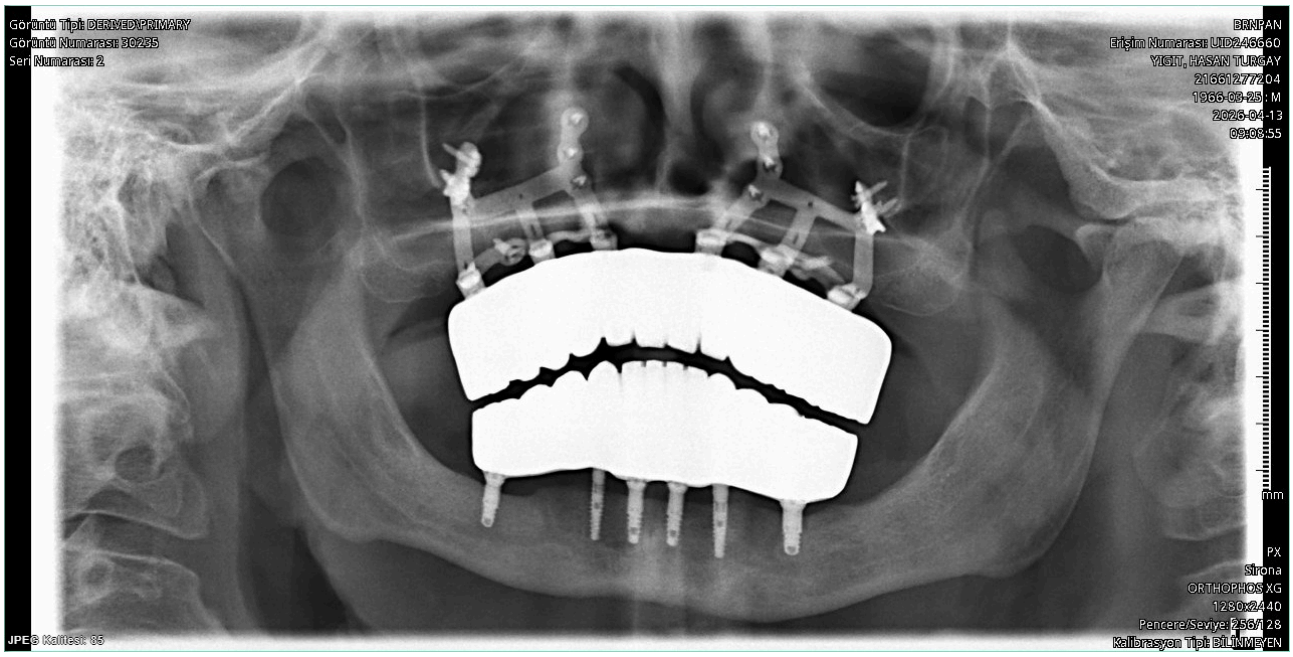

Figure 13: Postoperative 14th-month panoramic radiograph.

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SS-095

Lokal Anesteziye Yetersiz Yanıt Veren Hastada Sedasyon Destekli Full-Arch İmmediat İmplant Rehabilitasyonu: Nadir Bir Klinik Yönetim Olgusu

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Abstract

Objective

Bu olgu sunumunun amacı, lokal anesteziye yetersiz yanıt veren bir hastada intravenöz sedasyon desteği ve dijital iş akışı kullanılarak gerçekleştirilen full-arch immediat implant rehabilitasyonunun klinik yönetimini sunmaktır.

Case

59 yaşında kadın hasta, yaygın diş mobilitesi ve estetik şikayetler nedeniyle kliniğimize başvurdu. Klinik ve radyolojik değerlendirme sonucunda tüm dişlerin çekimi ile her iki çeneye altışar adet dental implant yerleştirilmesi planlandı. İlk cerrahi seansta yüksek doz artikain uygulamasına rağmen yeterli anestezi sağlanamadığından yalnızca çekim işlemleri gerçekleştirildi ve implant cerrahisi ertelendi. Ertesi gün anestezi uzmanı eşliğinde intravenöz sedasyon (midazolam/propofol) altında ikinci cerrahi seans gerçekleştirildi. Sedasyon ve ek lokal anestezi uygulamalarına rağmen intraoperatif ağrı yanıtları ve kooperasyon güçlüğü devam etti. Buna karşın üst çeneye (12,14,16,22,24,26) ve alt çeneye (32,34,36,42,44,46) toplam 12 adet implant başarıyla yerleştirildi. Maksiller posterior bölgede internal

sinüs lift prosedürü uygulandı. 16 numaralı bölge haricindeki tüm implantlarda 45 Ncm primer stabilite elde edildi. Postoperatif dönemde ileri analjezik ihtiyacı nedeniyle intravenöz ağrı kontrolü sağlandı. Ertesi gün hastada sedasyona bağlı anterograd amnezi gözlenirken klinik kooperasyonun belirgin şekilde arttığı izlendi. Geçici protetik

restorasyonların hazırlanması sırasında alınan ayrıntılı anamnezde hastanın çocukluk döneminden itibaren kannabinoid içerikli bitkisel yağ kullandığı öğrenildi. Cerrahi öncesi dönemde bu bilginin mevcut olması halinde genel anestezi seçeneğinin değerlendirilebileceği düşünüldü. Dijital ölçü ve dijital iş akışı kullanılarak geçici sabit restorasyonlar başarıyla uygulandı.

Conclusion

Bu olgu, bazı hastalarda lokal anestezi ve sedasyon desteğine rağmen yeterli intraoperatif analjezinin sağlanamayabileceğini göstermektedir. Cerrahi planlamanın modifiye edilmesi ve multidisipliner yaklaşım, tedavi sürecinin kontrollü şekilde tamamlanmasına katkı sağlamıştır. Ayrıca intravenöz sedasyona bağlı gelişen anterograd amnezi, postoperatif hasta uyumunu artırarak protetik rehabilitasyon sürecini olumlu yönde etkilemiştir. Uzun süreli kannabinoid kullanım öyküsünün anestezik yanıtta değişkenliğe katkıda bulunabileceği düşünülmekle birlikte, bu ilişkinin ileri çalışmalarla desteklenmesi gerekmektedir.

Anahtar Kelimeler: İmmediat implantasyon, lokal anestezi direnci, intravenöz sedasyon,

Introduction

Güncel dental implantolojide çekim ile eş zamanlı implant yerleştirilmesi ve immediat geçici restorasyon uygulamaları, tedavi süresini kısaltması ve estetik beklentileri hızlı şekilde karşılaması nedeniyle giderek daha yaygın kullanılmaktadır (Buser ve ark., 2017). Bu protokollerin başarısı; cerrahi hassasiyet, yeterli primer stabilite ve uygun protetik planlamanın yanı sıra, operasyon süresince sağlanan etkin analjezi ve hasta kooperasyonuna doğrudan bağlıdır (Araujo & Lindhe, 2011).

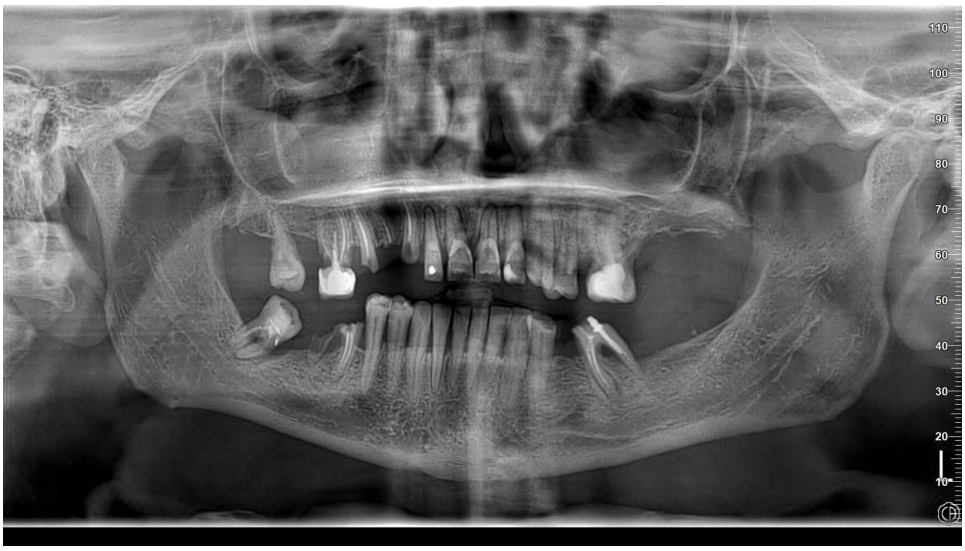
Oral ve maksillofasiyal cerrahi pratiğinde lokal anestezi başarısızlığı çoğunlukla anatomik varyasyonlar, inflamasyon ve düşük doku pH'sı gibi faktörlerle ilişkilendirilmektedir. Bununla birlikte literatürde, sodyum kanal polimorfizmleri ve bireysel nörofizyolojik farklılıklarla ilişkili olabileceği düşünülen "lokal anestezi direnci" olguları da tanımlanmıştır (Meechan, 1999). Bu tür hastalarda yüksek doz lokal anestezik uygulamalarına rağmen yeterli analjezi sağlanamaması; operasyon sırasında istemsiz hasta hareketleri, belirgin kooperasyon güçlüğü ve cerrahi manipülasyonun zorlaşması ile sonuçlanabilmektedir (Gazerani ve ark., 2005).

Sedasyon destekli yaklaşımlar, özellikle midazolam ve propofol kombinasyonu ile sağlanan anterograd amnezi sayesinde cerrahi deneyimin hatırlanmasını azaltarak hasta konforunu artırabilmektedir (Malamed, 2017). Bununla birlikte bazı bireylerde sedasyon altında dahi ağrı algısının devam edebildiği ve anestezik ajanlara verilen klinik yanıtın değişkenlik gösterebildiği bildirilmektedir. Son yıllarda kronik kannabinoid kullanımının sedatif ajan gereksinimini artırabileceği ve ağrı algısını modifiye edebileceği de öne sürülmüştür.

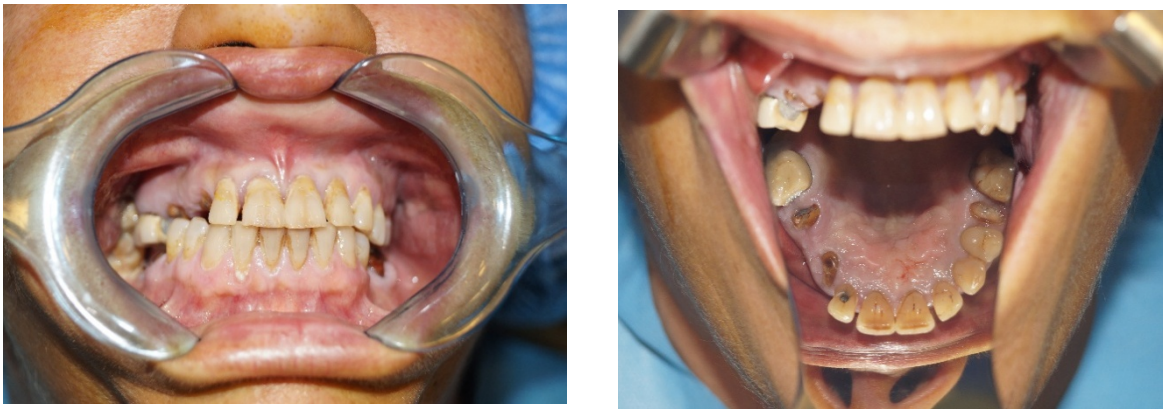
Bu olgu sunumunun amacı; lokal anesteziye ve sedasyon desteğine rağmen intraoperatif ağrı kontrolünde güçlük yaşanan, postoperatif ayrıntılı anamnezinde uzun süreli kannabinoid içerikli bitkisel ürün kullanımı öğrenilen bir hastada, IV sedasyon ve dijital iş akışı eşliğinde tamamlanan full-arch immediat implant rehabilitasyon sürecini sunmaktır.

Case

59 yaşında kadın hasta, yaygın diş mobilitesi, fonksiyon kaybı ve estetik memnuniyetsizlik şikayetleri ile kliniğimize başvurdu. Klinik muayenede özellikle maksilla anterior bölgede ileri derecede mobilite saptanırken, posterior bölgelerde mevcut restorasyonların marjinal uyumsuzluk gösterdiği ve fonksiyonel açıdan yetersiz olduğu gözlendi. Konik ışınlı bilgisayarlı tomografi (CBCT) değerlendirmesi sonucunda tüm dişlerin çekimini takiben maksilla ve mandibulada full-arch immediat implant rehabilitasyonu planlandı. Tedavi planı kapsamında her iki çeneye altışar adet dental implant yerleştirilmesi ve dijital iş akışı ile immediat geçici sabit restorasyon uygulanması hedeflendi.



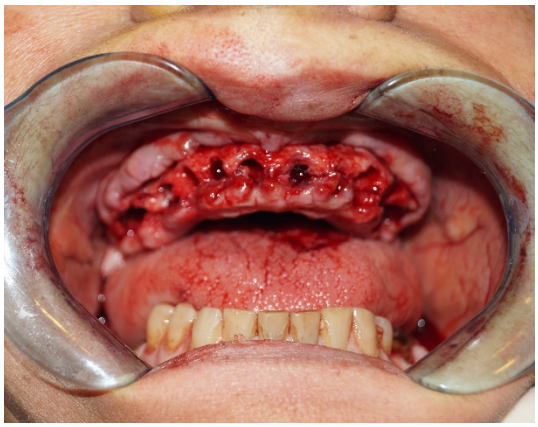
Figür 1. İşlem öncesi panoramik radyografi görüntüsü



Figür 2. İşlem öncesi ağıziçi görüntüler

Cerrahi işleme maksillada bilateral posterior superior alveolar sinir blokları (tuber anestezisi) ile birlikte bukkal ve palatinal infiltratif anesteziler uygulanarak başlandı. Diş çekimleri öncesinde periost elevatörü yardımıyla tam kalınlıkta mukoperiosteal flep kaldırıldı. Toplamda 6 kartuş artikain hidroklorür +

epinefrin (Ultracain DS Forte®) uygulanmasına rağmen yeterli anestezi derinliği sağlanamadı. Hasta işlem sırasında şiddetli ağrı tarif ederken belirgin huzursuzluk ve istemsiz hareketler sergiledi. Yetersiz intraoperatif analjezi ve kooperasyon güçlüğü nedeniyle planlanan implant cerrahisi aynı seansta gerçekleştirilemedi ve yalnızca 11, 12, 13, 14, 15, 16, 18, 21, 22, 23, 24, 25 ve 26 numaralı dişlerin çekimleri tamamlandı.

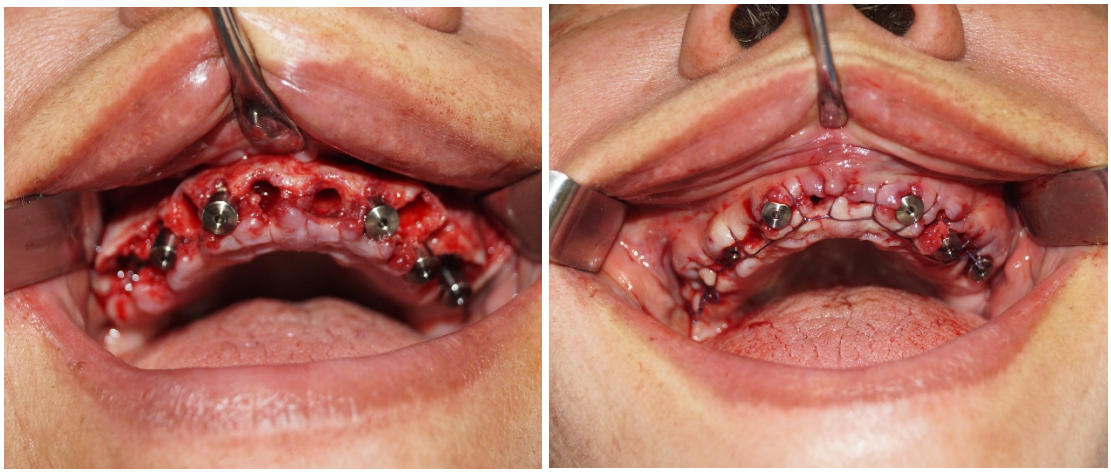


Figür 3. İşlem sırasındaki ağıziçi görüntü

Planlanan implant cerrahisi aynı seansta gerçekleştirilemediğinden, kaldırılan mukoperiosteal flep primer kapama sağlanacak şekilde repoze edilerek 3/0 Pegelak® (poliglaktin 910, sentetik, emilebilir multifilament sütür materyali) ile kapatıldı.

Hastanın hızlı protetik rehabilitasyon talebi doğrultusunda ertesi gün intravenöz sedasyon altında ikinci bir cerrahi seans planlandı. Sedasyon, anestezi uzmanı eşliğinde midazolam (Dormicum®, Roche) ve propofol (Propofol®, Fresenius Kabi) kullanılarak sağlandı. İkinci seansta, bir önceki gün kapatılan flebin sütürleri uzaklaştırılarak mukoperiosteal flep yeniden kaldırıldı. Sedasyon ve ek olarak uygulanan yüksek doz lokal anesteziye rağmen hastanın cerrahi manipülasyon sırasında intraoperatif ağrı hissetmeye devam ettiği gözlendi. Özellikle periost elevasyonu ve implant yuvalarının açılması sırasında belirgin huzursuzluk ve istemsiz hasta hareketleri izlendi. Bu durum cerrahi manipülasyonu zorlaştırmasına rağmen işlem kontrollü şekilde sürdürüldü.

12, 14, 16, 22, 24 ve 26 numaralı diş çekim soketlerinde implant yerleşimi için implant yuvaları açıldı. 26 numaralı bölgede maksiller sinüse yakınlık nedeniyle internal sinüs lift prosedürü uygulandı. Ardından ilgili bölgelere 4.2 mm çapında ve 11.5 mm uzunluğunda dental implantlar (Medigma Biomedical GmbH, Almanya) yerleştirildi. 16 numaralı bölge haricindeki tüm implantlarda 45 Ncm primer stabilite değeri elde edildi. Flep anatomik pozisyonunda repoze edilerek 3/0 Pegelak® sütür ile kapatıldı.



Figür 4. Üst çene implant yerleştirilmesi sonrası ağızıçi görüntüler

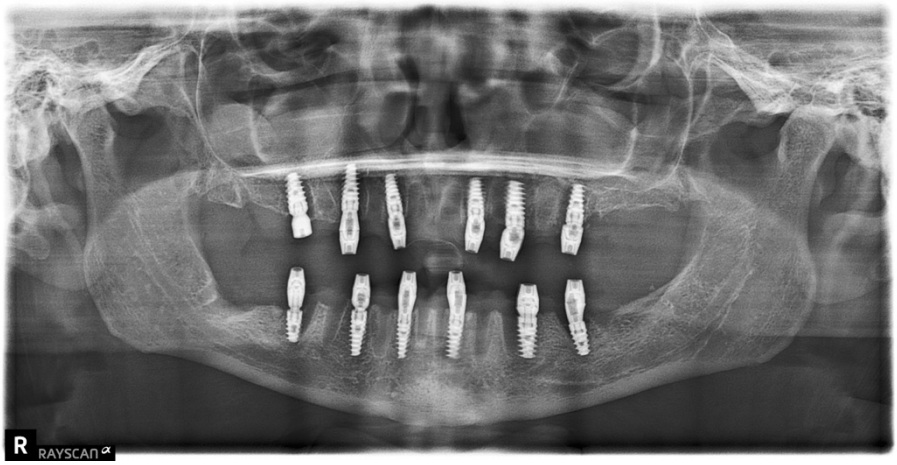
Devam eden ağrı şikayeti ve yetersiz kooperasyon nedeniyle sedasyon derinliği artırılarak mandibular cerrahi aşamaya geçildi. Bu aşamada bilateral inferior alveolar sinir blokları ile birlikte bukkal infiltratif anesteziler uygulandı. Ardından 31, 32, 33, 34, 36, 41, 42, 43, 44, 45, 46 ve 48 numaralı dişler atraumatik şekilde çekildi. Bunu takiben 32, 34, 36, 42, 44 ve 46 numaralı dişlerin çekim soketlerinde implant yerleşimi için implant yuvaları açıldı ve ilgili bölgelere 4.2 mm çapında ve 11.5 mm uzunluğunda dental implantlar (Medigma Biomedical GmbH, Almanya) yerleştirildi. Tüm mandibular implantlarda 45 Ncm primer stabilite değeri elde edildi. Cerrahi alan irrigasyonunu takiben flep anatomik pozisyonunda

repoze edilerek 3/0 Pegelak® sütür ile kapatıldı.

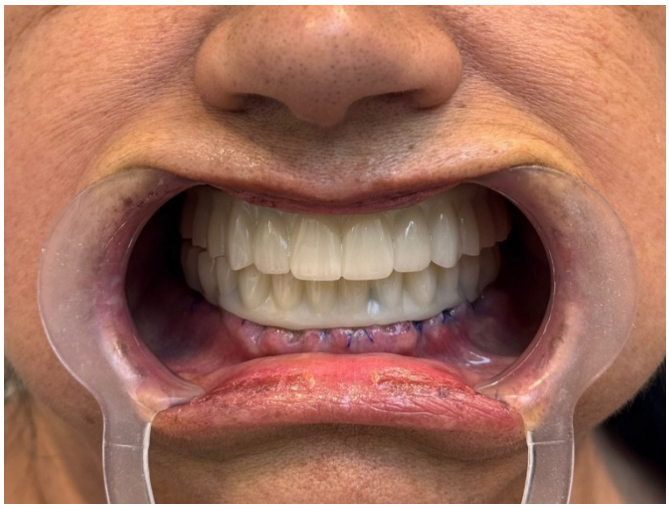
Figür 5. Alt çeneye implant yerleştirilmesi sonrası ağız içi görüntüler

İmmediat geçici restorasyon planı doğrultusunda multi-unit abutmentlar protez hekimi tarafından yerleştirildi. Ancak hasta, sedasyon sonrası erken dönemde dahi şiddetli ağrı tarif etmeye devam ettiğinden ileri analjezik ihtiyacı nedeniyle acil servise yönlendirildi. Acil serviste hastaya intravenöz parasetamol (Aldolan®, Osel) uygulanırken, antibiyotik tedavisi kapsamında klindamisin (Dalacin C®, Pfizer) 600 mg intramüsküler olarak uygulandı. Taburculuk sonrası hastaya amoksisilin + klavulanik asit (Augmentin®), ketoprofen (Bi-Profenid®) ve benzydamin hidroklorür (Andorex®) içeren medikal tedavi reçete edildi.

Ertesi gün gerçekleştirilen kontrol ve dijital ölçü seansı sırasında hastanın, operasyon sürecine ilişkin belirgin anterograd amnezi bildirdiği gözlendi. Aynı seansta alınan ayrıntılı anamnezde, hastanın çocukluk döneminden itibaren kannabinoid içerikli bitkisel bir yağ kullandığı öğrenildi. Cerrahi öncesi dönemde bu bilginin bilinmesi halinde, mevcut anestezik yanıtsızlık olasılığı göz önünde bulundurularak tedavi planında genel anestezi seçeneğinin değerlendirilebileceği düşünüldü. Klinik olarak ise hastada belirgin kooperasyon artışı mevcuttu. Alınan dijital ölçüler doğrultusunda dijital iş akışı kullanılarak geçici sabit restorasyonlar hazırlanmış ve hastaya başarıyla uygulanmıştır.



Figür 6. İşlem sonrası panaromik radyografi görüntüsü



Figür 7. Yapılan sabit geçici protezin ağıziçi görüntüsü

Discussion

İmmediat implantoloji protokollerinde başarı; primer stabilite, cerrahi planlama ve yumuşak doku yönetiminin yanı sıra etkin intraoperatif analjezi sağlanmasına da doğrudan bağlıdır (Jung et al., 2018). Özellikle full-arch rehabilitasyonlarda geniş cerrahi alanların varlığı, lokal anestezi etkinliğini kritik hale getirmektedir (Buser et al., 2017).

Lokal anestezi başarısızlığı çoğunlukla inflamasyon, düşük doku pH'sı ve teknik faktörlerle ilişkilendirilmekle birlikte, bazı hastalarda "lokal anestezi direnci" olarak tanımlanan ve sodyum kanal genetik varyasyonlarıyla ilişkili olabileceği bildirilen nadir klinik durumlar da mevcuttur (Meechan, 2011; Parra et al., 2020). Sunulan olguda yüksek

doz artikain hidroklorür uygulanmasına ve uygun rejyonel blok tekniklerine rağmen yeterli analjezi sağlanamaması, bu olası mekanizmayı düşündürmektedir.

Olgunun dikkat çekici yönlerinden biri, postoperatif protetik aşamada alınan ayrıntılı anamnez sırasında hastanın çocukluk döneminden itibaren kannabinoid içerikli bitkisel yağ kullandığının öğrenilmesidir.

Literatürde kronik kannabinoid kullanımının sedatif ajan gereksinimini artırabileceği, ağrı algısını değiştirebileceği ve anestezik ajanlara verilen klinik yanıtı modifiye edebileceği bildirilmektedir. Özellikle propofol gibi sedatif ajanlara karşı artmış doz gereksinimi çeşitli çalışmalarda gösterilmiş olsa da, lokal anesteziklerin periferik etkinliği üzerindeki etkisi henüz net olarak ortaya konulamamıştır. Bununla birlikte bu olguda yüksek doz lokal anestezi ve intravenöz sedasyona rağmen devam eden intraoperatif ağrı yanıtları, olası kannabinoid maruziyetinin değişmiş analjezik/anestezik yanıt mekanizmalarına katkıda bulunmuş olabileceğini düşündürmektedir. Cerrahi öncesi dönemde bu anamnestik bilginin bilinmesi halinde, tedavi planlamasında genel anestezi seçeneği değerlendirilebilirdi.

Sedasyon destekli yaklaşımlar, özellikle midazolam ve propofol kombinasyonu ile sağlanan anterograd amnezi sayesinde hasta konforunu artırmakta ve cerrahi travmanın hatırlanmasını azaltmaktadır (Malamed, 2017). Bununla birlikte sedasyonun temel olarak anksiyolitik ve hipnotik etki göstermesi nedeniyle analjeziyi tek başına garanti etmediği ve bazı hastalarda ağrı algısının devam edebileceği bildirilmektedir (Dexter & Chestnut, 2021). Sunulan vakada hem lokal anesteziye hem de intravenöz sedasyona rağmen intraoperatif ağrı algısının baskılanamaması, multimodal analjezi gereksinimini ortaya koymaktadır.

Buna karşın hastada sedasyon sonrası gelişen anterograd amnezi, cerrahi deneyimin hatırlanmamasını sağlayarak postoperatif psikolojik adaptasyonu olumlu yönde etkilemiş ve protetik aşamada hasta kooperasyonunu artırmıştır. Bu bulgu, sedasyonun yalnızca intraoperatif konfor değil, aynı zamanda postoperatif hasta davranışı üzerinde de olumlu etkiler oluşturabileceğini göstermektedir (Haas & Lennon, 2020).

Conclusion

Bu olgu, geniş kapsamlı immediat implant cerrahilerinde yeterli lokal anestezi sağlanamamasının tedavi sürecini önemli ölçüde zorlaştırabileceğini ve bazı hastalarda sedasyon desteğine rağmen analjezi kontrolünün yetersiz kalabileceğini göstermektedir. Lokal anesteziklere beklenmeyen yanıtsızlık ve intraoperatif ağrı kontrolündeki güçlük, cerrahi planlamada modifikasyon yapılmasını ve işlemlerin aşamalı olarak tamamlanmasını gerektirmiştir. Ayrıca uzun süreli kannabinoid içerikli ürün kullanım öyküsünün, anestezik yanıtta değişkenliğe katkıda bulunabileceği düşünülmektedir. Buna karşın intravenöz sedasyonun sağladığı anterograd amnezi, hastanın cerrahi süreci hatırlamamasına katkı sağlayarak postoperatif uyumu artırmış ve protetik rehabilitasyon sürecini kolaylaştırmıştır. Bu tür kompleks vakalarda ayrıntılı anamnez alınması, bireyselleştirilmiş anestezi protokolleri ve multidisipliner yaklaşım tedavi başarısında belirleyici rol oynamaktadır.

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TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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33. ULUSLARARASI BİLİMSEL KONGRESİ
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SS-096

SUBPERİOSTEAL IMPLANT APPLOCATION AND EARLY LOADING IN A SEVERELY ATROPHIC MAXILLA: A CASE REPORT

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Abstract

Objective: Severe maxillary atrophy poses a significant challenge for conventional implant rehabilitation due to insufficient bone volume and unfavorable anatomical conditions. Subperiosteal implants, which are currently used to overcome this challenge, fell out of favor with the widespread adoption of intraosseous implants; however, they have recently regained attention owing to advances in imaging and digital manufacturing technologies. This study aims to present the clinical outcomes of a patient treated with a subperiosteal implant in the atrophic maxilla and the all-on-four concept in the mandible.

Case Report: A 55-year-old male patient presented to our clinic with complaints of missing teeth and a desire for implant-supported rehabilitation. Clinical and radiological examination revealed a completely edentulous maxilla and a partially edentulous mandible. The maxilla exhibited severe atrophy, while the mandible demonstrated a knife-edge ridge morphology. Therefore, a subperiosteal implant was planned for the maxilla, whereas the all-on-four concept was considered appropriate for the mandible. Both surgical procedures were performed in the same session under general anesthesia. On the 10th postoperative day, temporary prosthetic loading was carried out following suture removal. The patient was followed up at the 1st and 3rd postoperative months without any complications. Definitive prosthetic rehabilitation is planned for the 6th postoperative month.

Conclusion: In cases of severe maxillary atrophy where conventional implant applications are inadequate, subperiosteal implants provide a reliable and predictable treatment alternative. When this approach is combined with the all-on-four concept applied in the mandible, it enables the rapid restoration of esthetics and function through appropriate case selection and meticulous surgical planning.

Key words: Atrophic maxilla, Early loading, Subperiosteal implant

1. Introduction

First described by Gustav Dahl in the 1940s, subperiosteal implants are an alternative implant system placed on the surface of the alveolar bone beneath the periosteum, primarily indicated in cases of severe bone resorption where endosseous implant placement is not feasible.(1) However, with the widespread adoption of endosseous implants and the concept of osseointegration in recent decades, the clinical use of these implants has markedly declined over time.(2) Nevertheless, recent advancements in computed tomography (CT), direct metal laser sintering, and computer-aided design/computer-aided manufacturing (CAD/CAM) technologies have renewed interest in patient-specific subperiosteal implants.(3, 4) With current technological capabilities, it has become possible to design and manufacture customized implants that conform precisely to the patient's anatomical structures. These ongoing technological developments provide an opportunity to revisit and refine older concepts such as subperiosteal implants. Consequently, they have emerged as a promising alternative treatment option in cases where conventional endosseous implant placement or augmentation procedures are not feasible.(5) In this case report, the clinical outcomes obtained through the simultaneous application of a subperiosteal implant in the severely atrophic maxilla and the all-on-four concept in the mandible in the same patient are presented, together with the contribution of early prosthetic loading to the rapid restoration of esthetics and function.

2. Case Report

A 55-year-old male patient presented to our clinic with complaints of missing teeth and a desire for implant rehabilitation. Clinical and radiological examinations revealed a completely edentulous maxilla and a partially edentulous mandible. The patient's medical history was noncontributory, with no systemic comorbidities reported. Detailed evaluation of the alveolar ridges demonstrated severe atrophy of the maxillary ridge and a knife-edge morphology of the mandibular ridge. According to the Cawood–Howell classification, the maxilla was classified as Class V and the mandible as Class IV.

Soft tissue assessment of the maxilla revealed an adequate amount of attached gingiva and the presence of a thick gingival phenotype. The width of the keratinized mucosa and tissue thickness were considered favorable for the stability and long-term tissue compatibility of the planned subperiosteal implant. Due to the differing degrees of resorption between the maxilla and mandible, jaw-specific treatment approaches were adopted during treatment planning. Accordingly, a subperiosteal implant was planned for the maxilla, whereas the all-on-four concept was considered appropriate for the mandible.

Initially, a radiopaque complete denture containing barium sulfate was fabricated by the Department of Prosthodontics. CT images obtained while the patient was wearing these prostheses were then transferred to the manufacturer (Biotechnica Engineering®), and the digital planning process was initiated. This approach enabled the determination of the vertical dimension as well as the design of the subperiosteal implant and the positioning of the abutments according to the planned tooth arrangement. In addition, the surgical bone reduction guide, the position of the subperiosteal implant on the bone surface, existing bone thicknesses, the fixation screw insertion sites, and the diameters and lengths of the screws were planned in detail.

Following digital planning, a prototype of the designed structure was fabricated to evaluate its fit, and no incompatibility was detected. Subsequently, the surgical bone reduction guide and the right and left maxillary subperiosteal implants were manufactured. Straumann® multi-unit abutments were used in the prosthetic suprastructure of the subperiosteal implant, whereas the Medentika® implant system was preferred for the all-on-four concept. Both surgical procedures were performed simultaneously under general anesthesia. Temporary prosthetic loading was completed on the 7th postoperative day. The patient was followed regularly at the 1st and 3rd months, and no complications were observed. Definitive prosthetic rehabilitation is planned following a 6-month healing period.

3. Discussion

Subperiosteal implants may represent a valuable alternative to advanced surgical procedures in cases where the placement of conventional intraosseous implants and augmentation techniques is not feasible. In addition to being successfully applicable in both jaws, these implants can also be combined with the all-on-four concept supported by intraosseous implants, as demonstrated in our case.(6) In the past, limitations in prosthetic impression techniques, imaging modalities, and implant–bone incompatibility, as well as complications such as implant exposure, were associated with high complication rates, resulting in restricted clinical use of these implants. However, recent advances in CT and CAD/CAM technologies have enabled the fabrication of patient-specific subperiosteal implants with high precision.(7) This development improves the adaptation of the implant to the bony surface, thereby enhancing biomechanical stability and reducing the risk of complications.(8)

Although the high manufacturing and application costs are considered a disadvantage, some studies have suggested that this approach may be more cost-effective when compared with alternative advanced surgical interventions, particularly when success rates are also taken into consideration. Careful evaluation of anatomical structures during the planning phase and protection of surrounding tissues during the placement of reduction and fixation screws throughout the surgical procedure contribute to the prevention of potential complications.(9) Reported complications associated with subperiosteal implant applications include material fatigue-related fractures, implant exposure, peri-implantitis, insufficient osseointegration, and implant mobility.(3, 10) None of these complications were observed during the follow-up period in our case. Nevertheless, larger-scale studies with longer follow-up periods are still required to more comprehensively evaluate the long-term success and reliability of this technique.

4. Conclusion

In cases of advanced jaw atrophy where conventional implant placement and augmentation procedures are insufficient, subperiosteal implants offer a valuable alternative with effective and predictable outcomes. With appropriate case selection and meticulous treatment planning, this approach can provide functional and aesthetic rehabilitation within a relatively short period. Due to the presence of varying degrees of resorption in the maxilla and mandible, jaw-specific treatment strategies were adopted, and a combination of a subperiosteal implant and the all-on-four technique was utilized, resulting in successful clinical outcomes in full-arch rehabilitation. The findings obtained from the present case suggest that this approach may represent a feasible and effective treatment option for severely atrophic jaws; however, further long-term clinical studies are required to support these outcomes.

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6. Figures

Figure 1: Preoperative radiological image

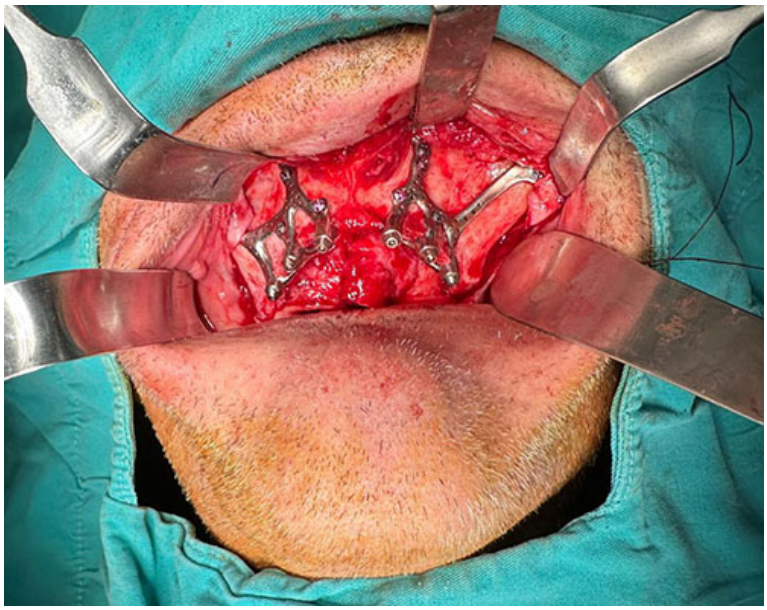

Figure 2: Intraoperative view of maxillary subperiosteal implant placement

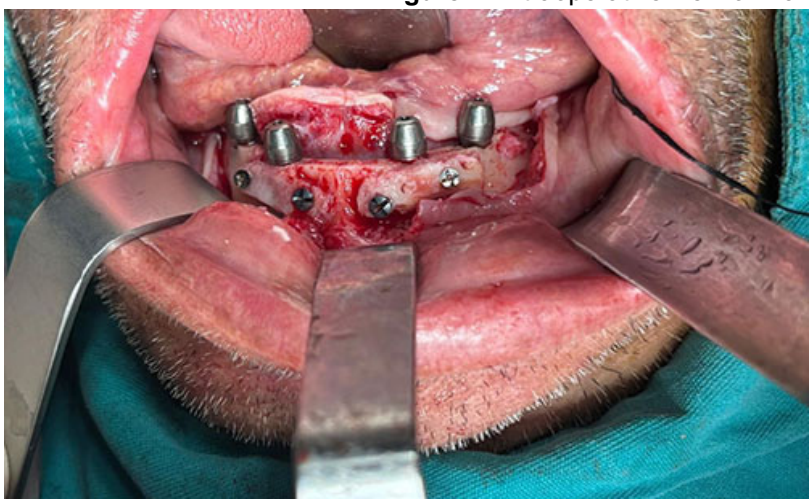

Figure 3: Intraoperative view of mandibular all-on-four implant placement

Figure 4: Postoperative scan image of the jaws

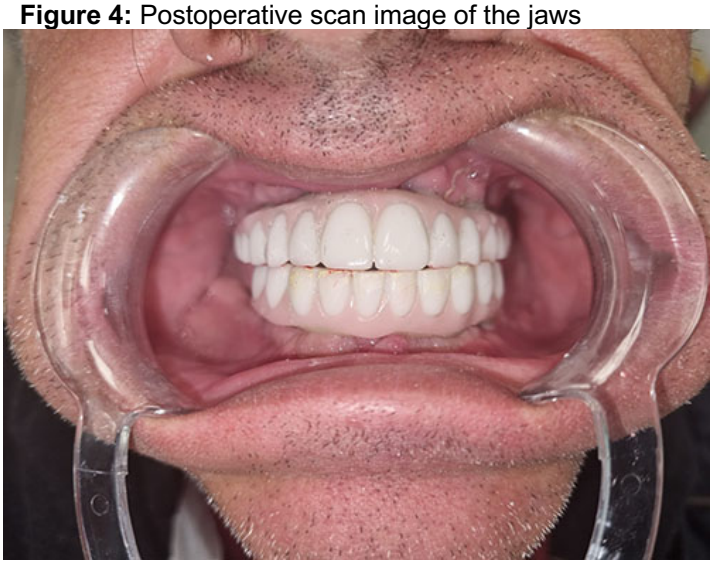

Figure 5: Temporary prosthetic loading on postoperative day 7

Figure 6: Postoperative 3-month radiological image

Figure 7: Intraoral view at postoperative 3-month follow-up

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SS-098

Extensive Multi-Space Odontogenic Infection with Ascending Spread to the Infraorbital Region: A Rare Case Report

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Abstract

Objective: Odontogenic infections are typically confined to a single fascial space but may spread along fascial planes to multiple compartments. Mandibular-origin infections can rarely extend to buccal and infraorbital regions, posing orbital risks. Posterior spread to deep spaces and the sphenoid region may lead to severe orbital complications and cavernous sinus thrombosis.
Case Report: A 40-year-old male without systemic disease presented with swelling, pain, fever, and malaise in the left hemifacial region. Examination revealed trismus and edema extending from the submandibular to the infraorbital area. Imaging showed a periapical lesion of the left mandibular second molar, abscess formation, and mandibular cortical defect. The patient was hospitalized, and the abscess was drained extraorally under general anesthesia; the causative tooth was extracted, and intraoral drainage was performed. Despite initial improvement, recurrence occurred in the buccal and infraorbital regions. Follow-up imaging revealed preseptal cellulitis and sinus involvement. Additional drainage and antibiotics led to complete recovery.
Conclusıon: Odontogenic infections may rarely spread to multiple fascial spaces and lead to severe complications. Mandibular infections can present atypical dissemination patterns. Early diagnosis, appropriate antibiotic therapy, and timely surgical drainage are essential to prevent orbital and intracranial complications.
Keywords: Drainage,Abscess,Cellulitis

1. Introduction

An odontogenic infection, which refers to an infection originating from a tooth or its surrounding periodontal tissues, ranks among the most common dental conditions encountered in routine clinical practice worldwide.These infections are primarily associated with dental caries, failed endodontic therapy, deep restorations,as well as pericoronitis, and periodontal disease. The clinical course and severity of the infection depend on the patient's immune status, the type and virulence of the microorganisms, and the treatment provided (1-2)
Odontogenic infections are typically confined to a single fascial space; however, they may spread along pathways of least tissue resistance.Their dissemination is limited by anatomical barriers such as the cortical bone, periosteum, and the fascial system of the head and neck. In addition, muscle and ligament attachments, as well as the origin of the infection (maxillary or mandibular teeth), play a crucial role in determining its localization. Although rare, infections of mandibular origin may extend from the submandibular and submasseteric spaces to the buccal and infraorbital regions. This pattern of dissemination is clinically significant and warrants careful attention due to its proximity to orbital structures. (3)
In particular, posterior progression of the infection may involve the sphenoid region and deep fascial spaces located posterior to the orbit. Such involvement may lead to severe orbital complications and increase the risk of cavernous sinus thrombosis, both of which may be life-threatening. (3)

2.Case Report

A 40-year-old male without systemic disease presented with diffuse swelling, pain, fever, and malaise in the left hemifacial region. Clinical examination revealed trismus and marked edema extending from the submandibular region to the buccal and infraorbital areas. During the two weeks prior to presentation at our clinic, the patient had received Augmentin 1 g, Biteral 500 mg, and Clin 600 mg/4 mL. Subsequently, treatment was continued with Augmentin 1 g. The patient was referred to Biruni University Faculty of Medicine Hospital for hospitalization, and an otorhinolaryngology consultation was requested.

Complete blood count obtained revealed the following values: white blood cells 19.08 ×10³/μL, neutrophils 83.5% (absolute neutrophil count 15.96 ×10³/μL), lymphocytes 10.3% (absolute lymphocyte count 1.96 ×10³/μL), monocytes 5.9% (absolute monocyte count 1.12 ×10³/μL), Platelet count was 196 ×10³/μL, and C-reactive protein level was markedly elevated at 148.8 mg/L.

Panoramic radiography demonstrated a large periapical radiolucency associated with a previously endodontically treated left mandibular second molar. Neck ultrasonography showed normal thyroid and major salivary glands; however, a lesion consistent with an abscess measuring approximately 59 × 29 mm was identified adjacent to the posterior mandible, extending toward the cheek, with peripheral enhancement and internal septations. Subcutaneous edema was present in the left cheek, and no pathological lymphadenopathy was detected. Computed tomography (CT) revealed a lingual cortical defect in the mandible.

The patient was hospitalized, and surgical intervention was performed under general anesthesia. The submandibular abscess was drained via an extraoral approach, and the causative tooth was extracted. Intraoral drainage of the submasseteric and buccal spaces was performed, and a passive drain was placed. Intraoperatively, a specimen was obtained for microbiological culture. Following general anesthesia, cefazolin (1 g) was administered intravenously at a dosage of twice daily.

Although significant improvement was observed in the submandibular and submasseteric regions, recurrence developed in the buccal and infraorbital areas prior to discharge. Follow-up CT demonstrated an anterior cortical defect in the mandibular alveolar process and fistulization between the oral cavity and the maxillary sinus. The fistulous tract extended through the buccal tissues to the infraorbital skin. Preseptal cellulitis was observed in the left periorbital region, along with secretion accumulation in the maxillary, ethmoid, and sphenoid sinuses. Periorbital edema resulted in reduced ocular opening.

Additional infraorbital drainage and daily wound care were performed. The patient remained hospitalized for seven days and received intravenous antibiotic therapy. During this period, intravenous Sulbaksit (1 g) was administered four times daily, in combination with intravenous Tigedic (5 mL) administered twice daily Rapid clinical improvement was achieved, with marked resolution within one week and complete recovery at one month. The patient was monitored weekly, and infection-related parameters gradually returned to within normal limits.

3. Discussion

This case demonstrates that odontogenic infections may spread along fascial planes following the path of least resistance, leading to the involvement of multiple fascial spaces. The literature indicates that odontogenic infections most commonly extend into the submandibular, buccal, and masseteric spaces; however, extension to the infraorbital and orbital regions has been reported to be relatively rare. Although the spread of mandibular-origin infections toward the upper fascial spaces occurs infrequently, such dissemination patterns carry a significant risk of serious complications.(2-4)

Failure to achieve a clinical response despite antibiotic therapy is a frequently encountered condition in odontogenic abscesses and is associated with inadequate drainage and increasing bacterial resistance. The literature emphasizes that antibiotic therapy alone is often insufficient, particularly in cases involving multiple fascial spaces, and that surgical drainage constitutes the cornerstone of effective management.(2)

In this case, the involvement of four distinct fascial spaces, namely the submandibular, submasseteric, buccal, and infraorbital spaces, demonstrates the aggressive potential of the infection to spread. Therefore, early recognition of atypical dissemination patterns and timely surgical intervention are of critical importance in preventing orbital and intracranial complications.

4. Conclusion

Odontogenic infections may rarely involve multiple fascial spaces, resulting in complex and potentially life-threatening clinical presentations. Particularly in patients with a history of failed endodontic treatment, inappropriate or delayed management strategies, the use of various medications at improper dosages, and incorrect or late referrals may accelerate the spread of infection and contribute to the rapid deterioration of the clinical condition. Therefore, early and accurate diagnosis, appropriate and targeted antibiotic selection, and timely surgical intervention are of paramount importance in preventing serious orbital and intracranial complications.

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6. Figures

Figure 1 : Upon presentation to the hospital

Figure 2 : Panoramic radiograph

Figure 3 : Recurrent in the infraorbital and buccal regions

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SS-102

LOW-LEVEL LASER THERAPY IN THE MANAGEMENT OF THE MEDICATION-RELATED OSTEONECROSIS OF THE JAWS: CLINICAL FOLLOW-UP—A CASE SERIES AND LITERATURE REVIEW

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Abstract

Objective: Medication-related osteonecrosis of the jaw (MRONJ) is a chronic jaw disease associated with antiresorptive, antiangiogenic, and immunomodulatory agents. Although conservative management is recommended for early-stage disease, interest in adjunctive biostimulatory therapies has increased. Low-level laser therapy (LLLT), has been proposed as a potential adjunctive treatment because of its anti-inflammatory, analgesic, and regenerative effects. This study aimed to describe the clinical outcomes of LLLT in the management of MRONJ through a case series and a review of the current literature.

Materials and Methods: Five patients with MRONJ associated with different medications and underlying diseases were included. All patients received LLLT in addition to conventional conservative treatment and were followed for up to two years. Clinical outcomes were assessed in terms of symptom resolution, mucosal healing, sequestration development, and disease progression. The findings were interpreted together with human studies published between 2009 and 2026 evaluating LLLT in patients with MRONJ or at risk of developing MRONJ.

Results: Clinical improvement was observed in all patients. Complete mucosal healing was achieved in some cases, whereas spontaneous sequestration and stable disease control were observed in others. Disease progression remained controlled in all patients at the final follow-up.

Conclusion: Adjunctive LLLT was not associated with any reported treatment-related complications and was accompanied by favorable clinical outcomes in this small case series. This case series and the current literature suggest that LLLT may improve clinical outcomes and support conservative management. However, larger controlled clinical studies are needed to establish its efficacy.

Keywords: MRONJ, PBM, LLLT

1. Introduction

Medication-related osteonecrosis of the jaws (MRONJ) is a jaw disorder associated with the use of antiresorptive, antiangiogenic, and other targeted agents, characterized by exposed bone or bone that can be probed through an intraoral or extraoral fistula persisting for more than 8 weeks. The diagnosis requires current or previous exposure to these medications and no history of radiation therapy to the jaws or metastatic disease involving the jaws (1).

The staging system updated by the American Association of Oral and Maxillofacial Surgeons (AAOMS) in 2022 provides a clinical classification ranging from patients at risk to advanced osteolytic lesions and serves as a guide for treatment planning. In advanced stages of the disease, pain, infection, mucosal or extraoral fistula formation, extensive bone necrosis, pathological fractures, and areas of osteolysis extending to adjacent anatomical structures may be observed (1).

The primary goals of MRONJ treatment are to control pain, reduce infection, prevent the progression of necrotic bone, and improve patients' quality of life. Although current guidelines recommend conservative and surgical

treatment approaches according to the stage of the disease, interest in biostimulation-based adjunctive therapies has been increasing (1).

Low-level laser therapy (LLLT), also referred to as photobiomodulation (PBM), is a non-invasive treatment modality that utilizes the anti-inflammatory, analgesic, and biostimulatory effects of laser irradiation. Owing to these properties, LLLT is considered a potential adjunctive treatment option in the management of MRONJ (3,4,5).

The aim of this study was to present the clinical outcomes of five MRONJ cases managed with LLLT and to evaluate these findings in the context of the current literature.

2. Materials and Methods

This study consists of an observational case series and a literature review evaluating the clinical outcomes of low-level laser therapy (LLLT) in patients at risk of developing medication-related osteonecrosis of the jaw (MRONJ) who subsequently developed MRONJ following tooth extraction. The diagnosis and staging of MRONJ were performed according to the 2022 criteria of the American Association of Oral and Maxillofacial Surgeons (AAOMS) (1).

Tooth extractions were performed in all patients according to a standardized surgical protocol. Atraumatic extraction principles were followed with perioperative antibiotic prophylaxis. Autologous platelet-rich fibrin (PRF) was placed into the extraction sockets, followed by primary soft tissue closure. All patients received oral hygiene instructions and were enrolled in regular postoperative clinical follow-up.

Five patients who developed MRONJ during the follow-up period according to the AAOMS 2022 criteria were included in the study. As part of conservative management, all patients received oral hygiene measures, antiseptic mouth rinses, and systemic antibiotics when indicated, in addition to low-level laser therapy (LLLT).

Low-level laser therapy (LLLT) was performed using the GGR Laser (Low Level Laser Therapy) device available in our clinic at wavelengths of 650 nm and 904 nm. The treatment protocol consisted of daily applications during the first 10 sessions, followed by applications on alternate days, with a minimum of 30 treatment sessions administered to each patient. The same treatment protocol was applied to all patients.

In addition to the case series, a literature search was conducted in the PubMed database to support the discussion section of the study. The search was performed using the keywords **"medication-related osteonecrosis of the jaw (MRONJ)," "bisphosphonate-related osteonecrosis of the jaw (BRONJ)," "photobiomodulation (PBM),"** and **"low-level laser therapy (LLLT),"** as well as their combinations. Clinical studies evaluating the use of low-level laser therapy in the management of MRONJ were reviewed, and the most relevant studies were selected for inclusion in the discussion. The findings of these studies were comparatively evaluated with the results of the present case series.

During the follow-up period, patients were clinically evaluated for pain, bone exposure, mucosal healing, spontaneous sequestration, and disease progression. The primary outcome measures were mucosal healing, control of disease progression, reduction in pain, changes in bone exposure, and the development of spontaneous sequestration.

3. Results

Five patients diagnosed with MRONJ according to the AAOMS 2022 criteria were included in the study. Four patients were female and one was male, with ages ranging from 22 to 76 years. MRONJ was associated with antiresorptive therapy (zoledronic acid or denosumab) in four patients and with immunomodulatory therapy in one patient. In all cases, MRONJ developed following tooth extraction. The demographic and clinical characteristics of the five patients are summarized in **Table 1**.

Case 1: A 22-year-old male patient with metastatic osteosarcoma who had previously received antineoplastic therapy and was receiving immunomodulatory treatment underwent extraction of tooth #38 following temporary discontinuation of the immunomodulatory agent in consultation with the treating physician. Initial healing of the extraction socket was uneventful. The patient subsequently returned with complications caused by restorative material that had entered the extraction socket. Radiographic examination revealed a foreign body, which was removed through the existing opening. Following the subsequent development of Stage 1 medication-related osteonecrosis of the jaw (MRONJ), conservative management and adjuvant low-level laser therapy (LLLT) were initiated (Figure 1A). During follow-up, the patient underwent a surgical intervention at an outside institution. After surgery, the patient presented to our clinic with infection, swelling, and numbness, and was diagnosed with Stage 2 MRONJ (Figure 1B). Following the reintroduction of conservative management and LLLT, the signs of infection were controlled, with marked improvement in pain, numbness, and other clinical symptoms. During follow-up, spontaneous bone sequestration occurred, and complete mucosal healing was achieved after separation of the sequestrum. The postoperative sensory deficit associated with the inferior alveolar nerve had completely resolved by the one-month follow-up visit (Figure 1C).

Case 2: A 61-year-old female patient with a history of antineoplastic therapy for breast cancer and receiving zoledronic acid developed Stage 1 MRONJ following extraction of tooth #14 (Figure 2A). Recurrent episodes of infection and clinical exacerbations were observed during follow-up. Following LLLT in addition to conservative treatment, spontaneous bone sequestration occurred, and complete mucosal healing was achieved (Figure 2B).

Case 3: A 66-year-old female patient with a history of antineoplastic therapy for lung cancer and receiving zoledronic acid developed Stage 1 MRONJ following extraction of tooth #36 (Figure 3A). During follow-up, conservative treatment and LLLT were administered. Complete mucosal healing was achieved following spontaneous bone sequestration (Figure 3B).

Case 4: A 29-year-old female patient receiving denosumab for a giant cell tumor of bone presented to our clinic with Stage 2 MRONJ that developed following extraction of tooth #38 (Figure 4A). During episodes of infection accompanied by pain and purulent discharge, systemic antibiotics and adjunctive LLLT were administered in addition to conservative treatment. Spontaneous bone sequestration was observed during follow-up, clinical symptoms were controlled, and complete mucosal healing was achieved (Figure 4B).

Case 5: A 76-year-old female patient with a history of antineoplastic therapy for metastatic breast cancer and receiving denosumab underwent extraction of tooth #35 following temporary discontinuation of denosumab therapy after consultation with the treating physician. Because of the patient's systemic condition, a conservative approach with adjunctive LLLT was preferred after the development of MRONJ following tooth extraction (Figure 5A). During follow-up, recurrent episodes of infection and clinical findings consistent with Stage 2 MRONJ were observed. Following systemic antibiotic therapy and LLLT, the symptoms were brought under control. Although denosumab therapy was resumed during the first year because of systemic necessity, the patient has remained clinically stable and is currently being followed with Stage 1 MRONJ (Figure 5B-C).

The treatments administered and follow-up outcomes for all cases are summarized in Table 2. Overall, complete mucosal healing was achieved in four of the five patients, while the remaining patient exhibited stable disease and was followed at Stage 1. Spontaneous bone sequestration was observed in four patients. During follow-up, some patients experienced intermittent episodes of infection and temporary disease progression. During these episodes, conservative management consisted of systemic antibiotic therapy, irrigation of the lesion site with sterile saline, and continuation of low-level laser therapy (LLLT). Patients were monitored regularly by clinical examination, panoramic radiography, and cone-beam computed tomography (CBCT), when indicated. In one patient with advanced-stage disease, the mandibular nerve–related sensory deficit present at baseline had completely resolved by the one-month follow-up visit. No uncontrolled disease progression was observed during the follow-up period, and all patients achieved either clinical improvement or stable disease.

4. Discussion

Medication-related osteonecrosis of the jaw (MRONJ) is a clinically significant condition associated with the use of antiresorptive, antiangiogenic, and, more recently, immunomodulatory agents. It remains difficult to treat and has a substantial negative impact on patients' quality of life. The current AAOMS position paper recommends that both conservative and surgical treatment options should be considered according to the stage of the disease. In recent years, photobiomodulation (PBM) and low-level laser therapy (LLLT) have attracted increasing interest as complementary approaches that support wound healing (1,3,4).

The therapeutic effects of LLLT have been attributed to several biological mechanisms, including enhanced cellular ATP production, improved microcirculation, modulation of the inflammatory response, stimulation of fibroblast proliferation, collagen synthesis, and angiogenesis (6). Through these mechanisms, LLLT is intended to reduce pain, control infection, and accelerate soft tissue healing. However, because considerable variations exist in laser type, wavelength, energy density, application frequency, and the total number of treatment sessions, no standardized PBM protocol has yet been established (7).

Studies evaluating the prophylactic use of PBM have reported promising results. In a series of 589 tooth extractions performed in patients receiving bisphosphonates, Vescovi et al. reported that the use of a standard extraction protocol combined with Nd:YAG laser resulted in minimal bone exposure in only 0.85% of cases, all of which were successfully managed with conservative treatment (8). In another study by the same research group involving patients with a previous history of MRONJ, the extraction protocol was also associated with a very low complication rate, and complete mucosal healing was achieved within a short period in the majority of patients (9). Similarly, Tenore et al. reported complete healing without the development of MRONJ in more than 80% of at-risk patients who underwent PBM-assisted tooth extraction and identified zoledronic acid and corticosteroid use as significant risk factors (10). Although prophylactic laser therapy was not applied in the present study, the favorable clinical outcomes achieved with LLLT initiated after the development of MRONJ despite a standard extraction protocol suggest that PBM may be beneficial not only as a preventive strategy but also as a therapeutic approach.

Studies evaluating PBM as a therapeutic modality have likewise reported favorable outcomes. In their prospective study, Scoletta et al. demonstrated significant reductions in pain, edema, suppuration, and fistula formation following LLLT, with clinical stage improvement observed in 60% of patients and no treatment-related complications reported (3). In a large series including 241 patients, Nica et al. showed that pain and inflammation were effectively controlled, particularly in early-stage disease, whereas downstaging of advanced disease, even in the absence of complete healing, contributed substantially to patients' quality of life (11). Similarly, Michalak et al. reported higher rates of mucosal healing with PBM in Stage I MRONJ, whereas patients with advanced disease required longer treatment durations and additional interventions (7). These findings suggest that PBM has a high potential for promoting healing in early-stage disease and may also contribute to clinical improvement and disease control in selected advanced-stage cases.

Studies investigating PBM as an adjunct to conservative and surgical treatment have also produced noteworthy findings. In their long-term follow-up study combining antimicrobial photodynamic therapy with PBM, Tartaroti et al. reported high rates of mucosal healing and symptom control in the treatment group, whereas spontaneous bone sequestration occurred in only a limited number of patients (4). Comparative studies by Manfredi et al. and Vescovi et al. demonstrated that adding LLLT to medical treatment resulted in better clinical outcomes than medical treatment alone, while the highest success rates were achieved with the combination of surgery and PBM (12,13,14). Nevertheless, Vescovi et al. also reported clinical improvement in patients treated with LLLT alone and suggested that this approach may be particularly beneficial for patients in whom surgery is contraindicated because of their systemic condition (14). Furthermore, studies combining leukocyte- and platelet-rich fibrin (L-PRF) with PBM have reported that this combination is associated with high healing rates (15).

In the present case series, complete mucosal healing was achieved in four patients following the addition of LLLT to conservative treatment, and spontaneous bone sequestration was observed in four patients. Furthermore, in one patient who presented with persistent symptoms despite having undergone surgery at another center, infection was controlled, mandibular nerve-related sensory deficit resolved completely, and the disease was stabilized. The obtained results align closely with previous reports in the literature. Crucially, they indicate that

LLLT not only aids in pain management but also actively modulates inflammation, facilitates spontaneous sequestration, and accelerates mucosal healing. However, because this study did not include a control group, the observed outcomes cannot be attributed solely to LLLT. Conservative treatment, systemic antibiotic therapy, PRF application, and the patients' systemic conditions may also have contributed to the clinical outcomes.

The main feature distinguishing this case series from previously published reports is the use of the same LLLT protocol in all patients and the evaluation of outcomes through long-term clinical follow-up. In addition, the occurrence of spontaneous bone sequestration and complete mucosal healing in conservatively managed patients represents one of the most notable findings of the present study.

The main limitations of this study include its retrospective design, limited sample size, heterogeneity in patients' systemic diseases and medication regimens, and the absence of a control group. Nevertheless, the use of a standardized LLLT protocol in all patients and the availability of long-term clinical follow-up data represent important strengths of the study. Future multicenter, prospective, and controlled clinical studies using standardized laser parameters will help clarify the true efficacy of LLLT in the treatment of MRONJ and identify the patient populations most likely to benefit from this approach.

5. Conclusion

Low-level laser therapy (LLLT) has been reported to promote clinical healing in medication-related osteonecrosis of the jaw (MRONJ) by modulating inflammation, enhancing microcirculation, and stimulating tissue regeneration. Consistent with these findings, our case series suggests that LLLT may have contributed to pain and infection control, may have promoted spontaneous bone sequestration, and may have enhanced mucosal healing in patients with MRONJ. Complete mucosal healing was achieved in most cases, while all patients exhibited clinical improvement, disease control, and a stable clinical course. These favorable outcomes, achieved without surgical intervention, suggest that LLLT may represent a valuable adjunct to conservative management in selected patients with MRONJ.

Taken together, the findings from the current literature and our clinical experience indicate that, with appropriate patient selection and careful clinical follow-up, LLLT may be considered a promising therapeutic approach that supports clinical healing and has the potential to reduce the need for surgical intervention in selected MRONJ cases. Nevertheless, larger prospective controlled clinical studies are required to validate these findings, establish clear indications, and develop standardized treatment protocols.

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7. FİGURES

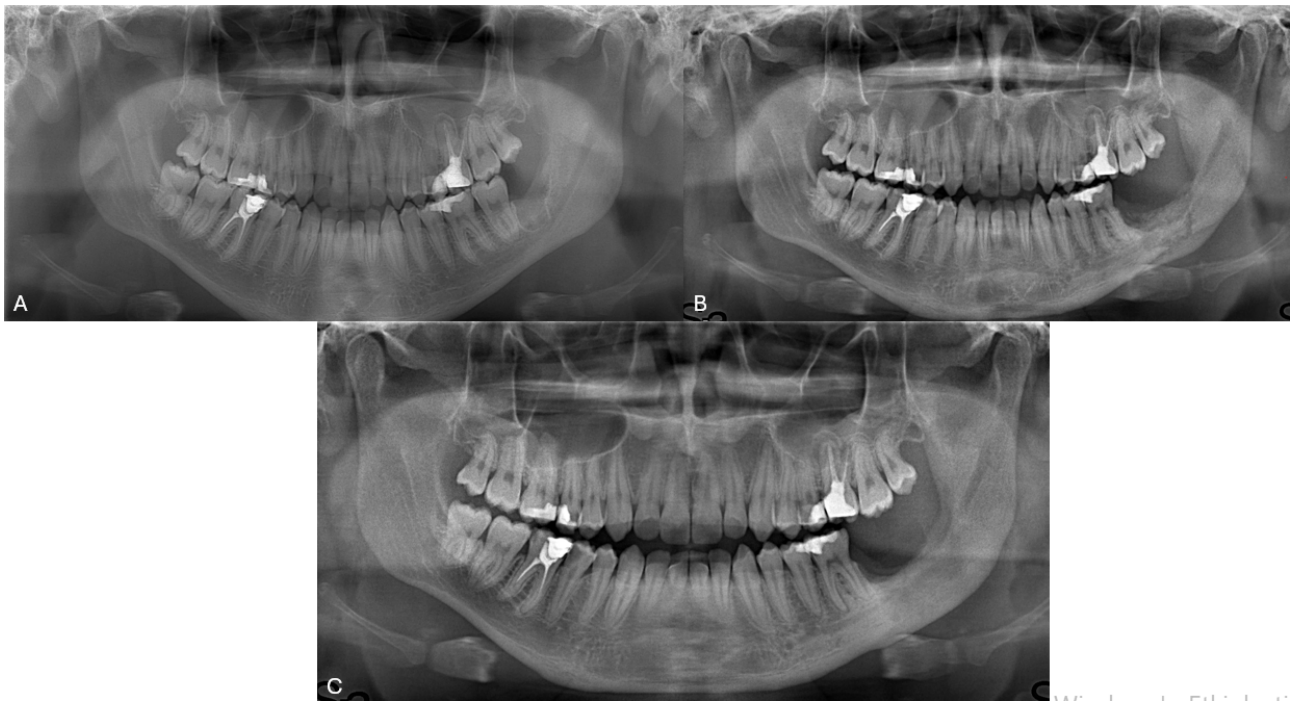

Figure 1: Panoramic radiographs of Case 1. **(A)** Initial panoramic radiograph showing Stage 1 medication-related osteonecrosis of the jaw (MRONJ). **(B)** Panoramic radiograph obtained after surgical intervention at an outside institution, demonstrating Stage 2 MRONJ at the patient's presentation to our clinic. **(C)** Follow-up panoramic radiograph demonstrating complete healing following conservative management and low-level laser therapy (LLLT).

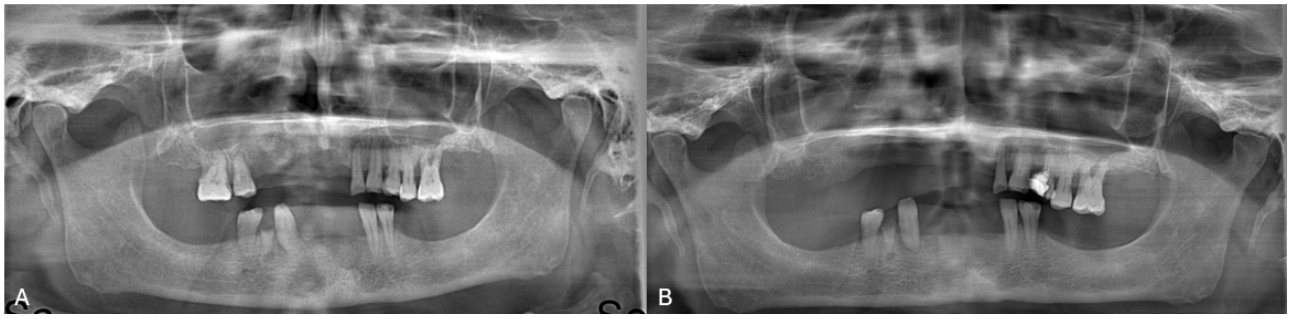

Figure 2: Panoramic radiographs of Case 2. **(A)** Initial MRONJ lesion. **(B)** Follow-up radiograph after conservative management and adjuvant LLLT, demonstrating complete healing.

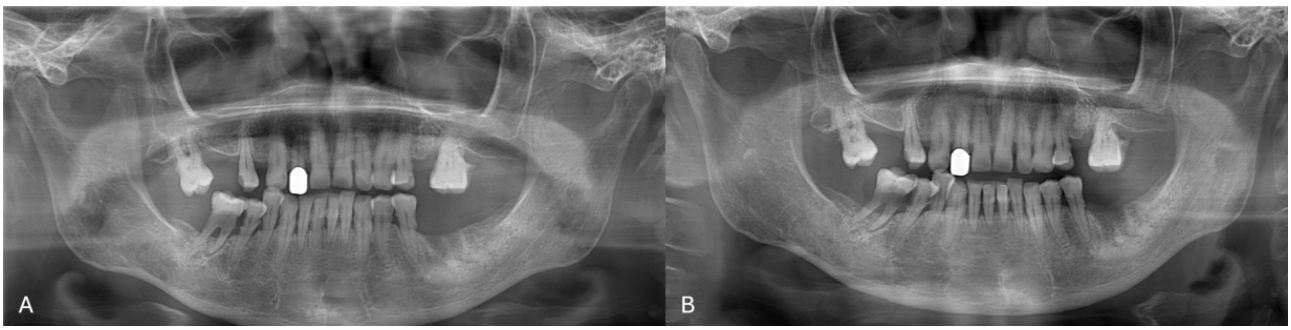

Figure 3: Panoramic radiographs of Case 3. **(A)** Initial MRONJ lesion. **(B)** Follow-up radiograph after conservative management and adjuvant LLLT, demonstrating complete healing.

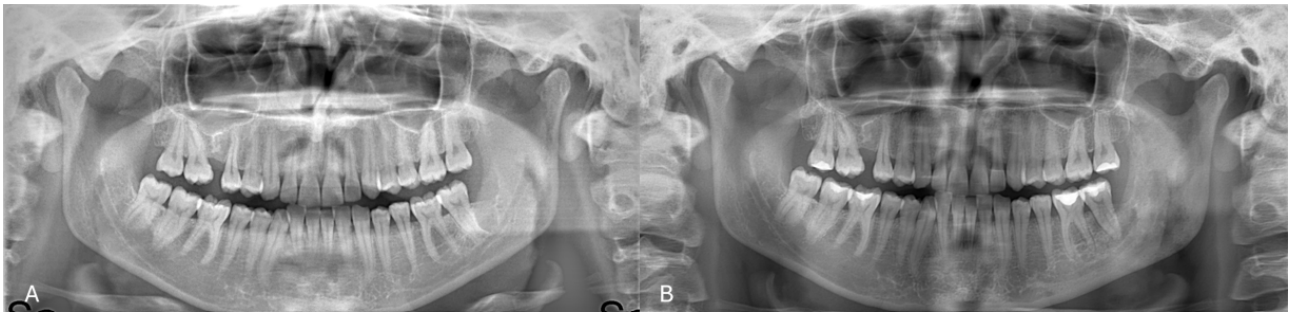

Figure 4: Panoramic radiographs of Case 4. **(A)** Initial MRONJ lesion. **(B)** Follow-up radiograph demonstrating complete healing after conservative management and adjuvant LLLT.

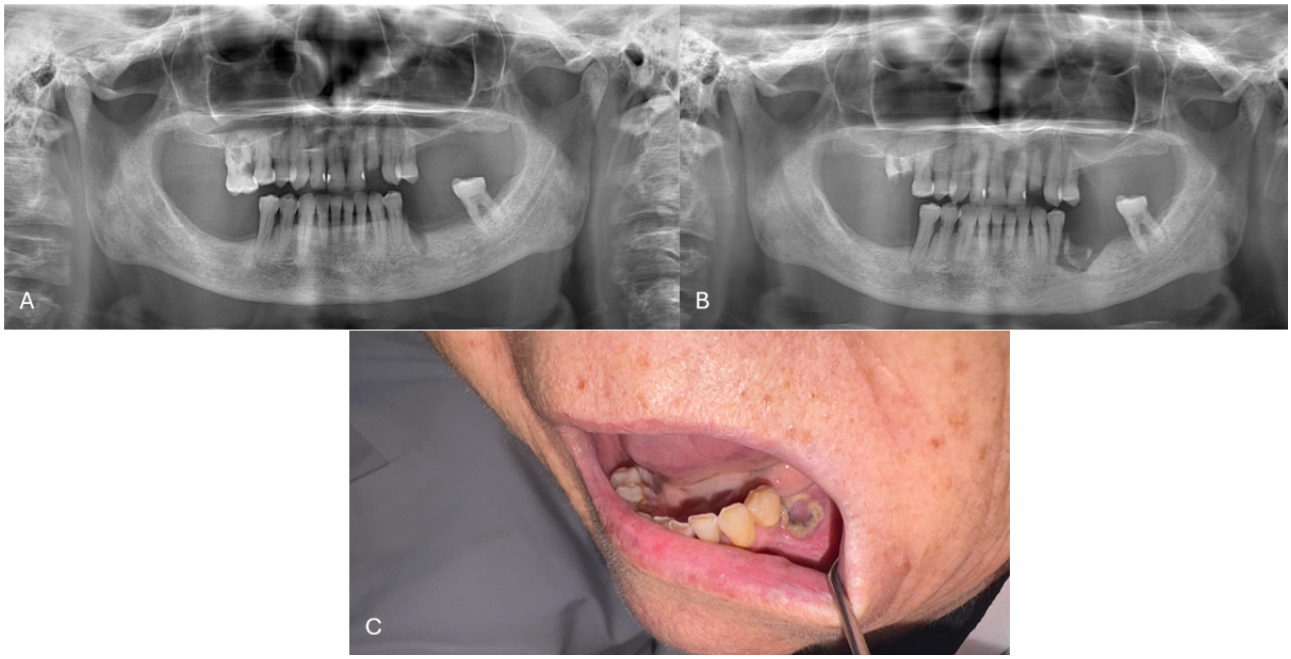

Figure 5: Clinical and panoramic images of Case 5. **(A)** Initial panoramic radiograph showing the MRONJ lesion. **(B)** Follow-up panoramic radiograph obtained during clinical follow-up after conservative management and adjuvant LLLT. **(C)** Clinical photograph obtained during follow-up, demonstrating healthy mucosal coverage.

8. TABLES

Table 1. Demographic and Clinical Characteristics of Patients with MRONJ Included in the Study

Case	Age/Sex	Systemic Disease	Associated Medication	Extracted Tooth	Location
1	22/M	Metastatic osteosarcoma	Immunomodulatory agent	#38	Mandible
2	61/F	Metastatic breast cancer	Zoledronic acid	#14	Maxilla
3	66/F	Lung cancer	Zoledronic acid	#36	Mandible
4	29/F	Giant cell tumor of bone	Denosumab	#38	Mandible

Case	Age/Sex	Systemic Disease	Associated Medication	Extracted Tooth	Location
5	76/F	Metastatic breast cancer	Denosumab	#35	Mandible

Table 2. Follow-up Outcomes of Patients with MRONJ Treated with Conservative Management and Low-Level Laser Therapy

Case	Conservative Management*	Spontaneous Sequestration	Follow-up	Final Outcome
1	Conservative treatment + LLLT	Yes	23 months	Complete mucosal healing; mandibular nerve-related sensory deficit resolved
2	Conservative treatment + LLLT	Yes	10 months	Complete mucosal healing
3	Conservative treatment + LLLT	Yes	7 months	Complete mucosal healing
4	Conservative treatment + LLLT	Yes	18 months	Complete mucosal healing
5	Conservative treatment + LLLT	No	26 months	Stable disease (Stage 2 → Stage 1)

Abbreviations: LLLT, low-level laser therapy.
*Conservative management included oral hygiene measures, antiseptic mouth rinses, systemic antibiotic therapy when indicated, and low-level laser therapy (LLLT).

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SS-103

Multidisciplinary Management of Bilateral Intraoral Lesions in a Patient with Von Recklinghausen Disease: A Case Report and Literature Review

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Abstract

Introduction: Von Recklinghausen disease (Neurofibromatosis Type 1, NF1) is an autosomal dominant disorder originating from neural crest cells, characterized by multisystemic involvement. Within the oral cavity, it most commonly manifests as soft tissue proliferations localized to the tongue and alveolar ridges. This report describes the surgical management and histopathological findings of intraoral lesions in an NF1 patient with significant systemic comorbidities, with reference to the current literature.

Case Presentation: A 48-year-old female patient was referred to the Department of Oral and Maxillofacial Surgery at Istanbul Aydin University presenting with painful exophytic masses of the alveolar ridges. The patient was classified as ASA-II based on mild systemic disease without significant functional limitation, active smoking history, absence of alcohol consumption, and age-appropriate body mass index. Medical history revealed a concurrent NF1 diagnosis alongside daily use of 20 mg rivaroxaban (Xarelto) for mesenteric artery occlusion. Extraoral examination demonstrated diffuse cutaneous neurofibromas and café-au-lait macules across the facial region and various body surfaces. Intraoral examination revealed bilateral posterior mandibular sessile, firm, smooth-surfaced fibrotic gingival enlargements ranging from 3 to 8 mm in diameter. Preoperative cardiovascular surgery consultation was obtained and anticoagulant therapy was bridged with low molecular weight heparin. Lesions were excised under local anesthesia using a scalpel, following which preprosthetic surgical procedures were completed and hemostasis was achieved with electrocautery where indicated. Excised specimens were submitted for histopathological examination in 10% neutral buffered formalin. Histopathological examination confirmed a neurofibroma, with immunohistochemistry demonstrating diffuse, strong S-100 positivity and a focal net-like CD34 pattern in the tumor cells, alongside toluidine blue–positive mast cell.

Conclusion: Oral lesions in NF1 may give rise to considerable clinical challenges, most notably pain, aesthetic impairment, and functional limitations. In patients with chronic medication use and systemic involvement, a multidisciplinary treatment protocol is of paramount importance in preventing postoperative complications. This case carries significant clinical value given the rarity of such oral manifestations of the disease.

Key Words: Genetic diseases, neurofibromatosis type 1, von Recklinghausen's disease

1. Introduction

The term neurofibromatosis (NF) designates a group of genetic disorders that principally compromise the cellular growth of neural tissues (1). Two distinct forms of the condition are recognised: Type 1 (NF1) and Type 2 (NF2) (1,2). These forms exhibit relatively few shared features and originate from mutations in separate genes (2).

Café-au-lait spots, axillary and inguinal freckling, optic gliomas, Lisch nodules (pigmented hamartomas of the iris), spinal and peripheral nerve neurofibromas, neurological or cognitive impairment, scoliosis, oral and maxillofacial abnormalities, malignant tumors of the nerve sheath, pheochromocytoma, vasculopathy, and specific bone lesions represent the common clinical features of NF1 (2,3). Malignant transformation has been reported in 5-15% of cases, particularly in patients older than 40 years (4). Moreover, oral manifestations are present in almost 72% of patients with NF1 (2,3). Café-au-lait spots are also encountered in certain other diseases.

We report on a patient with NF1 presenting with multiple manifestations of the disorder in the oral region. Furthermore, we provide a review of the literature focusing on clinical manifestations and diagnostic strategies.

2. Case Presentation:

A 48-year-old woman was referred to the Department of Oral and Maxillofacial Surgery at Istanbul Aydın University with painful exophytic masses of the alveolar ridges.

The patient had several soft tissue cutaneous nodules on the body (neurofibroma), including the head and neck, and multiple hyperpigmented macules (Café-au-lait pigmentation). The patient had been aware of the gingival swelling for three years but had elected not to seek treatment, given that the lesion had remained asymptomatic. The systemic evaluation revealed mild systemic disease without notable functional limitation, an active smoking history, no alcohol use, and an age-appropriate body mass index. Her medical history disclosed a coexisting diagnosis of NF1 together with daily administration of 20 mg rivaroxaban (Xarelto) for mesenteric artery occlusion. Extraoral examination revealed diffuse cutaneous neurofibromas and café-au-lait macules over the facial region (Figure 1) and several other body surfaces. Intraoral examination identified bilateral sessile, firm, smooth-surfaced fibrotic gingival enlargements in the posterior mandible, measuring between 3 and 8 mm in diameter (Figure 2a). The character of swellings was diffuse, tender on palpation, and did not bleed on touch. Further, they were non-compressible and non-fluctuant in nature. A preoperative cardiovascular surgery consultation was carried out, and anticoagulant therapy was bridged with low molecular weight heparin. The lesions were excised under local anaesthesia with a scalpel, after which preprosthetic surgical procedures were completed and haemostasis was secured using electrocautery where required (Figure 2, b and c). The specimen was a yellowish-white, substantial, inelastic mass. The excised specimens were placed in 10% neutral buffered formalin and submitted for histopathological examination, which confirmed the diagnosis of neurofibroma.

In the sections examined, the tissue specimens were covered by stratified squamous epithelium. The sections demonstrated a moderately cellular tumor composed of spindle-shaped cells. Most of these cells had scant cytoplasm with slender, wavy nuclei, while a proportion exhibited more abundant cytoplasm. The nuclei were oval in shape. The stroma was rich in collagen fibres, which formed short, interlacing bundles and focal storiform (whorling) structures. Scattered mast cells with metachromatic cytoplasmic granules are identified on Toluidine blue staining. Immunohistochemically, the tumor cells show diffuse and strong cytoplasmic positivity for S-100 protein, and focal, reticular, strong cytoplasmic and membranous positivity for CD34. Appropriate positive controls were used for both markers. No mitotic activity or necrosis is identified (Figure 3a-d).

3. Discussion

Neurofibromatosis type 1, also referred to as von Recklinghausen's disease, constitutes a neurodermal dysplasia. The pathological changes that characterize the disorder arise during the embryonic period, preceding the differentiation of the neural crest (2).

NF1 is the most common form of the disease, accounting for an estimated 90% of all cases. It ranks among the most frequently encountered human genetic disorders, with a prevalence of approximately one in 3,000 births (1,2). The disorder demonstrates no predilection for either sex or any racial group. NF1 is an autosomal dominant condition resulting from a broad spectrum of mutations affecting the NF1 gene, which is located on chromosome 17q11.2. It carries one of the highest rates of spontaneous mutation observed among human genetic diseases. A positive family history is identified in only 50% of patients with NF1, whereas the remaining cases arise from spontaneous mutations. The expressivity of the disorder is highly variable, with clinical manifestations ranging from mild lesions to numerous complications and functional impairment (2).

Neurofibromas of the oral cavity generally arise as a component of a syndrome, namely NF-1 or NF-2. Only 6.5% of solitary lesions are found to affect the oral cavity in the absence of any features of neurofibromatosis type 1 (NF-1). Solitary neurofibromas are uncommon in the oral cavity, with a reported prevalence of 4%–7% (5).

Neurofibromas do not usually cause jaw bone destruction, and when osseous involvement is present, it is generally encountered only at an advanced stage (6). In the present case, no bone infiltration was observed, a finding that aligns with the typical behavior of the lesion. It should nonetheless be emphasized that, as reported in the literature, bone resorption remains a possibility, and the absence of osseous involvement in our patient does not preclude such progression in comparable cases. Appropriate radiographic assessment is therefore advisable to monitor these lesions and to detect any developing bone destruction at an early stage (6-8).

Owing to the rarity of the condition, the oral complications of NF1 remain under-reported in the literature. The manifestations described include an asymmetrically enlarged face with multiple cutaneous, disseminated, and plexiform neurofibromas, together with craniofacial bony changes such as sphenoid and orbital dysplasia and various mandibular deformities affecting the ramus, glenoid fossa, and condylar head. Other reported intraoral features comprise pigmentation of the oral mucosa and tongue, an enlarged tongue with prominent fungiform papillae, malposed teeth accompanied by an increased incidence of dental caries, and class III malocclusion (9-11). A retrospective study of 327 individuals found oral mucosal alterations and exostoses to be significantly more

common in NF1 patients than in controls, with oral neurofibromas being more frequent in older patients and those with multiple cutaneous neurofibromas (12). In the present case, the manifestations were confined to cutaneous neurofibromas, café-au-lait macules, and multiple gingival neurofibromatous enlargements, without the extensive craniofacial or skeletal involvement frequently documented in the literature.

The diagnosis of neurofibroma rests on the integration of clinical, histopathological, and immunohistochemical findings. Histologically, the lesion is composed of spindle-shaped cells with slender, wavy nuclei set within a collagen-rich stroma. On immunohistochemical analysis, a classic neurofibroma characteristically demonstrates diffuse S-100 positivity, reflecting its Schwann cell component, while CD34 highlights a subpopulation of fibroblast-like cells (13- 15). In line with this, the tumor cells in the present case exhibited diffuse strong S-100 expression together with focal net-like CD34 positivity, accompanied by toluidine blue–positive mast cells within the stroma.

4. Conclusion

Although neurofibromatosis is an uncommon condition, the most recent reports (15,16) have documented cases presenting with intraoral findings comparable to those observed in the present case. Oral lesions in NF1 can pose substantial clinical difficulties, particularly pain, compromised aesthetics, and functional restrictions. For patients receiving long-term medication and presenting with systemic involvement, a multidisciplinary treatment approach is essential to avert postoperative complications. The present case holds considerable clinical importance, owing to the rarity of such oral manifestations and the diagnostic value of immunohistochemical examination.

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Figure 1: Macules over the facial region.

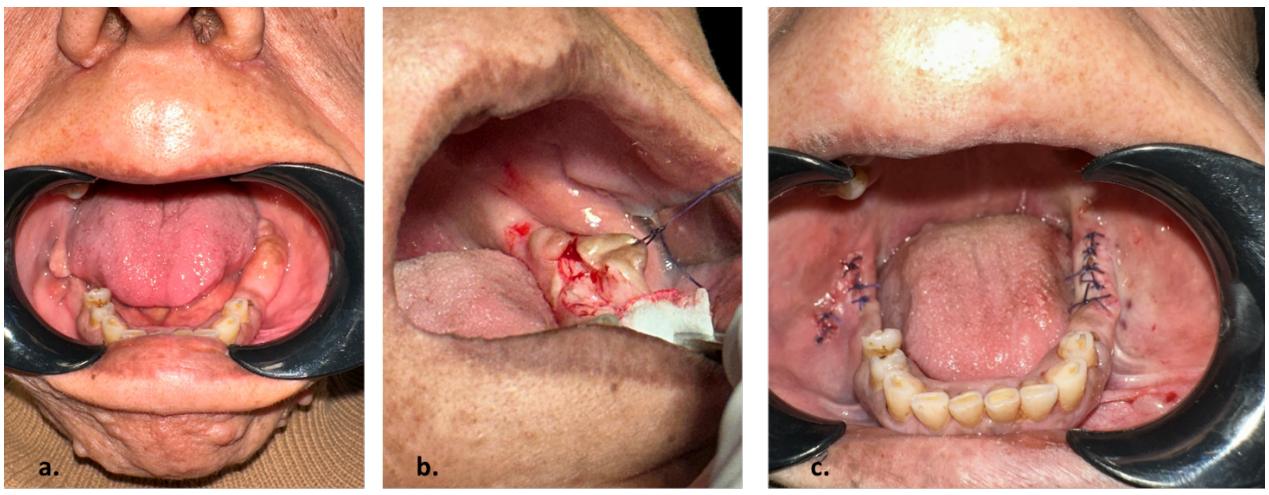

Figure 2: a. Intraoral examination, b)Intraoperative image, c) Postoperative image.

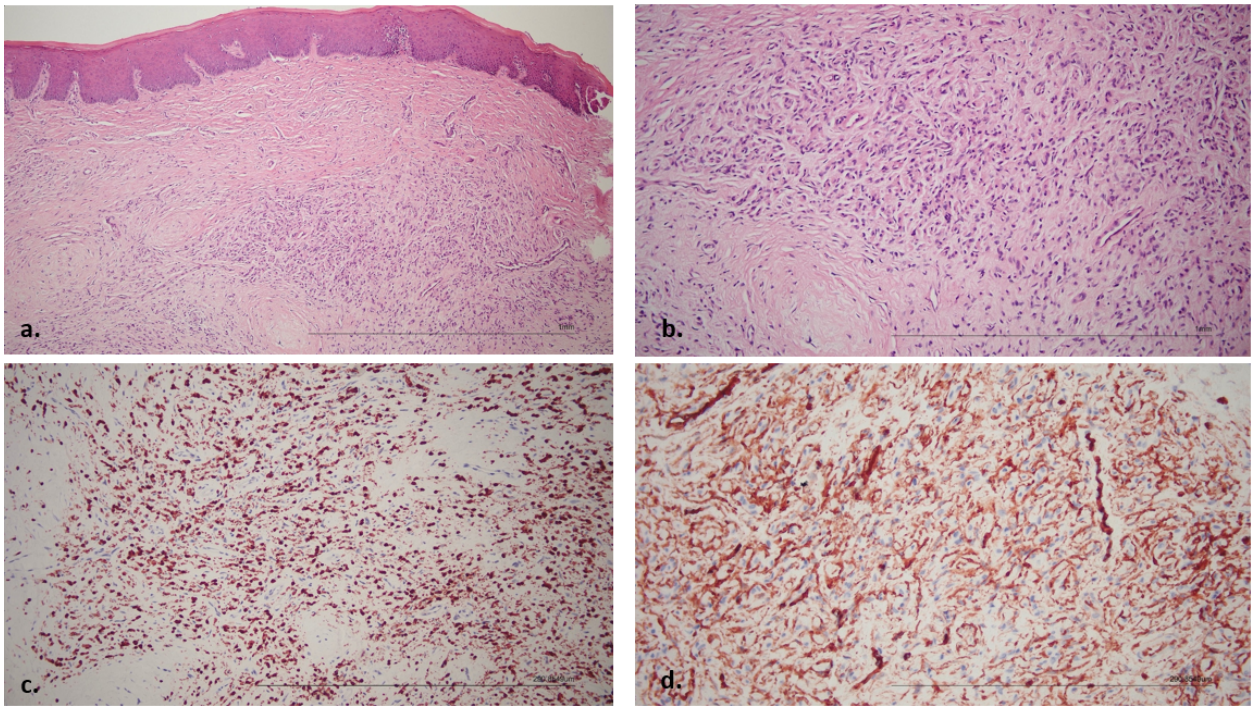

Figure 3: a) The lesion is covered by stratified squamous epithelium (asterisk). A spindle cell tumor proliferation is seen within a collagen-rich stroma in the subepithelial compartment (Hematoxylin & Eosin, original magnification ×100), b) At higher magnification, the tumor cells display wavy nuclei with narrow cytoplasm, characteristic of neural differentiation. A subset of cells shows broader cytoplasm and oval nuclei. Collagen fibers form short intersecting fascicles and focal whorling arrangements (Hematoxylin & Eosin, original magnification ×200), c) Immunohistochemical staining for S-100 protein shows diffuse and strong cytoplasmic positivity in the tumor cells, confirming Schwann cell differentiation (S- 100, original magnification ×400), d) CD34 immunostaining demonstrates focal, reticular strong cytoplasmic and membranous positivity in the tumor cells, a pattern characteristic of neurofibroma (CD34, original magnification ×400).

SS-105

Treatment of Horizontal Ridge Deficiency with the Ridge Split Technique: Two Case Reports

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Abstract

Objective: Adequate alveolar ridge width in dental implant rehabilitation is critical for primary stability and long-term success. Horizontal bone resorption developing after tooth loss can complicate implant placement and necessitates various augmentation methods. The objective of this case report is to evaluate the clinical outcomes of the ridge split technique and simultaneous implant placement in the treatment of horizontal ridge deficiency through two cases.

Case: A 62-year-old female patient presenting with a request for fixed prosthetic rehabilitation and a totally edentulous 67-year-old male patient were evaluated. In both cases, a horizontal ridge deficiency of approximately 3 mm in width was detected in cone-beam computed tomography examinations. Osteotomies were performed using W&H Piezomed SA-320 ultrasonic bone surgery unit (W&H Dentalwerk Bürmoos GmbH, Bürmoos, Austria) and simultaneous implants were placed following controlled ridge expansion. A total of 10 implants were applied in the first case, and 4 implants were applied in the second case within the scope of the All-on-4 concept. Defect areas were supported with particulate xenograft, and primary closure was achieved. In the second case, a buccal cortical bone fracture occurred during implant placement; the fragment was stabilized, and the surgery was completed. Uncomplicated healing and successful osseointegration were observed in both patients during the four-month follow-up period.

Conclusion: The ridge split technique is a predictable and effective treatment option that allows for simultaneous implant placement in horizontal ridge deficiencies where there is adequate vertical bone height.

Keywords: Horizontal bone deficiency, ridge split, implant, piezosurgery, bone augmentation

1. Introduction

Resorptive remodeling of the alveolar ridge following tooth extraction is an inevitable biological process that leads to progressive reductions in alveolar bone volume, with horizontal bone loss generally being more pronounced than vertical resorption. This dimensional change may compromise ideal implant positioning and often necessitates horizontal ridge augmentation before implant placement (1).

Several surgical techniques have been proposed for the rehabilitation of narrow alveolar ridges, including guided bone regeneration, autogenous block bone grafting, distraction osteogenesis, and the ridge split technique (2,3). Among these approaches, the ridge split technique has gained increasing popularity because it enables controlled expansion of the existing alveolar bone while allowing simultaneous implant placement in appropriately selected cases. Consequently, treatment time and patient morbidity may be reduced compared with staged augmentation procedures (4).

Recent systematic reviews have reported that the ridge split technique provides an average horizontal bone gain of 3.06–3.35 mm, with implant survival rates ranging from 97% to 98%, supporting its predictability for the treatment of horizontal ridge deficiencies (5,6). Furthermore, the use of piezoelectric surgical devices facilitates precise osteotomies with minimal trauma to adjacent soft tissues, contributing to safer and more controlled ridge expansion. Nevertheless, complications such as buccal cortical plate fracture, dehiscence, and wound exposure may still occur (2).

The present report describes the clinical management of two patients with horizontal alveolar ridge deficiency treated using the ridge split technique with simultaneous implant placement and presents their clinical and radiographic outcomes.

2. Case Report

2.1. Case 1

A sixty-two-year-old female patient presented to our clinic with a request for fixed implant-supported prosthetic rehabilitation due to multiple missing teeth in the maxilla and mandible. As a result of clinical and radiographic examinations, a horizontal ridge deficiency was detected on Cone Bean Computed Tomography (CBCT). In measurements taken in cross-section mode using CBCT, it was observed that the vertical height was sufficient for the placement of standard-sized implants Approximately 3 mm in width was detected in the maxillary anterior and mandibular posterior regions (Figure 1). Under local anesthesia, crestal osteotomies were performed using the W&H Piezomed SA-320 ultrasonic bone surgery unit (W&H Dentalwerk Bürmoos GmbH, Bürmoos, Austria), and controlled ridge expansion was achieved (Figure 2). Following standard implant bed preparation, a total of ten IS-III implants (3.5 × 11.5 mm; NeoBiotech Co., Ltd., Seoul, Republic of Korea) were placed, 4 in the maxillary anterior region and 6 in the mandible (Figure 3). The gaps around the implants were filled with particulate xenograft (MAGGI S.r.l., Andezeno, Italy), and the flaps were primarily closed with 3/0 synthetic absorbable sutures (Pegelag, Doğsan, Turkey). No complications were observed during the four-month osseointegration period, and the patient was referred for implant-supported fixed prosthetic rehabilitation.

2.2. Case 2

A sixty-seven-year-old systemically healthy male patient presented for implant-supported rehabilitation due to dissatisfaction with the total prostheses he had used for many years. A horizontal bone deficiency of approximately 3 mm in width was detected, especially in the maxillary anterior region, in the CBCT examination (Figure 4). Due to insufficient bone volume in the posterior regions, an All-on-4 treatment was planned for the maxilla. Controlled ridge expansion was performed following osteotomies performed with the aid of Piezomed SA-320 (Figure 5). Simultaneously, Four IS-III implants (3.5 × 11.5 mm; NeoBiotech Co., Ltd., Seoul, Republic of Korea) were placed. During surgery, a fracture occurred in the buccal cortical bone while placing the implant in the area corresponding to tooth number 12. The fractured cortical segment was stabilized to the palatal wall with a ligature wire, and the surgical procedure was completed (Figure 6). Particulate xenograft (MAGGI S.r.l., Andezeno, Italy) was applied to areas where there were deficiencies, and the flaps were primarily closed with 3/0 synthetic absorbable sutures (Pegelag, Doğsan, Turkey). During the four-month follow-up period, no infection, dehiscence, implant loss, or neurosensory complication was observed, and the patient was referred for prosthetic rehabilitation.

3. Discussion

Insufficient horizontal alveolar ridge width is a common issue in implant treatment. Nowadays, this condition can be managed using techniques such as autogenous block grafts, guided bone regeneration and distraction osteogenesis. As the ridge-splitting technique allows for the preservation of existing bone and the simultaneous placement of implants, it offers lower morbidity and a shorter treatment duration compared to alternative augmentation methods. (2,4,5).

There are numerous systematic reviews and meta-analyses in the literature evaluating the clinical success of the ridge split technique. In a meta-analysis encompassing 25 studies published by Lin et al., the average horizontal bone gain was reported as 3.35 mm (95% CI: 2.53–4.16 mm), The survival rate of the implants was reported to be 98.1% after a minimum follow-up of 5 years.(6). Similarly, in a systematic review evaluating 35 studies by Al Haydar et al., the average bone gain was found to be 3.06 mm, and the overall implant survival rate was 98.17%. In the same study, implant survival was reported as 97.72% in cases with simultaneous implant placement and 99.14% in delayed implant applications (7). In both cases presented, simultaneous implant

placement was performed in ridges approximately 3 mm wide, and no implant loss or biological complication was observed during the four-month follow-up period. These findings are consistent with the current literature.

Different modifications of the ridge split technique have been described. Elnayef et al. (2) evaluated procedures performed with a full-thickness flap (FTF) and a partial-thickness flap (PTF) and reported implant survival rates of 97% and 95.7%, respectively. In recent years, with the introduction of piezoelectric surgical systems, ultrasonic devices, and motorized expanders, surgical safety and predictability have been shown to increase. In a systematic review published by Manekar et al. (8), an average bone gain of 3.40 mm was achieved in applications performed with ultrasonic devices, while the overall implant survival rate was reported as 98.07%. Furthermore, a recent review published by Artzi emphasized that piezoelectric surgery reduces the risk of complications by allowing the creation of a controlled osteotomy (10). In the presented cases, all osteotomies were performed with the aid of piezoelectric surgery.

Successful results have also been reported in studies comparing the ridge split technique with other horizontal augmentation methods. In a systematic review conducted by Vorovenci et al. (11), the average horizontal bone gain was reported as 4.04 mm for Guided Bone Regeneration (GBR), 3.66 mm for ridge split, and 2.15 mm for osseodensification. Although GBR can provide higher bone gain, it has disadvantages such as the potential requirement for a second surgical procedure, a longer healing time, and increased cost. In contrast, the ridge split technique offers the advantages of a shorter treatment time and simultaneous implant placement. A comparative review by Starch-Jensen and Becktor (12) also reported that the split-crest technique provided similar implant survival with lower morbidity compared to the lateral block grafting method.

The most common complication reported in the literature about ridge split techique is buccal cortical bone fracture. Additionally, dehiscence, graft exposure, infection, paresthesia, and soft tissue recessions have also been reported (6-13). In the second presented case, a fracture occurred in the buccal cortical bone during implant placement; however, the surgical procedure was completed successfully by stabilizing the fractured segment. No infection, implant loss, or healing complication was observed during the follow-up period. This indicates that with an appropriate surgical approach and careful postoperative follow-up, certain intraoperative complications can be managed without negatively affecting clinical success.

4. Conclusion

The ridge split technique is a reliable and predictable method that allows for simultaneous implant placement in horizontal alveolar ridge deficiencies where adequate vertical bone height is present. Appropriate case selection, detailed radiological evaluation, and controlled surgical application are fundamental factors in achieving successful results.

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Figures

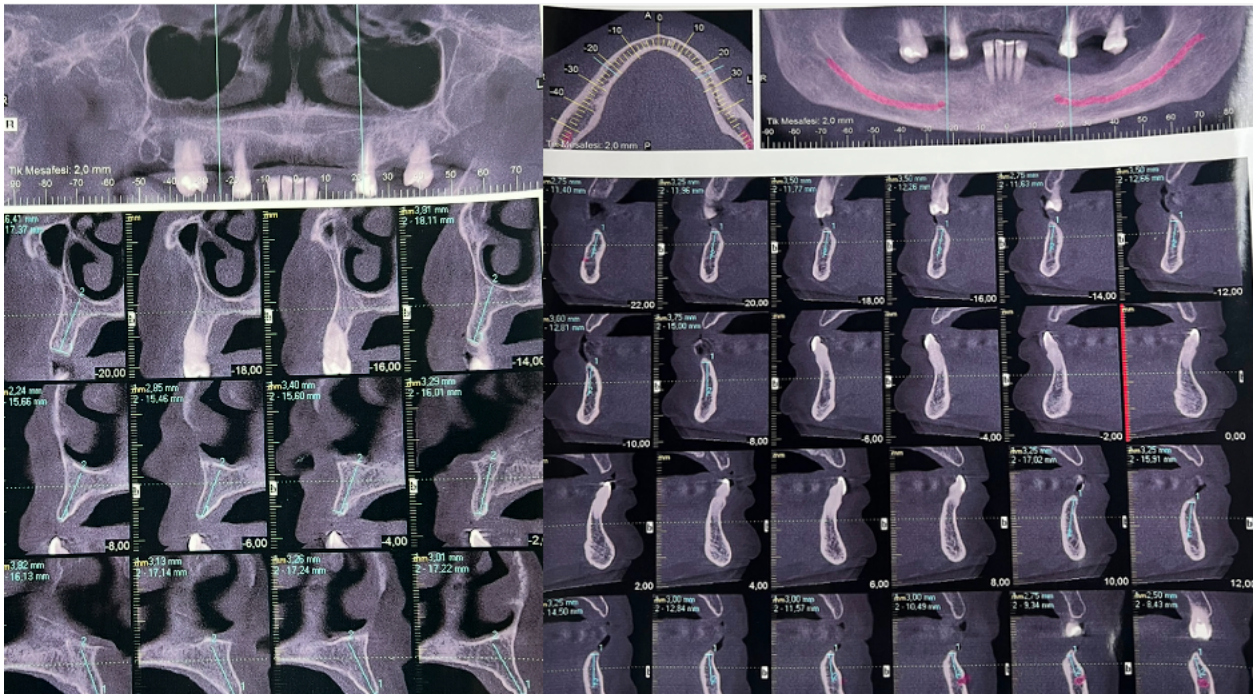

Figure 1: Case 1 preoperative CBCT cross sections.

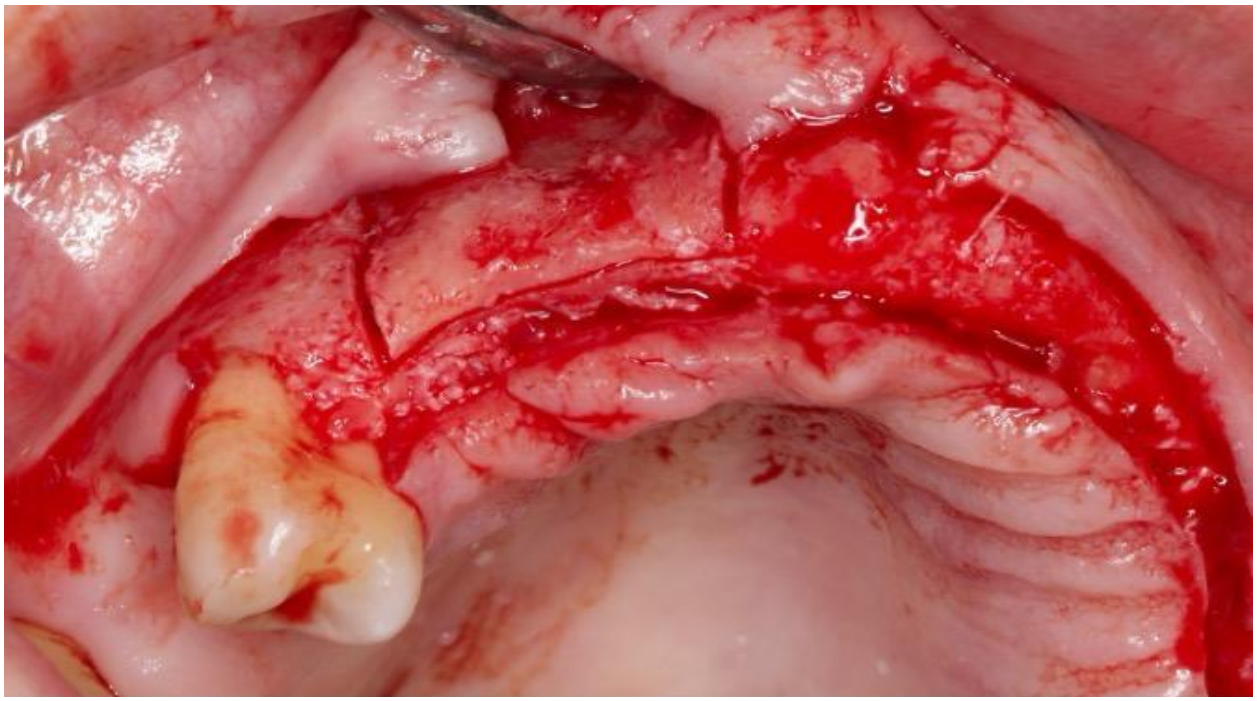

Figure 2: Osteotomy and ridge expansion procedure in the anterior region of the maxilla.

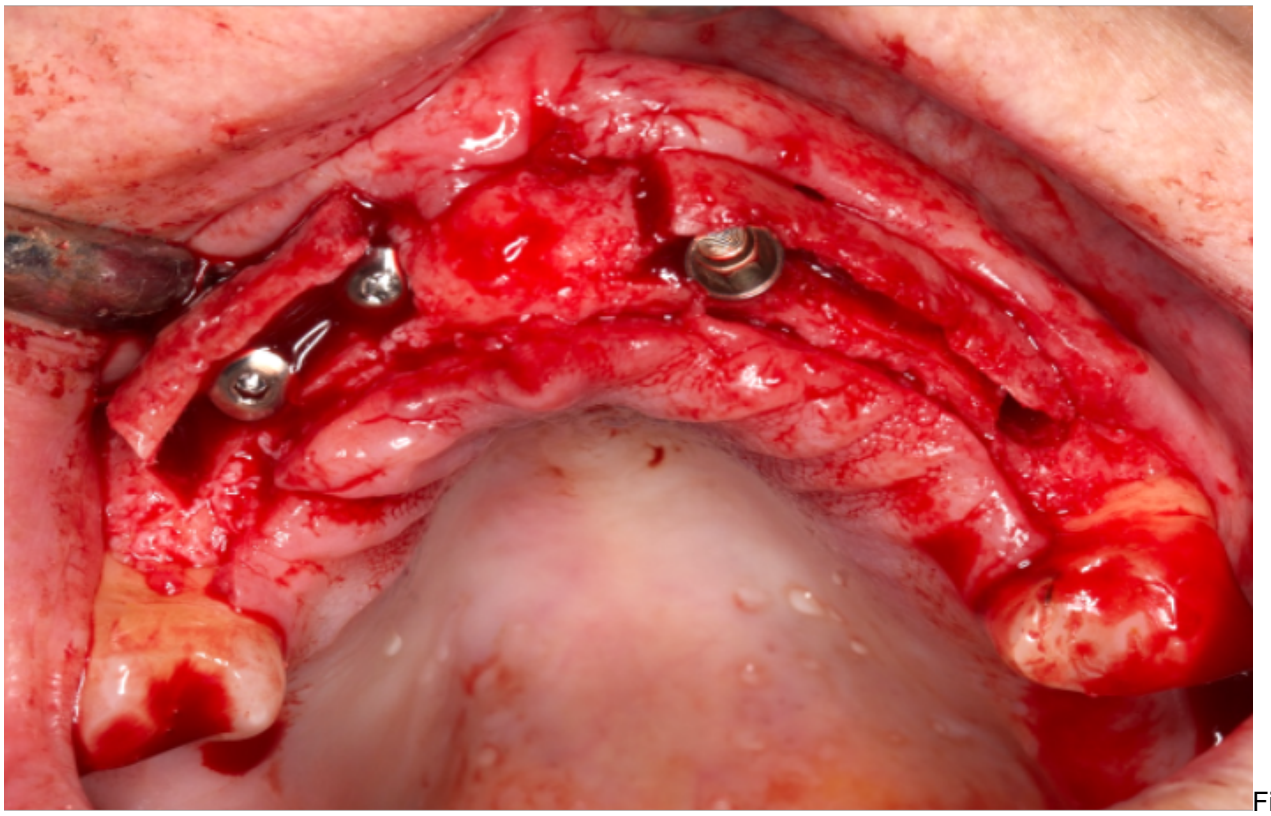

Figure 3: Simultaneous implant placement.

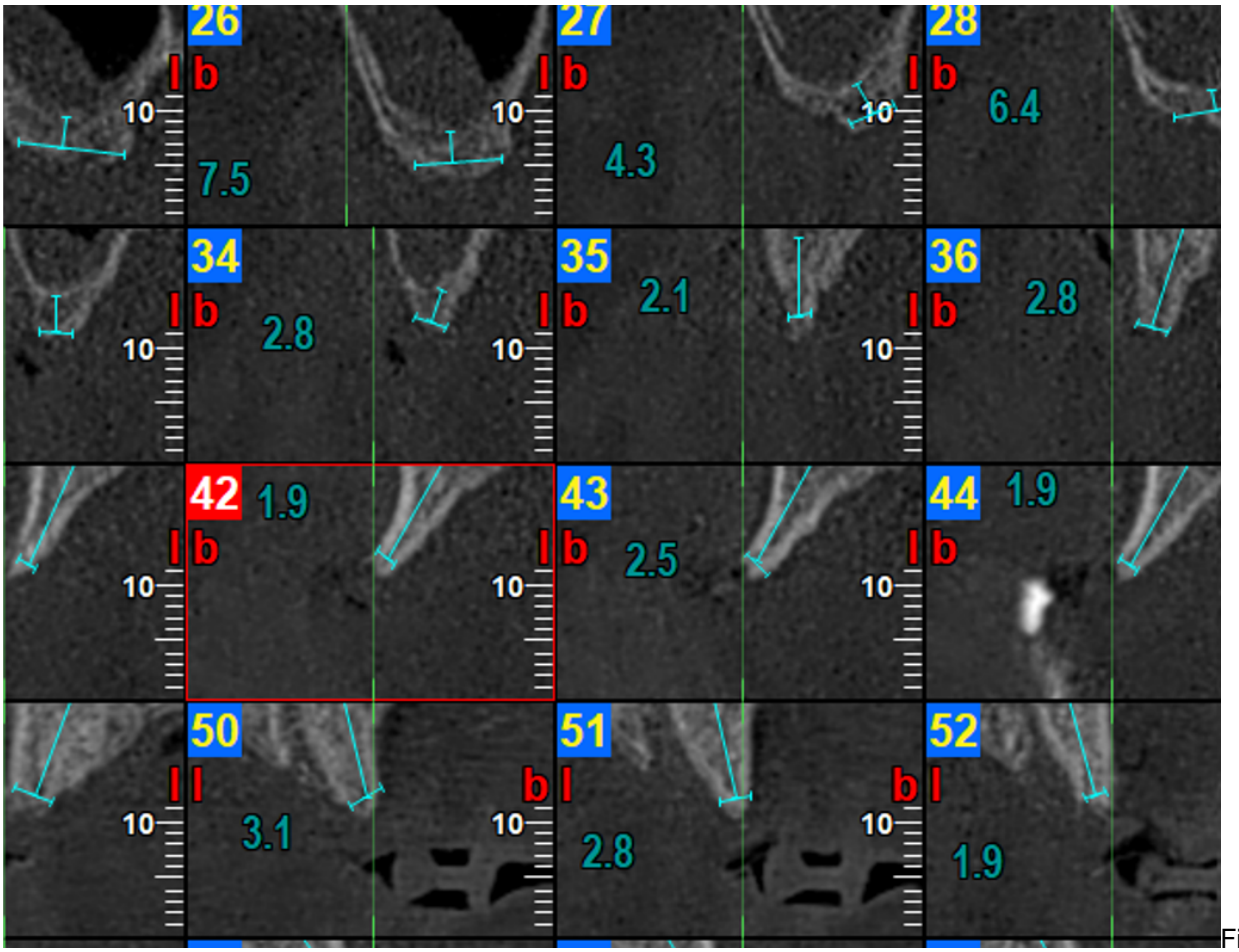

Figure 4: Case 2 preoperative CBCT cross secions.

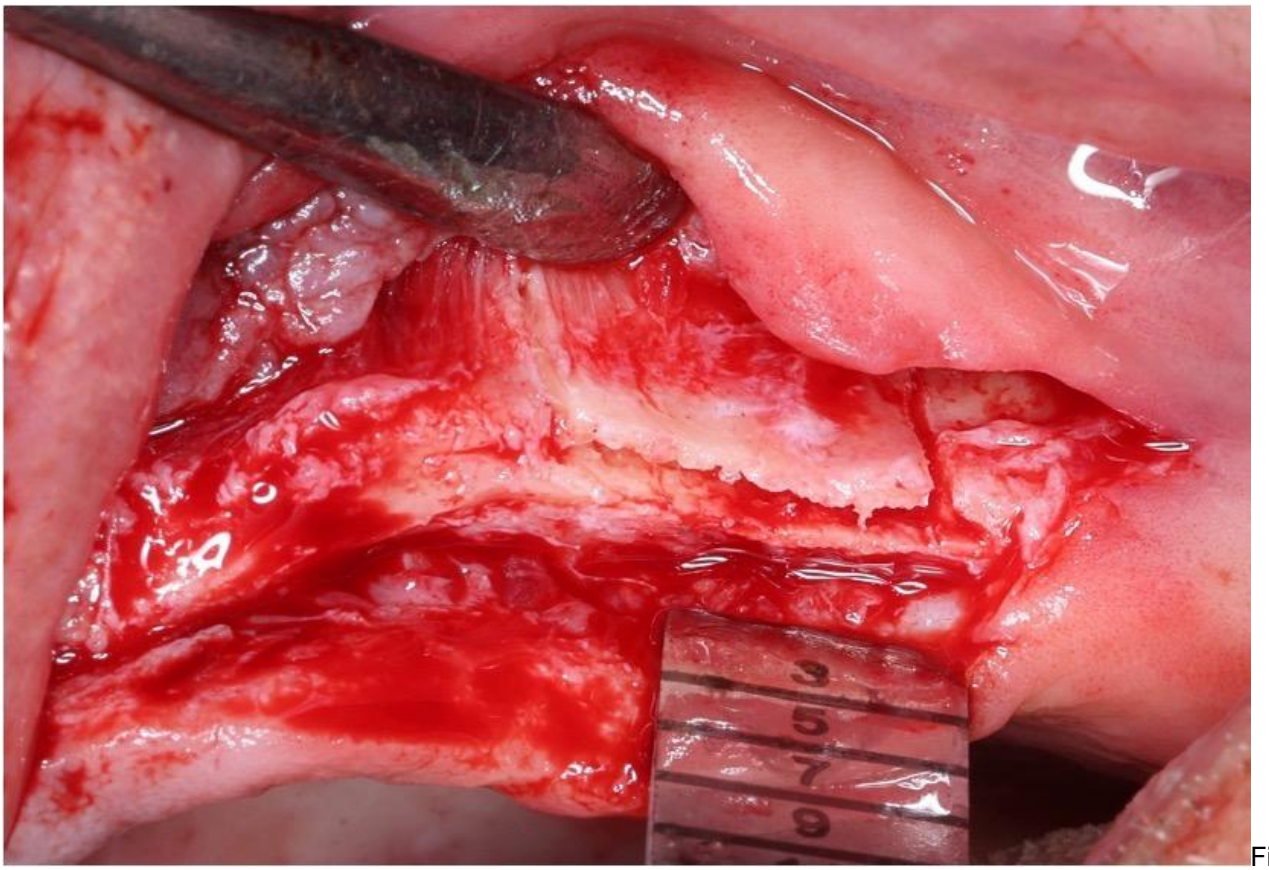

Figure 5: Osteotomy and ridge expansion procedure in the posterior region of the maxilla.

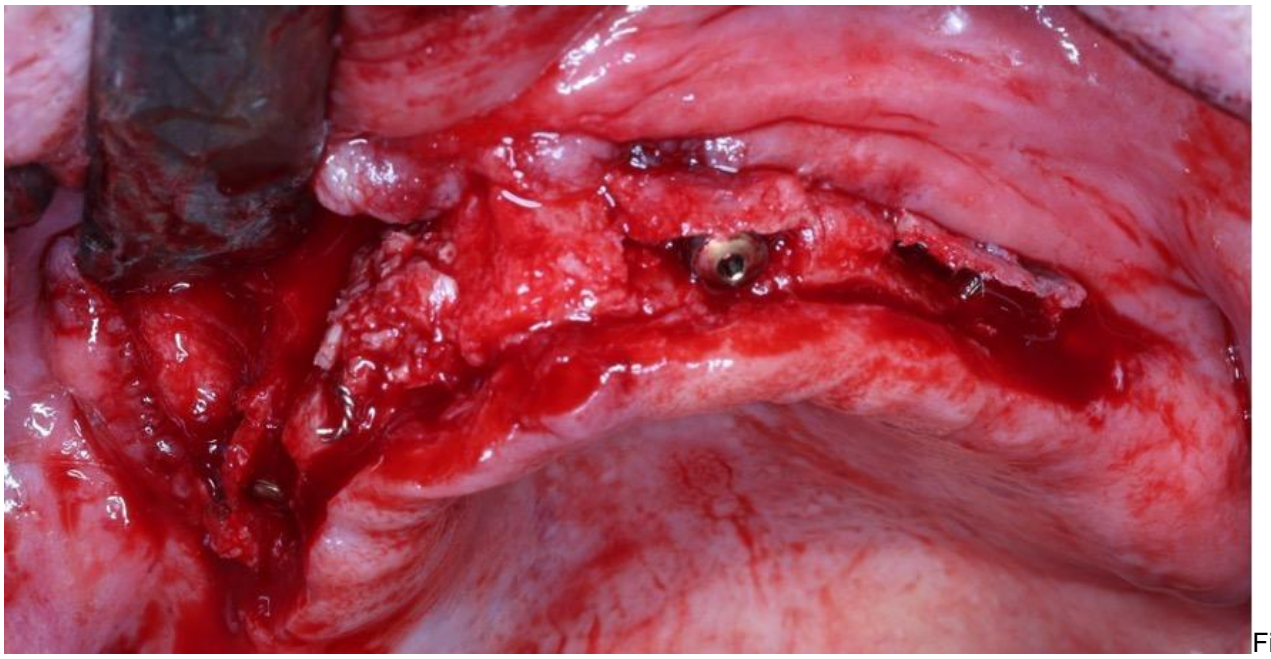

Figure 6: Simultaneous implant placement and grafting.

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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SS-106

NONDISPLACED MANDIBULAR FRACTURES: A CASE REPORT AND LITERATURE REVIEW ABSTRACT

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INTRODUCTION: Road traffic accidents (37.1%)are the leading cause of mandibular fractures, followed by assault (34.3%). The most common anatomical sites of fracture are the subcondylar region (27.3%) and the parasymphysis. (23.3%) The anatomical structure of the mandible and its position within the facial skeleton make it more susceptible to trauma. The correct diagnosis and treatment of these fractures are of great importance in terms of restoring occlusion to the patient, as well as from functional and aesthetic perspectives.

CASE REPORT: An 18-year-old male patient, who was otherwise in good general health, presented to our clinic complaining of an inability to fully close his teeth and pain following a blow to the face. Reconstruction was achieved using a miniplate and screws under local anaesthesia following open reduction. The patient underwent open reduction and internal fixation (ORIF), with stabilisation provided by a miniplate and screws. During the operation, the mental nerve was carefully dissected and protected. In the postoperative period, the patient was advised on appropriate medical treatment and oral hygiene. Follow-up examinations revealed that the patient's occlusion had been successfully restored, functional recovery was adequate, and bone healing was progressing without complications. Furthermore, it was observed that the paraesthesia resulting from the dissection of the mental nerve gradually subsided over a period of approximately six months.

CONCLUSION: The successful management of mandibular fractures depends on accurate diagnosis, appropriate surgical planning and the application of up-to-date treatment approaches. With clinical experience and appropriate surgical techniques, a low complication rate and high treatment success can be achieved. Consequently, the approach to treating mandibular fractures varies depending on the location and direction of the fracture. Following a comprehensive literature review, intermaxillary fixation using a four-week Erich arch bar and fracture reconstruction via a transoral approach were performed. All treatments carried out were supported by the literature and found to be consistent with it.

KEYWORDS: Parasymphyseal fracture, internal fixation, open reduction.

1. INTRODUCTION

The mandible is one of the most commonly fractured bones in the facial skeleton. This is due to its compact structure and the fact that it is the only mobile bone in the skull. The localisation and shape of fractures depend on the direction and magnitude of the force applied. Fractures may be direct or indirect, depending on the direction from which the force is applied. Whilst it is known that forces acting on the symphysis and canine region cause direct fractures, indirect fractures develop in the contralateral condyle (1).

This is due to the fact that, because of the mandible's anatomical structure, mechanical stress is not distributed evenly throughout the bone.

Forces acting on the mandible create areas of compression and tension. When occlusal forces are applied to the elevator and depressor muscles, they cause compression at the lower margin of the mandible and create stress zones in the alveolar region. Mandibular fractures most commonly occur in these stress zones. Stress is most pronounced in the condylar neck, angle, sigmoid notch and symphysis regions.

2. CASE PRESENTATION

An 18-year-old male patient, who was otherwise in good general health, presented to our clinic following an assault, complaining of an inability to close his mouth completely and pain. A fracture line was observed in the parasymphysis region on panoramic imaging. Panoramic radiographs have a sensitivity of 92% in the detection of fractures. (3)

Following a detailed medical history and extraoral and intraoral examinations, a maxillofacial CT scan was performed to rule out the suspicion of an indirect fracture. (2)

As a non-displaced fracture was identified in the patient, and there was an approximate 2 mm gap between the fracture lines indicating that bone union had not occurred, it was planned to perform miniplate osteosynthesis under local anaesthesia. (3)

In their study, Delaplain et al. investigated the effect of antibiotic use on the development of infection in facial fractures and found that antibiotic therapy lasting longer than 24 hours did not result in a significant difference. (4)

Access to the surgical site was achieved via a transoral approach with a single horizontal incision through the labial sulcus. Due to the mental nerve restricting the surgical view, dissection was performed through the periosteum. (5)

The horizontal incision was made starting from the external oblique muscle and continued 5–7 mm anteriorly and inferiorly.

3. DISCUSSION

The extraoral approach provides direct access to the fracture site but has disadvantages such as marginal mandibular nerve injury and scarring. Therefore, a transoral approach was preferred in this patient, who was

assessed as having good oral hygiene, was systemically healthy, had no neoplasms, and presented with a simple, single-piece fracture. (6)

Two mini-plate osteosynthesis procedures were performed, accompanied by 4 weeks of intermaxillary fixation. Following dissection of the mental nerve, the paraesthesia and anaesthesia were observed to be reversible within 6 months.

The patient was not administered preoperative prophylactic antibiotics. Postoperatively, a limited course of penicillin-group antibiotics (2 × 1 dose of 1000 mg), chlorhexidine mouthwash and NSAIDs were prescribed. A report published by the Surgical Infection Society in 2020 also indicated that the preoperative and postoperative antibiotic therapy administered by our team was consistent with the literature. (7)

The teeth in the extraction site were found to be vital; therefore, extraction was not required. A study in the literature involving 50 patients suggested that the presence of an infected tooth at the fracture line could lead to complications such as osteomyelitis and non-union (failure of the fracture to heal). The follow-up procedure carried out was supported by the literature. (8)

4. CONCLUSION

Mandibular fractures account for between 12 per cent and 56 per cent of all facial fractures. In cases of mandibular fractures, a detailed examination of the entire maxillofacial region must be carried out, and it should not be forgotten that direct parasymphysis fractures can lead to the development of an indirect contralateral condylar fracture. Parasymphysis fractures account for 35 per cent of mandibular fractures. (9)

Both closed and open reduction are suitable treatments for symphysis and parasymphysis fractures. In simple, non-displaced fractures, access to the symphysis and parasymphysis regions is easily achieved. In addition to double miniplate osteosynthesis, an Erich arch bar was applied for a period of 4 weeks. The use of arch bars has disadvantages such as prolonging the duration of surgery, causing periodontal damage, tooth extrusion and the generation of lateral forces. (10)

In the postoperative period, the patient’s complaints of pain, trismus and inability to close the mouth have completely resolved. Healthy union with ideal occlusion has been observed. The surgery on the patient, who underwent repair of a non-displaced parasymphysis fracture, was successfully performed, and follow-up examinations were carried out at 1, 3 and 6 months.

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BILATERAL ORAL WHITE LESIONS WITH DIFFERENT HISTOPATHOLOGICAL DIAGNOSES: A CASE REPORT

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Abstract

Objective: Oral white lesions encompass a wide differential diagnostic spectrum and may present with similar clinical features despite representing distinct histopathological processes. This report aims to demonstrate that clinically near-identical bilateral oral white lesions can yield different histopathological diagnoses, emphasizing the importance of independently evaluating each lesion focus.

Case: A 65-year-old systemically healthy male patient presented with bilateral, clinically similar white lesions on the edentulous posterior mandibular ridges, with a history of removable denture use. No regression was observed after two weeks of denture discontinuation. Separate biopsies were obtained from each side. Histopathological examination revealed oral lichen planus on the right side and leukoplakia on the left side. The patient was referred to dermatology, and topical corticosteroid treatment led to marked improvement, particularly on the lichen planus side, at the two-month follow-up.

Conclusion: Clinically similar bilateral white lesions may correspond to different histopathological entities. Each focus of a bilateral or multifocal oral white lesion should be assessed independently, with separate biopsy when indicated, to ensure accurate diagnosis and lesion-specific management.

Key Words: Oral Lichen Planus, Leukoplakia, Clinicopathological Correlation

1. Introduction

Oral white lesions represent a broad and heterogeneous differential diagnostic group, encompassing traumatic, infectious, immune-mediated, developmental, and potentially malignant processes (1,2). The clinical white appearance is most often the result of surface hyperkeratosis and epithelial thickening, which mask the underlying vascular network; in some lesions, a superficial pseudomembrane or debris may also produce a white surface (3). Because distinct biological processes can converge on a similar macroscopic white appearance, clinical inspection alone is frequently insufficient for a definitive diagnosis (4). This overlap is particularly relevant for plaque-type oral lichen planus (OLP) and leukoplakia, two lesions that are well recognized to mimic one another clinically despite fundamentally different biological behavior and malignant potential (3,5,6). In a digital texture analysis of intraoral photographs comparing leukoplakia, OLP, and healthy mucosa, 47% of OLP cases were misclassified as leukoplakia and 33% of leukoplakia cases were misclassified as OLP, demonstrating that the two entities can remain indistinguishable even under detailed image-based analysis (5). Furthermore, the presence of bilateral or multifocal white lesions does not imply that all foci necessarily share the same underlying pathology. This report presents a

case of clinically near-identical bilateral white lesions of the posterior mandibular ridge that, upon separate biopsy, yielded two different histopathological diagnoses, and discusses the findings in light of the current literature on clinical-histopathological discordance in oral white lesions.

2. Case Report

A 65-year-old systemically healthy male patient presented to our clinic with bilateral, clinically similar white lesions located on the edentulous posterior mandibular ridges (Figures 1,2). The patient had a long-standing history of removable denture use, and the lesions had been present for an unspecified period. Given the possibility of denture-related irritation, the patient was advised to discontinue denture use for two weeks and was recalled for follow-up. At the control visit, no regression was observed in either lesion. Despite the closely matching clinical morphology of the two foci, the possibility of differing underlying histopathology was considered, and separate incisional biopsies were obtained from each side rather than assuming a single, bilateral disease process.

Histopathological examination revealed two distinct diagnoses: the lesion on the right posterior mandible was reported as oral lichen planus, while the lesion on the left posterior mandible was reported as leukoplakia. Had only one side been sampled, the differing histopathological process on the contralateral side would have gone undetected.

The patient was subsequently referred to the dermatology department, and regular follow-up was recommended. At the two-month control visit (Figures 3,4), it was learned that a topical corticosteroid regimen had been initiated by the dermatology team. Marked clinical improvement was observed, particularly on the side diagnosed as OLP, while the leukoplakia-associated site showed a comparatively more indolent course. The patient remains under regular clinical follow-up.

3. Discussion

The clinical resemblance between OLP and leukoplakia observed in this case is consistent with a substantial body of literature documenting discordance between clinical impression and histopathological diagnosis in oral white lesions. Shimizu reported that 44.4% of lesions clinically diagnosed as OLP showed histopathological discordance, with leukoplakia being the most frequent alternative diagnosis among the discordant cases (7). Similarly, Enomoto et al. found that approximately one-third (34.9%) of lesions with a clinical diagnosis of OLP were histopathologically discordant, and more than half of these discordant lesions were ultimately reported as leukoplakia (8). In a preliminary clinicopathological correlation study, Mravak-Stipetić et al. found that only about 52.2% of clinically diagnosed OLP cases were histopathologically confirmed, underscoring how frequently clinical impression alone fails to predict the definitive diagnosis (9).

Beyond diagnostic discordance, the coexistence of OLP and leukoplakia within the same patient, as observed here, has also been documented at the population level. In a large retrospective series of 12,508 patients, Lončar Brzak et al. reported that OLP and leukoplakia coexisted in only 0.14% of cases, indicating that simultaneous bilateral presentation of two distinct lesions in one patient is genuinely uncommon (10). Notably, in that same series, malignant transformation was observed exclusively within the leukoplakia group, while no malignant transformation occurred among OLP cases, reinforcing the clinical importance of correctly distinguishing between the two entities

for risk stratification (10). McParland and Warnakulasuriya further demonstrated that among 51 cases eventually diagnosed with proliferative verrucous leukoplakia (PVL), 30 had initially been assessed clinically as OLP, suggesting that a lichenoid clinical appearance may mask an underlying high-risk leukoplakic process (11). Consistent with this bidirectional relationship, Chainani-Wu et al. described leukoplakia developing in patients with pre-existing OLP, further supporting the notion that these two lesions can coexist or evolve within the same patient over time (12).

Taken together, these findings support the central message of the present case: a similar clinical appearance does not equate to a shared diagnosis, and bilateral or multifocal white lesions should never be presumed to represent a single disease process without independent histopathological confirmation of each focus.

4. Conclusion

Clinically similar white lesions may represent different histopathological processes. In bilateral or multifocal presentations, each focus should be evaluated independently, and separate biopsies should be obtained when indicated, since this approach is essential for accurate diagnosis, appropriate risk stratification, and lesion-specific management. Similar clinical appearance does not equal the same diagnosis, and does not equal the same risk.

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6. Figures

Figure 1: Preoperative clinical appearance of the white lesion on the right posterior mandibular ridge, later diagnosed as oral lichen planus.

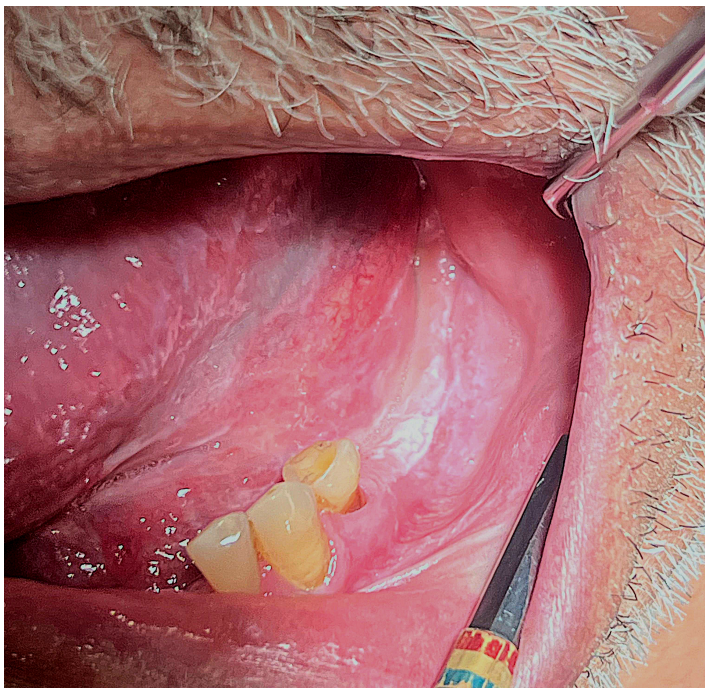

Figure 2: Preoperative clinical appearance of the white lesion on the left posterior mandibular ridge, later diagnosed as leukoplakia.

Figure 3: Clinical appearance of the right posterior mandibular (oral lichen planus) site at the two-month follow-up, after topical corticosteroid treatment.

Figure 4: Clinical appearance of the left posterior mandibular (leukoplakia) site at the two-month follow-up.

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Açık Sinüs Lifting Sonrası Gelişen Kronik Odontojenik Maksiller Rinosinüzitin Cerrahi Yönetimi: Olgu Sunumu

Özet

Giriş: Maksilla posterior bölgede diş kaybına bağlı gelişen kemik rezorpsiyonu ve sinüs pnömatizasyonu, implant tedavisini zorlaştıran başlıca anatomik değişikliklerdir. Bu durumun tedavisinde sinüs augmentasyonu yaygın olarak uygulanmakla birlikte, cerrahiye bağlı çeşitli postoperatif komplikasyonlar gelişebilmektedir. En sık görülen komplikasyon Schneiderian membran perforasyonu olarak raporlanmıştır.

Olgu: Kırk iki yaşındaki sistemik olarak sağlıklı erkek hasta, sol maksiller bölgede ağrı ve halitozis şikâyetleri ile başvurmuş olup anamnezinde aynı bölgede daha önce implant yerleştirilmesi ile birlikte açık sinüs lifting işlemi uygulandığı öğrenilmiştir. Klinik ve radyolojik değerlendirmelerde oroantral fistül, osseointegrasyon kaybı, maksiller sinüs ostium obstrüksiyonu ve sinüs içerisinde radyoopak yabancı cisim varlığı saptanmıştır. Cerrahi müdahalede inflamatuar ve yabancı materyaller uzaklaştırılmış, başarısız implant eksplante edilmiş ve oluşan defekt bukkal yağ yastığı ile rekonstrükte edilerek primer kapatma sağlanmıştır. Histopatolojik inceleme bulguları kronik rinosinüzit ile uyumlu olarak değerlendirilmiştir. Postoperatif 1 aylık takipte klinik ve radyolojik olarak patoloji saptanmamıştır.

Sonuç: Sinüs augmentasyonunda komplikasyon riskini azaltmak için olguların dikkatli planlanması, hastaların sistemik ve lokal durumlarının ayrıntılı değerlendirilmesi ve predispozan risk faktörlerinin preoperatif olarak belirlenmesi gereklidir. Ayrıca, ileri cerrahi girişimlerin deneyimli ve uzman cerrahlar tarafından gerçekleştirilmesi komplikasyonların önlenmesine katkı sağlar.

Anahtar kelimeler: Maksiller Sinüs Augmentasyonu, Odontojenik Rinosinüzit, Dental İmplant Komplikasyonları

1.GİRİŞ

Posterior maksillada diş kaybı sonrası gelişen fizyolojik kemik rezorpsiyonu ve sinüs pnömatizasyonu, implant tedavisi açısından önemli kısıtlayıcı faktörlerdir (1). Bu durumun yönetiminde sinüs augmentasyon teknikleri yaygın olarak kullanılmaktadır (2). Bu girişimlere bağlı olarak çeşitli postoperatif komplikasyonlar ortaya çıkabilmektedir. En sık bildirilen komplikasyon Schneiderian membran perforasyonudur (3, 4).

Membran perforasyonunu takiben açık sinüs cerrahisinde kronik rinosinüzit, kanama ve greft materyaline bağlı ostium tıkanıklığı; kapalı sinüs tekniklerinde ise benign paroksismal pozisyonel vertigo ve implant migrasyonu

gibi komplikasyonlar görülebilmektedir(5). Ayrıca, dental işlemler sırasında oluşan Schneiderian membran perforasyonunun odontojenik maksiller kronik rinosinüzitin önemli nedenlerinden biri olduğu ve olguların %5–40'ında iatrojenik dental etiyolojilerin rol oynadığı bildirilmektedir (6-8). Dental implant cerrahisi sonrası gelişen kronik maksiller rinosinüzitin nadir etiyolojik nedenleri arasında yer almakta olup olguların yaklaşık %2–11'ini oluşturmaktadır (9).

Bu olgu sunumunun amacı, posterior maksillada dental tedavi sonrası gelişen Schneiderian membran perforasyonu ve greft materyalinin sinüs içine yayılımına bağlı oluşan odontojenik maksiller sinüzitin cerrahi tedavisini sunmaktır.

2. Olgu sunumu

Kırk iki yaşında, sistemik hastalık öyküsü bulunmayan ve sigara kullanan erkek hasta, hastanemizin bünyesinde bulunan Kulak Burun Boğaz Kliniği'ne sol maksiller bölgede şiddetli ağrı ve halitozis şikâyetleri ile başvurdu. Hastanın anamnezinde, ilgili bölgede daha önce dental implant uygulamaları ile birlikte maksiller sinüs tabanı augmentasyonu (açık sinüs lift) işlemi gerçekleştirildiği öğrenildi. Bu bulgular doğrultusunda hasta ileri değerlendirme amacıyla kliniğimize konsülte edildi.

Detaylı anamnezde, yaklaşık üç yıl önce sol posterior maksilla bölgesinde dişsizlik rehabilitasyonu amacıyla iki dental implant planlandığı; ancak maksiller sinüs pnömatizasyonuna bağlı gelişen alveolar kemik hacmi yetersizliği nedeniyle lateral pencere tekniği ile sinüs augmentasyonu uygulandığı ve aynı seansta birinci premolar ile birinci molar dişlerin yerine dental implantların yerleştirildiği tespit edildi.

Klinik muayenede ilgili bölgede hiperemik mukoza, posterior bölgede oroantral fistül ve halitozis saptandı. Radyolojik incelemelerde, sol maksiller posterior bölgede 26 numaralı diş bölgesinde implantın mevcut olmadığı, 24 numaralı diş bölgesinde bulunan implantta ise osseointegrasyon kaybını düşündüren bulgular olduğu gözlendi (Şekil 1). Konik ışınlı bilgisayarlı tomografi (CBCT) değerlendirmesinde, sol nazal lateral duvarda nazal kavite ile maksiller sinüs arasında kemik bütünlüğünün kaybolduğu, maksiller sinüs ostiumunun obstrükte olduğu ve sinüs içerisinde radyoopak yabancı cisim varlığı tespit edildi.

Hasta yapılacak olan işlem hakkında bilgilendirildi, yazılı ve sözlü onam alındı. Hasta steril şartlarda operasyona hazırlandı ve işlem öncesinde antiseptik ağız gargarası uygulandı. İlgili bölgede lokal anestezi sonrasında tam kalınlık mukoperiostal flep kaldırılarak önceki cerrahi sahaya ulaşıldı (Şekil 2). Maksiller sinüs içerisinde viskoz mukoid içerik gözlendi. İnflame Schneiderian membran ile ilişkili kistik lezyon eksize edildi (Şekil 3)ve sinüs kavitesi serum fizyolojik ile irrigasyon yapıldı.

CBCT bulgularıyla uyumlu olarak, apertura piriformis düzeyinde kemik perforasyonu nedeniyle nazal mukoza ile maksiller sinüs arasında direkt ileti olduğu intraoperatif olarak doğrulandı. 26 numaralı diş bölgesinde implant soketinde bulunan granülasyon dokusu küretaj ile uzaklaştırıldı. 24 numaralı diş bölgesindeki implant ise osseointegrasyonun kaybı nedeniyle trephine frez yardımıyla çıkarıldı.

Defekt bölgesinin rekonstrüksiyonu amacıyla bukkal yağ yastığı (Bichat yağ dokusu) mobilize edilerek cerrahi alana pozisyonlandırıldı. Ardından flep primer olarak kapatıldı (Şekil 4). Postoperatif dönemde hastaya oral amoksisilin-

klavulanik asit (1 g, günde iki kez), metronidazol (500 mg, günde 2–3 kez), ibuprofen (400 mg, gerektiğinde) ve antiseptik ağız gargarası reçete edilmiştir.

Operasyon sırasında elde edilen intrasinüzal materyaller histopatolojik inceleme amacıyla patoloji anabilim dalına gönderildi.

Histopatolojik değerlendirme sonucunda kronik inflame sinonazal mukoza ve mukoid materyal varlığı raporlandı. Hasta, 1. ay klinik ve radyolojik takiplerinde herhangi bir komplikasyon saptanmamıştır.

3. TARTIŞMA

Maksiller sinüs tabanı augmentasyonu, posterior maksillada vertikal kemik yetersizliğinin implant destekli protetik rehabilitasyonunda yaygın olarak uygulanan ve uzun dönem sonuçları genel olarak öngörülebilir kabul edilen bir cerrahi prosedürdür. Bununla birlikte, maksiller sinüsün anatomik varyasyonları, Schneiderian membranın kalınlığı ve elastikiyeti, rezidüel kemik yüksekliği, sinüs septalarının varlığı, eşlik eden sinonazal patolojiler ve cerrahi deneyim komplikasyon riskini doğrudan etkileyebilmektedir. Güncel derlemelerde sinüs lifting prosedürlerinde en sık bildirilen intraoperatif komplikasyonun Schneiderian membran perforasyonu olduğu belirtilmektedir. Membran perforasyonu, greft materyalinin sinüs kavitesine yayılması, mukosiliyer klirensin bozulması, ostium obstrüksiyonu, greft enfeksiyonu, postoperatif sinüzit ve implant osseointegrasyon kaybı açısından önemli bir predispozan faktör olarak değerlendirilmektedir (10, 11).

Lyu ve ark. maksiller sinüs tabanı augmentasyonuna ilişkin güncel kanıtları değerlendirdikleri derlemede, Schneiderian membran perforasyonunun yalnızca mekanik bir komplikasyon olarak ele alınmaması gerektiğini; membranın inflamatuvar durumu, kalınlığı, elastikiyeti ve sinüs anatomisinin cerrahi risk üzerinde belirleyici olduğunu vurgulamıştır (11). Sinüs tabanı augmentasyonuna bağlı komplikasyonların sistematik olarak değerlendirildiği çalışmalarda, membran perforasyonunun en sık komplikasyon olduğu, bunu greft kaybı, postoperatif sinüzit, enfeksiyon, yara dehisensi, implant kaybı ve oroantral fistül gibi komplikasyonların izlediği bildirilmektedir (10). Odontojenik maksiller sinüzit, maksiller sinüs mukozasının komşu dental enfeksiyonlar veya dental girişimlere bağlı iatrojenik nedenlerle inflamasyonu olarak tanımlanmaktadır. Güncel konsensüs raporları, odontojenik maksiller sinüzitin klasik rinolojik sinüzitten farklı bir etiyopatogeneze sahip olduğunu ve bu nedenle yalnızca medikal rinosinüzit tedavisiyle yönetilmesinin çoğu olguda yetersiz kalabileceğini belirtmektedir (12, 13).

Lin ve ark. tarafından yayımlanan 2024 tarihli multidisipliner konsensüs raporunda odontojenik maksiller sinüzitin tanı ve tedavisinde kulak burun boğaz uzmanları ile diş hekimleri/çene cerrahları arasında ortak karar sürecinin gerekli olduğu vurgulanmıştır (12-14).

Sunulan olguda kronik odontojenik maksiller rinosinüzitin temel patogenezinin, önceki açık sinüs lifting işlemi sonrasında Schneiderian membran bütünlüğünün bozulması ve greft/yabancı materyalin sinüs kavitesine yayılması ile ilişkili olduğu düşünülmektedir. CBCT değerlendirmesinde sinüs içinde radyoopak yabancı cisim varlığı, maksiller sinüs ostium obstrüksiyonu, osseointegrasyon kaybı ve oroantral fistül saptanması bu mekanizmayı desteklemektedir. Literatürde greft materyali veya dental implantların sinüs içine migrasyonu, mukosiliyer klirensi bozarak kronik inflamasyonun devam etmesine ve standart antibiyotik tedavisine dirençli sinüzit tablosuna yol açabilmektedir (15-18).

Schwarz ve ark. da 407 sinüs augmentasyonu prosedürünü değerlendirdikleri çalışmada, membran perforasyonu olan olgularda postoperatif sinüzit prevalansının daha yüksek olduğunu ve sigara kullanımının komplikasyon riskini artırabilecek bir hasta faktörü olduğunu bildirmiştir (4).

Odontojenik sinüzitin tedavisinde temel prensip, yalnızca sinüs mukozasındaki inflamasyonu baskılamak değil, altta yatan odontojenik kaynağı ortadan kaldırmaktır. Bu nedenle başarısız implantın çıkarılması, enfekte veya migre greft materyalinin uzaklaştırılması, granülasyon dokusunun küretajı, oroantral fistülün kapatılması ve sinüs drenajının yeniden sağlanması tedavinin ana bileşenleridir (12, 13, 19). Antibiyotik tedavisi, özellikle akut

enfeksiyon kontrolü ve postoperatif destek açısından önemlidir; ancak yabancı cisim, fistül veya nekrotik/enfekte dental odak varlığında tek başına yeterli değildir.

Cerrahi tedavi seçenekleri arasında intraoral yaklaşım, Caldwell–Luc yaklaşımı, fonksiyonel endoskopik sinüs cerrahisi ve kombine yaklaşımlar yer almaktadır. Güncel literatürde, seçilmiş olgularda dental odağın ortadan kaldırılması ile eş zamanlı FESS uygulanmasının yüksek başarı oranları sağladığı bildirilmektedir (19-22). Allevi ve ark. dental implantasyon sonrası gelişen sinüzitin tedavisini değerlendirdikleri sistematik derleme ve meta-analizde, endoskopik sinüs cerrahisinin en sık tercih edilen tedavi yöntemi olduğunu ve yüksek başarı oranları ile ilişkili bulunduğunu rapor etmiştir(19). Rangics ve ark. ise tek seanslı FESS ve dentoalveolar cerrahinin daha az invaziv, etkili ve düşük retreatment oranına sahip bir yaklaşım olduğunu bildirmiştir (20).

Sakkas ve ark. 164 odontojenik maksiller sinüzit hastasını değerlendirdikleri çalışmada, cerrahi sonrası rekürrens oranını %5,48 olarak bildirmiş; dental odağın eliminasyonu ve sinüs revizyonunun başarılı sonuçlar sağladığını, ancak multidisipliner karar sürecinin önemini vurgulamıştır (21). Bu nedenle sunulan olguda KBB kliniği ile birlikte değerlendirme yapılması ve odontojenik odağın cerrahi olarak ortadan kaldırılması literatürle uyumludur.

Oroantral fistül varlığı, odontojenik sinüzitin devamlılığı açısından önemli bir faktördür. Fistül traktı yoluyla oral kavite florasının maksiller sinüse sürekli geçişi, kronik inflamasyonun devam etmesine neden olabilir. Posterior maksilladaki oroantral açıklıkların kapatılmasında bukkal yağ yastığı güvenilir bir rekonstrüksiyon seçeneğidir. Zengin vaskülarizasyonu, kolay mobilizasyonu, posterior maksillaya anatomik yakınlığı ve enfekte sahalarda kullanılabilirliği önemli avantajlarıdır(21, 23). Sunulan olguda defektin bukkal yağ yastığı ile kapatılması, hem oroantral iletiyi ortadan kaldırmak hem de enfekte cerrahi sahada vaskülarize doku desteği sağlamak açısından uygun bir tedavi seçeneğidir.

Sakkas ve ark. çalışmalarında multilayer closure ve bukkal yağ yastığı kullanımının rekürrens üzerinde istatistiksel olarak anlamlı bir risk faktörü olmadığını bildirmiştir (21). Bu bulgu, bukkal yağ yastığının uygun endikasyonda güvenilir bir yöntem olduğunu desteklemektedir. Bununla birlikte, geniş defektlerde, aktif enfeksiyon varlığında veya sinüs drenajının bozulduğu olgularda yalnızca fistül kapatılması yeterli olmayabilir; eş zamanlı sinüs içi enfekte dokuların temizlenmesi ve gerekli olgularda endoskopik drenajın sağlanması gerekir.

Sigara kullanımı, implant cerrahisi ve sinüs augmentasyonu sonuçları açısından eleştirel değerlendirilmesi gereken bir faktördür. Bazı çalışmalarda sigaranın membran perforasyonu ile doğrudan ilişkisi net gösterilememiş olsa da, yara iyileşmesinin gecikmesi, enfeksiyon riski, implant başarısızlığı ve postoperatif komplikasyonlar açısından olumsuz etkileri olduğu bilinmektedir (4). Sunulan olguda hastanın sigara kullanıyor olması primer etiyolojik neden olarak değerlendirilmemelidir; ancak enfeksiyonun kronikleşmesine, yumuşak doku iyileşmesinin bozulmasına ve implant başarısızlığına katkıda bulunmuş olabilecek sekonder risk faktörü olarak tartışılmalıdır.

Sunulan olgu, tek başına nadir bir vaka olarak değil, sinüs augmentasyonu sonrası gelişebilecek komplikasyon zincirini göstermesi açısından önemlidir. Bu zincirde ilk basamak büyük olasılıkla membran bütünlüğünün bozulması veya sinüs içine materyal migrasyonu; ikinci basamak ostium obstrüksiyonu ve mukosiliyer klirensin bozulması; üçüncü basamak kronik inflamasyon ve enfeksiyon; son basamak ise implant kaybı ve oroantral fistül gelişimidir.

4. SONUÇ

Sinüs augmentasyonu planlanan hastalarda preoperatif CBCT ile sinüs anatomisi, mukozal durum, ostium açıklığı, septa varlığı, rezidüel kemik yüksekliği ve dental enfeksiyon odakları dikkatle değerlendirilmelidir. Aktif sinonazal semptom, odontojenik enfeksiyon, geniş mukozal patoloji veya sinüs drenaj bozukluğu bulunan hastalarda cerrahi öncesi multidisipliner değerlendirme yapılmalıdır. Sinüs lifting sonrası gelişen odontojenik maksiller rinosinüzit olgularında ise yalnızca antibiyotik tedavisi yeterli görülmemeli; başarısız implant, enfekte greft materyali, yabancı cisim ve oroantral fistül gibi devam eden enfeksiyon kaynakları cerrahi olarak ortadan kaldırılmalıdır.

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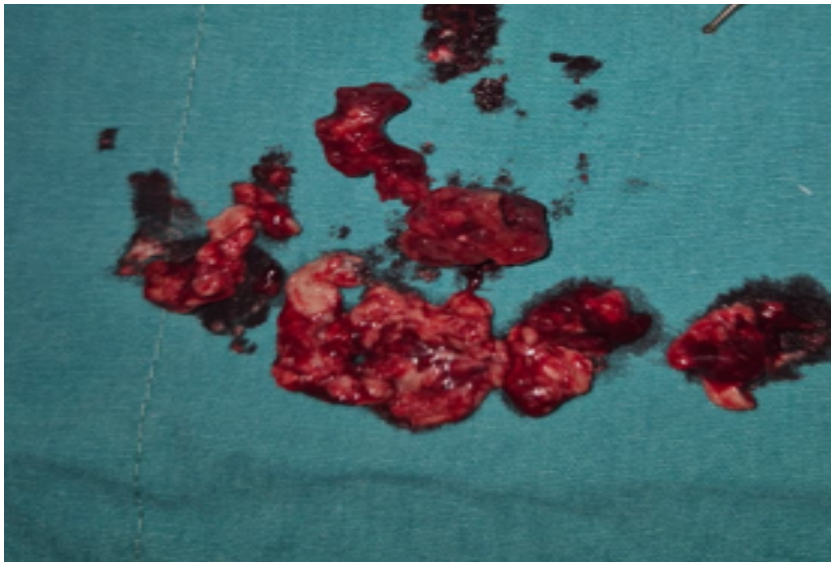
6. Figürler

Şekil 1: 24 numaralı diş bölgesinde implant çevresinde radyolusenti ve radyoopak cisimlerin görünümü

Şekil 2: İntraoperatif görünüm



Şekil 3: Sinüs içerisinden çıkarılan mukoid lezyonlar

Şekil 4: Flebin primer kapatılması

SS-113

Two Distinct Clinical Courses of Adenoid Cystic Carcinoma

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Abstract

Objective: Adenoid cystic carcinoma (ACC) is a rare malignant salivary gland neoplasm characterized by slow but infiltrative growth, perineural invasion, frequent local recurrence and delayed distant metastasis. Because its clinical and radiographic features often mimic benign or odontogenic lesions; early diagnosis remains challenging. This report presents two patients with histopathologically confirmed ACC who exhibited markedly different clinical courses despite sharing the same diagnosis.

Case Report: A 54-year-old woman presented with a painful swelling in the right posterior maxilla. Following an incisional biopsy, ACC was diagnosed. Whole-body positron emission tomography/computed tomography (PET/CT) revealed no evidence of metastatic disease. The patient underwent wide surgical excision followed by adjuvant radiotherapy and was subsequently rehabilitated with laser-assisted vestibuloplasty and a maxillary complete denture, with no evidence of recurrence during follow-up. In contrast, a 55-year-old woman presented with a mandibular lesion that was initially diagnosed as an odontogenic lesion and treated by enucleation. Histopathological examination unexpectedly revealed cribriform-type ACC. Subsequent PET/CT demonstrated extensive metastases involving the lungs, mediastinum, vertebrae and cranial structures. Despite multidisciplinary oncologic management, the patient experienced rapid disease progression and died shortly after diagnosis.

Conclusion: These contrasting cases demonstrate the heterogeneous biological behavior of ACC and emphasize that similar histopathological diagnoses may result in markedly different clinical outcomes. Early biopsy, histopathological confirmation, comprehensive staging and multidisciplinary management are essential for timely diagnosis, appropriate treatment planning and improved patient outcomes.

Keywords: Adenoid cystic carcinoma, Neoplasm, Invasion

1. Introduction

Adenoid cystic carcinoma (ACC) is a rare malignant epithelial neoplasm accounting for approximately 1% of all head and neck malignancies and 10% of salivary gland tumors (1,2). It predominantly arises from the minor salivary glands and is characterized by slow but infiltrative growth, frequent perineural invasion, a high rate of local recurrence and delayed distant metastasis; resulting in an unpredictable clinical course despite its relatively indolent behavior (1–4). Long-term prognosis is primarily influenced by tumor stage, perineural invasion, surgical margin status and the presence of distant metastasis, emphasizing the importance of prolonged follow-up (2,4).

The clinical and radiographic presentation of ACC is often nonspecific and may closely resemble benign salivary gland tumors or odontogenic lesions, particularly in the early stages of the disease, making early diagnosis challenging (1,5–8). Primary intraosseous ACC of the jaws is exceptionally rare and is frequently misdiagnosed because of its overlapping clinical and radiographic features with odontogenic cysts and tumors (5,6). Histopathological examination remains the gold standard for definitive diagnosis, whereas advanced imaging modalities, including magnetic resonance imaging (MRI) and positron emission tomography/computed tomography (PET/CT) are essential for evaluating perineural spread, determining disease extent, and detecting distant metastasis before treatment (3,5,9).

Complete surgical excision with histologically negative margins remains the cornerstone of treatment for localized ACC, while postoperative radiotherapy is recommended in selected patients with adverse pathological features (2,4). Nevertheless, recurrence and distant metastasis may occur many years after primary treatment, highlighting the aggressive biological potential of this uncommon malignancy (2,4).

The present report describes two patients with histopathologically confirmed ACC who exhibited markedly different clinical courses despite sharing the same diagnosis. These contrasting cases

emphasize the importance of early biopsy, comprehensive staging, multidisciplinary management in achieving timely diagnosis and optimizing clinical outcomes.

2. Case

Case 1

A 54-year-old woman was referred to the Department of Oral and Maxillofacial Surgery with a one-year history of progressively enlarging pain and swelling in the right posterior maxillary buccal mucosa. Her medical history was remarkable only for well-controlled hypothyroidism managed with levothyroxine. Clinical examination revealed a firm, slightly ulcerated soft tissue mass extending from the posterior maxillary alveolar ridge to the adjacent buccal mucosa (Figure 2).Panoramic radiography demonstrated no evidence of maxillary bone destruction.(Figure 1-3)

Considering the clinical features and the suspicion of a malignant salivary gland neoplasm, an incisional biopsy was performed. Histopathological examination confirmed the diagnosis of adenoid cystic carcinoma (Figure 4-5). Contrast-enhanced imaging and whole-body positron emission tomography/computed tomography (PET/CT) showed no cervical lymph node involvement or distant metastatic disease.

The patient subsequently underwent wide surgical excision with histologically negative margins, followed by adjuvant radiotherapy (66 Gy in 33 fractions). During postoperative follow-up, scar contracture resulted in reduced vestibular depth, compromising prosthetic rehabilitation. Laser-assisted vestibuloplasty was successfully performed to deepen the vestibule, enabling rehabilitation with a maxillary complete denture (Figure 6-7). At the latest follow-up, the patient remained free of local recurrence and distant metastasis, with satisfactory functional and prosthetic outcomes.(Figure 8)

Case 2

A 55-year-old woman presented with a painless swelling in the mandibular canine-premolar region. Intraoral examination revealed a localized swelling covered by intact mucosa, while panoramic radiography demonstrated a well-circumscribed unilocular radiolucent lesion (Figure 9-10-11). Based on the clinical and radiographic findings, an odontogenic cystic lesion was considered the most likely diagnosis, and surgical enucleation was performed.(Figure 12-13-14)

Unexpectedly, histopathological examination revealed a cribriform-type adenoid cystic carcinoma arising within the mandible (Figure 13). Following the definitive diagnosis, whole-body

PET/CT demonstrated widespread metastatic disease involving the lungs, mediastinal lymph nodes, vertebrae, and cranial structures. The patient was referred for multidisciplinary oncologic management; however, owing to the advanced stage of the disease at presentation, rapid clinical deterioration occurred despite subsequent treatment, and the patient died shortly thereafter.

3. Discussion

Adenoid cystic carcinoma (ACC) is an uncommon malignant salivary gland tumor characterized by slow but infiltrative growth, a marked tendency for perineural invasion, high local recurrence rates, and delayed distant metastasis (1,2,4). Despite its relatively indolent clinical course, ACC exhibits highly variable biological behavior and long-term survival is largely influenced by tumor stage, surgical margin status, perineural invasion and distant metastatic spread (2,4). Because recurrence and metastasis may occur many years after primary treatment, prolonged follow-up is recommended for all patients with ACC (2,4).

The diagnosis of ACC remains challenging because its clinical and radiographic findings frequently overlap with those of benign salivary gland tumors and odontogenic lesions (1,3,5). Pain may be an early symptom due to perineural invasion; however, many patients present with painless, slowly enlarging masses, often resulting in delayed diagnosis (1,8). Advanced imaging plays a crucial role in disease evaluation. MRI is considered the most reliable modality for assessing perineural extension, whereas PET/CT contributes to the detection of regional and distant metastases and facilitates accurate staging and treatment planning (3,5). Nevertheless, histopathological examination remains the definitive diagnostic method.

The first patient in the present report demonstrated the importance of early clinical suspicion and prompt tissue diagnosis. Incisional biopsy followed by comprehensive staging enabled appropriate surgical treatment with histologically negative margins and adjuvant radiotherapy, resulting in favorable oncologic and functional outcomes. Similar multidisciplinary management has been associated with improved local disease control in previous studies (2,4).

In contrast, the second patient illustrates the diagnostic difficulty of primary intraosseous ACC. The lesion initially mimicked an odontogenic cystic lesion both clinically and radiographically, leading to enucleation before the diagnosis of malignancy was established. Similar diagnostic challenges have been reported in previous case reports and systematic reviews of intraosseous ACC, emphasizing that this rare entity should be considered in the differential diagnosis of persistent radiolucent jaw lesions (6,7,10). Following histopathological diagnosis, PET/CT revealed extensive

metastatic disease involving the lungs, mediastinum, vertebrae, and cranial structures, reflecting the aggressive biological potential of ACC despite its deceptively benign initial presentation.

Complete surgical excision with tumor-free margins remains the cornerstone of treatment for localized ACC, while postoperative radiotherapy is recommended in patients with adverse pathological features, including advanced-stage disease, positive or close surgical margins, and perineural invasion (2,4). Although recent advances in molecular targeted therapies and immunotherapy have shown encouraging results in selected patients with recurrent or metastatic disease, surgery combined with radiotherapy remains the standard therapeutic approach for resectable tumors (4). Consequently, accurate diagnosis and early treatment remain the most important determinants of prognosis.

Although limited by the small number of cases, this report demonstrates the heterogeneous biological behavior of ACC. The markedly different clinical outcomes observed in two patients with the same histopathological diagnosis emphasize that prognosis depends not only on tumor histology but also on disease stage at diagnosis and the timely implementation of appropriate multidisciplinary treatment.

4. Conclusion

Adenoid cystic carcinoma should be included in the differential diagnosis of persistent oral soft tissue and intraosseous lesions, even when clinical and radiographic findings suggest a benign odontogenic process. The present cases demonstrate the heterogeneous biological behavior of ACC and highlight the importance of early biopsy, histopathological confirmation, comprehensive imaging-based staging, and multidisciplinary management. Early diagnosis remains the most effective strategy for improving prognosis, while long-term follow-up is essential because recurrence and distant metastasis may occur years after primary treatment.

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6. Figures:

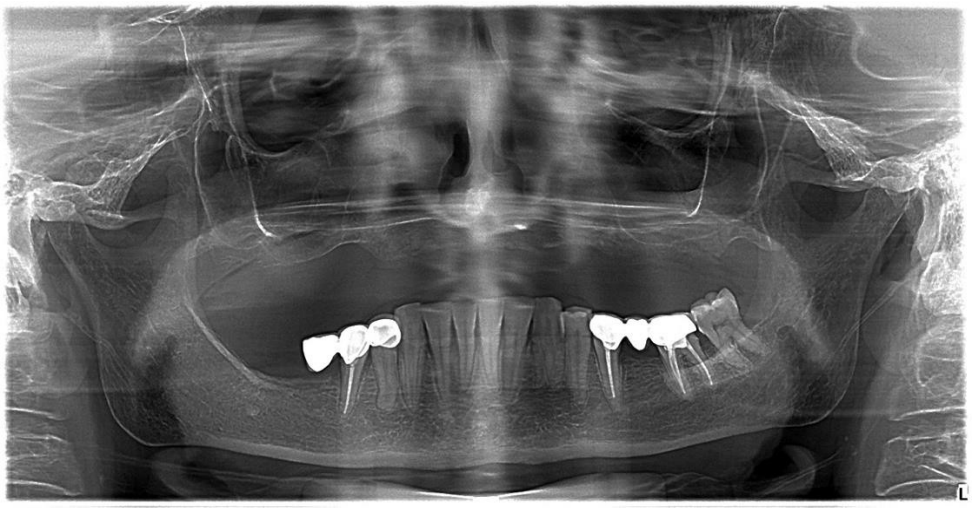

Figure 1. Panoramic radiograph of the patient

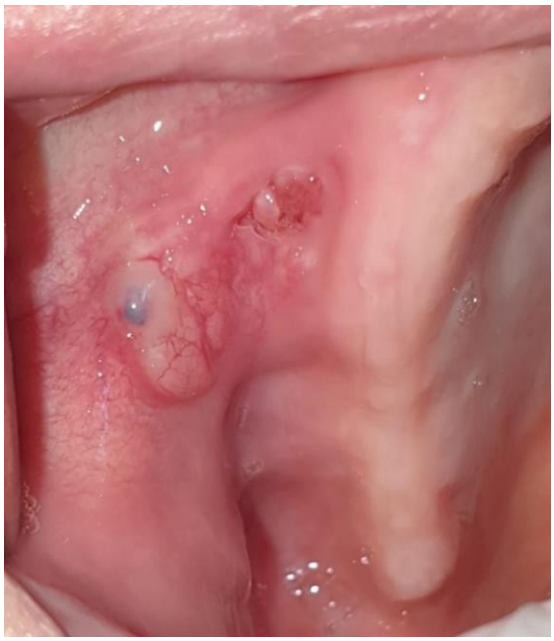

Figure 2. Ulcerated area of the oral mucosa observed during the intraoral examination

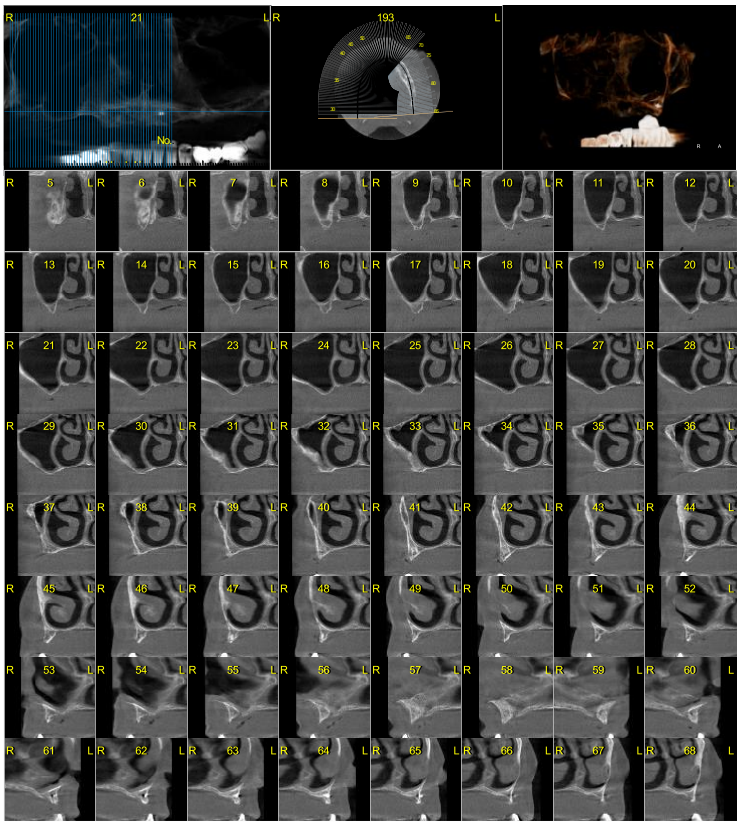

Figure 3. Computed tomography (CT) images of the patient

Figure 4. Surgically excised specimen

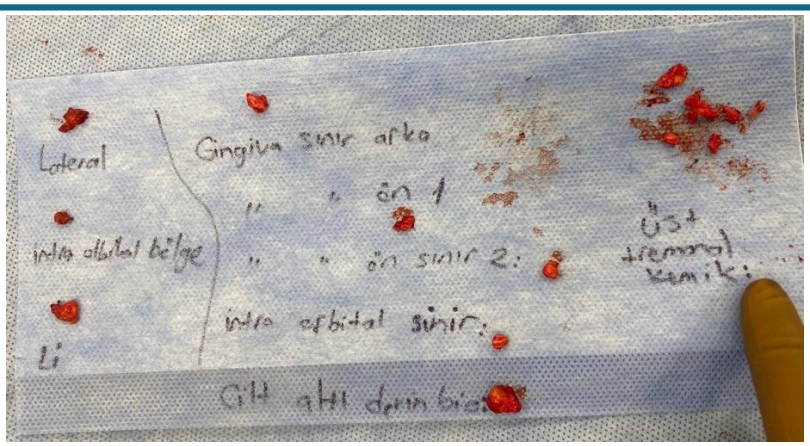

Figure 5. Representative tissue specimens obtained from the surgical margins

Figure 6. Preoperative view before vestibuloplasty

Figure 7. Immediate postoperative intraoral view following vestibuloplasty

Figure 8. Final view of the maxillary complete denture

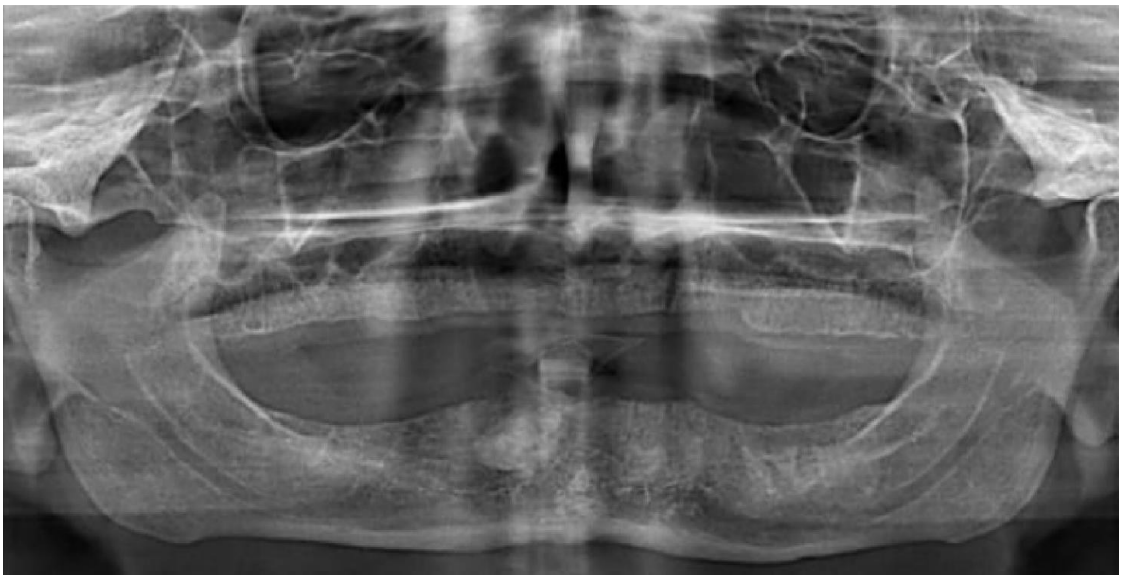

Figure 9. Initial panoramic radiograph of the patient

Figure 10. Initial intraoral photograph

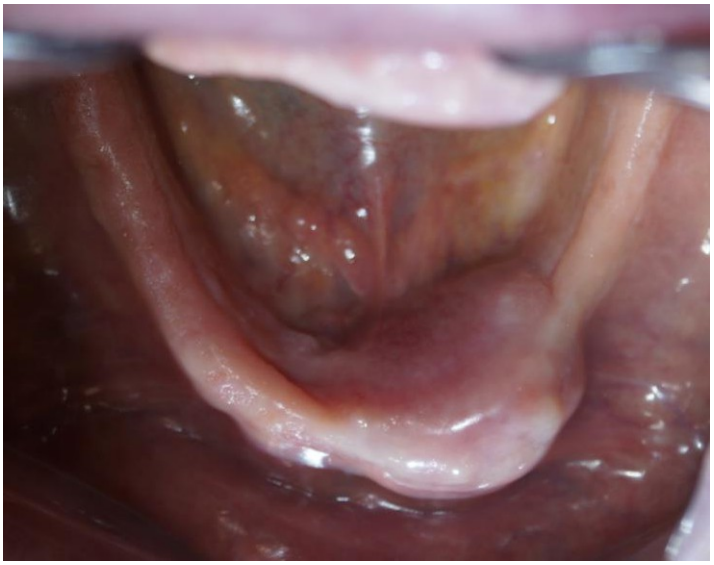

Figure 11. Initial intraoral photograph

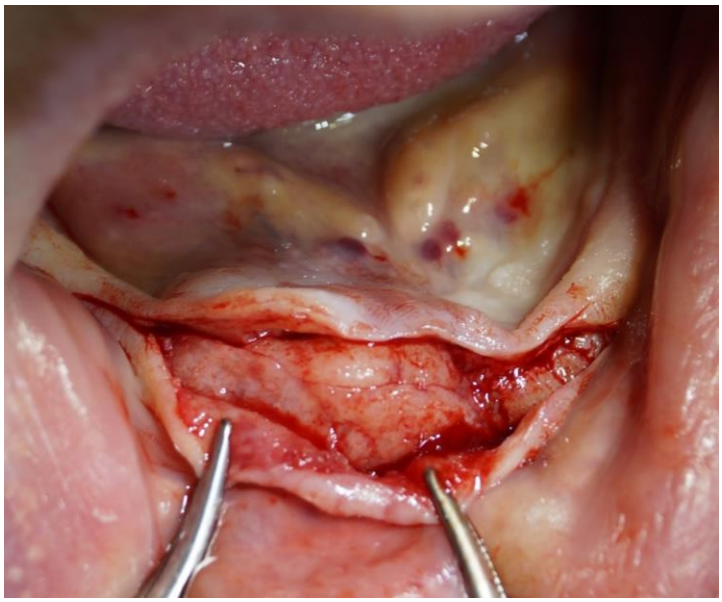

Figure 12. Intraoperative view

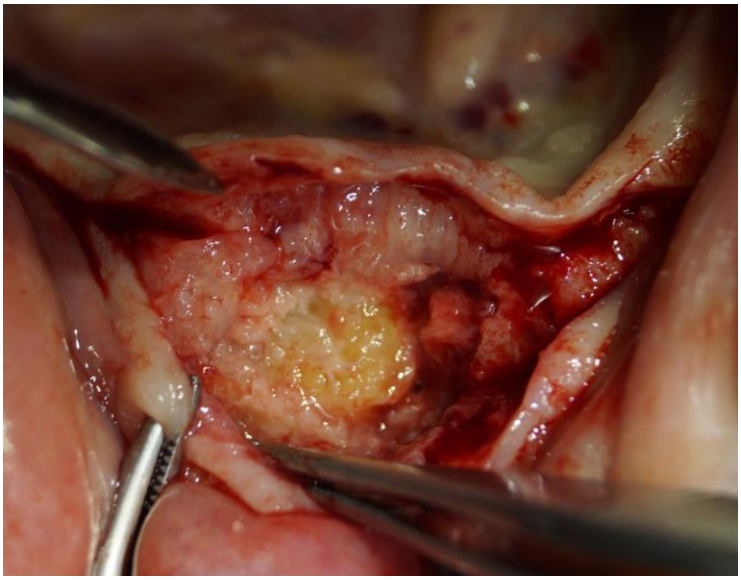

Figure 13. Intraoperative view

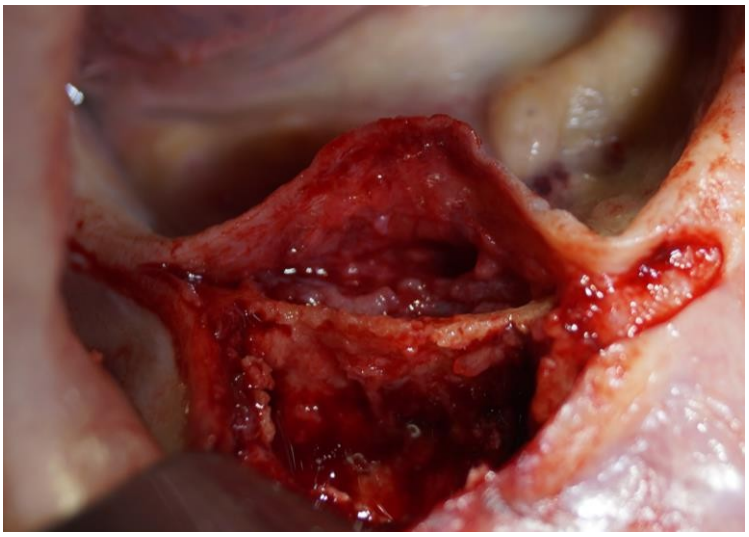

Figure 14. Intraoperative view

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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ADJUVANT TREATMENT MODALITIES IN ODONTOGENIC KERATOCYSTS: TWO CASE REPORTS AND LITERATURE REVIEW

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Abstract

Objective: To evaluate the efficacy of adjuvant treatment modalities in Odontogenic Keratocysts (OKCs) combined with surgical intervention and to analyze post-surgical recurrence rates.

Materials and Methods: This systematic review was designed based on a predefined Patient, Intervention, Comparison, and Outcome (PICO) framework including histopathologically confirmed OKC cases. PubMed, Web of Science, and Google Scholar were searched for studies published between January 2010 and January 2026. Of 388 retrieved studies, 27 met the inclusion criteria and were included in the analysis. Methodological quality was assessed using RoB 2 and the Newcastle-Ottawa Scale. Two cases were included in the presentation. Enucleation followed by application of Carnoy's solution was performed in a systemically healthy 53-year-old male patient, whereas treatment was restricted to enucleation alone in a 14-year-old patient to avoid neural damage.

Results: Histopathological examination confirmed parakeratinized odontogenic keratocyst in both presented cases. Across the included studies, enucleation alone showed the highest recurrence rates, reaching up to 63.1%, followed by modified Carnoy's solution, with a median recurrence rate of 23.68% and figures ranging from 9.5% to 66.6%. Original Carnoy's solution reduced recurrence rates to between 8.2% and 22.4%, while 5-fluorouracil demonstrated the lowest rates, with several cohorts reporting 0% recurrence over follow-up periods of 1 to 5 years. Cryotherapy showed comparable outcomes, with recurrence rates between 11.5% and 14.5%.

Conclusion: Adjuvant therapies are considered to reduce OKC recurrence rates compared to enucleation alone. However, short follow-up periods, small sample sizes, and inadequate cyst subtype reporting limit the generalizability of findings. Parakeratinized odontogenic keratocysts have a higher recurrence risk, making subtype differentiation clinically important.

Key Words: Odontogenic keratocyst, Adjuvant therapy, Recurrence rate

1. Introduction

Odontogenic keratocysts (OKCs) are developmental cysts arising from dental lamina remnants (1). These lesions possess a thin epithelial lining displaying parakeratinization or orthokeratinization. Parakeratinized variants account for 80% to 90% of cases and exhibit a strong recurrence risk (2). The aggressive biological behavior of OKCs includes high cell proliferation (3). This behavior is highlighted by increased expression of Ki-67 in the basal and parabasal layers. Apoptosis inhibition via Bcl-2 and cell cycle alteration via p53 also contribute to this aggressive profile (4). First described by Philipsen in 1956, the entity was reclassified by the World Health Organization (WHO) as a Keratocystic Odontogenic Tumor (KCOT) in 2005 due to its aggressive nature (5). The WHO reverted the classification back to an odontogenic cyst in 2017 because evidence supporting a true neoplastic origin was insufficient. Multiple lesions may occur simultaneously or sequentially in patients with Gorlin-Goltz syndrome, a genetic condition linked to PTCH1 mutations (6).

Surgical enucleation alone results in high recurrence rates ranging from 14.8% to 63.1% (1). This clinical problem necessitates the application of chemical or thermal adjuvants to devitalize remaining epithelial cells. Standard chemical solutions include Carnoy's solution (CS) and Modified Carnoy's solution (MCS). Carnoy's Solution (CS) contains 60% absolute ethanol, 30% chloroform, 10% glacial acetic acid, and 1 g of ferric chloride. It functions as a chemical tissue fixative and penetrates bone to a depth of approximately 1.5 mm (7). In 2013, the United States Food and Drug Administration (FDA) banned chloroform due to its systemic chemical toxicity. MCS was subsequently developed by removing chloroform from the mixture.

Topical 5-Fluorouracil (5-FU) represents a targeted biological alternative. Originally indicated as a systemic antimetabolite chemotherapy agent for colorectal and breast malignancies, 5-FU blocks DNA synthesis by inhibiting the thymidylate synthase enzyme (8). In maxillofacial applications, a 5% 5-FU topical cream is placed into the bony defect on sterile strip gauze for 24 hours to selectively destroy rapid epithelial cells without causing damage to post-mitotic nerve fibers (9). Other contemporary adjunct options include cryotherapy with liquid nitrogen (-196°C) and diode laser ablation.

To systematically evaluate the performance of these intervention methods, a clear clinical framework was established using the Patient, Intervention, Comparison, and Outcome (PICO) approach, as outlined below.

Patient (P): Patients diagnosed with histopathologically confirmed parakeratinized or orthokeratinized odontogenic keratocysts, including syndromic (Gorlin-Goltz syndrome) and non-syndromic presentations.

Intervention (I): Surgical enucleation combined with adjunctive therapies, specifically original Carnoy's solution, modified Carnoy's solution, topical 5-Fluorouracil, cryotherapy, or diode laser ablation.

Comparison (C): Conventional surgical enucleation performed alone without any chemical or thermal adjunctive modalities.

Outcome (O): Postoperative recurrence rates and neurosensory or surgical complications recorded during the follow-up period.

2. Materials and Methods

To evaluate the clinical performance of these treatments, a literature search was conducted in PubMed, Web of Science, and Google Scholar for studies published between January 2010 and January 2026. The search identified 388 records, of which 37 remained after title/abstract and study-design screening; following removal of 10 duplicates, 27 studies met the final inclusion criteria. Eligible studies were required to be original clinical trials or observational studies published in full text in English, involving histopathologically confirmed cases of odontogenic keratocysts with a minimum postoperative follow-up of 12 months. Surgical enucleation performed either alone or combined with an adjuvant modality, including original Carnoy's solution, modified Carnoy's solution, topical 5-fluorouracil, cryotherapy, or diode laser ablation, was also required as the surgical approach. Methodological quality and risk of bias for the included investigations were systematically appraised using the Risk of Bias 2 (RoB 2) tool for randomized trials and the Newcastle-Ottawa Scale (NOS) for non-randomized observational studies. The study identification, screening, eligibility, and inclusion process is summarized in the PRISMA flow diagram (Figure 8).

Case 1

A systemically healthy 53-year-old male patient was evaluated at oral and maxillofacial surgery clinic. The jaw lesion was detected during a routine dental and radiographic examination, measuring approximately 5.2 cm × 1.8 cm, and extended in an anteroposterior direction across the right mandible, involving teeth 32, 31, 41, 42, 43, and 44. The patient was asymptomatic and reported no pain or sensory alterations. Radiographic findings were assessed using panoramic radiography. The radiograph revealed a large, well-defined, unilocular radiolucent lesion (Figure 1). Visual and physical inspection revealed no intraoral swelling (Figure 2a). The overlying oral mucosa was intact and clinically healthy. Vitality testing of the adjacent teeth in the region was positive.

The lesion was located in the posterior mandible, starting from the anterior zone and extending into the posterior body and ramus. This matched the most common anatomical site for OKCs.

Surgical intervention was planned under local anesthesia. A full-thickness mucoperiosteal flap was elevated to expose the bone. Two separate cortical bone windows were created to access the cystic cavities safely (Figure 2b). The cystic lining was separated from the bone walls and enucleated completely (Figure 3a). CS was applied for 3 minutes inside the residual bone cavity using sterile gauze pledgets to target micro-cysts (Figure 3b). The cavity was irrigated thoroughly with sterile saline afterward to remove chemical residue. The mucoperiosteal flap was repositioned and closed primarily with sutures. The enucleated specimen was sent for histopathological analysis. Microscopic evaluation confirmed a parakeratinized OKC subtype.

Case 2

A 14-year-old male patient presented to our clinic for evaluation. The patient was asymptomatic, and the lesions were detected incidentally during a routine evaluation. On extraoral examination, no facial asymmetry or swelling was noted. Intraoral examination revealed no swelling, and the overlying oral mucosa was intact and healthy. Radiographic findings were assessed using panoramic radiography, which revealed multiple radiolucent lesions involving all four quadrants of the jaws (Figure 4). Radiographic measurements showed that the lesions in the right mandibular and maxillary regions measured approximately 2.8 × 2.1 cm and 5.9 × 3.0 cm, respectively. Based on the patient's personal history and clinical presentation, the findings were considered compatible with

Gorlin-Goltz syndrome. Surgical intervention was planned under local anesthesia. A full-thickness mucoperiosteal flap was elevated to gain access (Figure 5a). A specific cystic window was opened over the bone to expose the lesion (Figure 5b). Upon perforation of the thick cyst wall, direct drainage of the internal cystic content was observed. Due to the young age of the patient and the high anatomical risk of causing permanent neurosensory injury to the inferior alveolar nerve, the surgical approach was restricted to enucleation alone without using chemical cauterization or any chemical adjuvant. The cystic lesion was enucleated completely in a single piece in continuity with an associated impacted third molar tooth from the bone walls (Figure 6). The surgical cavity was irrigated thoroughly with sterile saline. The excised specimen including the single impacted tooth was submitted for microscopic analysis (Figure 7a). The mucoperiosteal flap was repositioned and closed primarily with sutures (Figure 7b). Histopathological examination confirmed the diagnosis of a parakeratinized OKC subtype.

3. Discussion

The surgical management of OKCs depends on cyst size and patient age, medical history, and anatomical considerations. Conservative enucleation alone remains restricted to small (<2-3 cm) unilocular lesions. Larger lesions (>3 cm) frequently require marsupialization or decompression to decrease the lesion size and protect anatomical structures before secondary enucleation (10, 11). Aggressive options like peripheral osteotomy provide mechanical cleansing, while radical resection is reserved for extensive, multi-focal, or recurrent presentations.

The reviewed studies indicate that enucleation alone is associated with recurrence rates as high as 63.1% (12, 13, 14). Applying original CS reduces these rates significantly to a range between 8.2% and 22.4% (13, 15). Long-term cohorts confirm this success, with an 11.4% recurrence rate reported over 7.2 years (16), and 14.3% observed over 4.5 years (17).

MCS is associated with higher and less predictable recurrence rates, likely due to the absence of chloroform. A meta-analysis involving 114 patients treated with MCS showed a median recurrence rate of 23.68% over 4 years (18). Single-center studies report similar findings, with recurrence rates of 25% over 27 months (19), and a 66.6% recurrence rate over 3 to 7 years (20). Only one study reported a lower rate of 9.5% at a limited 1-year follow-up (21) (Table 1).

Topical 5-FU application demonstrates the lowest recurrence rates across current literature. Multiple clinical cohorts reported 0% recurrence rates using 5-FU, with follow-up periods of 5 years (18), 22 months (19), 1 year (21), 2 to 4 years (20), and 35 months (22) (Table 2). Unlike CS, 5-FU avoids neurotoxic injury because it does not affect post-mitotic nerve tissues. Thermal and mechanical alternatives show mixed results. Cryotherapy using liquid nitrogen has recurrence rates between 11.5% at 3.5 years (23) and 14.5% in a meta-analysis (24), but carries risks of bone osteosclerosis and nerve paresthesia. Laser ablation with a 940 nm diode laser combined with 5-FU can prevent recurrence for up to 12 years, but clinical numbers are limited (25).

The methodological quality of the 27 included studies was assessed using tools appropriate to each study design. The three randomized controlled trials were evaluated with the Cochrane Risk of Bias 2 tool. One trial was rated as low risk, and the remaining two were rated as having some concerns. The fifteen cohort studies

were appraised using the Newcastle-Ottawa Scale, with scores ranging from four to eight out of nine. Of these, five were classified as low risk and ten as moderate risk of bias. The nine case reports and case series were evaluated with the Joanna Briggs Institute critical appraisal checklist, and all were judged to be of good quality (Table 3). No study in the review was rated as high risk of bias, and most fell into the low or moderate risk categories. These results indicate that the overall quality of the included evidence is acceptable. Nevertheless, the small number of randomized trials and the frequent lack of adjustment for confounding variables in the cohort studies, which lowered their comparability scores, should be taken into account when interpreting the findings of this review.

Several limitations remain in the current evidence on OKCs. Many studies do not distinguish between parakeratinized and orthokeratinized lesions, despite their different recurrence risks. Combining these subtypes may overestimate the effectiveness of newer adjuvant therapies because orthokeratinized cysts have a lower baseline risk of recurrence. In addition, follow-up periods for studies evaluating 5-FU and laser therapy are generally limited to 1-2 years, although recurrences often occur 5-10 years after surgery. Evidence for newer treatment protocols is also limited by small sample sizes, and the extent of bone penetration achieved by topical 5-FU has not yet been established.

4. Conclusion

The choice of adjuvant treatment should be guided by lesion location, patient age, and the presence of syndromic disease such as Gorlin-Goltz syndrome. Original Carnoy's solution remains effective for local control, but its neurotoxic potential limits its use in anatomically sensitive regions. Topical 5-FU, in contrast, achieved comparable or superior recurrence control without nerve-related complications in the studies reviewed, making it a reasonable alternative in younger patients or lesions adjacent to critical neurovascular structures. Prospective studies with longer follow-up are required to validate these findings, as current evidence is limited by short follow-up periods and inconsistent histological subtype reporting.

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6. Figure Legends

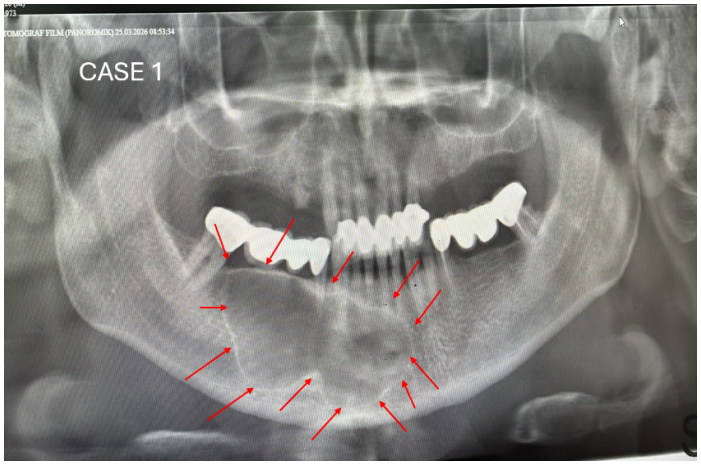


Figure 1: Preoperative panoramic radiograph demonstrating a well-defined, unilocular radiolucent lesion in the mandible; the adjacent teeth tested vital.

Figure 2: (a) Preoperative intraoral photograph showing intact overlying mucosa;

(b) intraoperative view after mucoperiosteal flap elevation, showing the double bone window created to access the lesion.

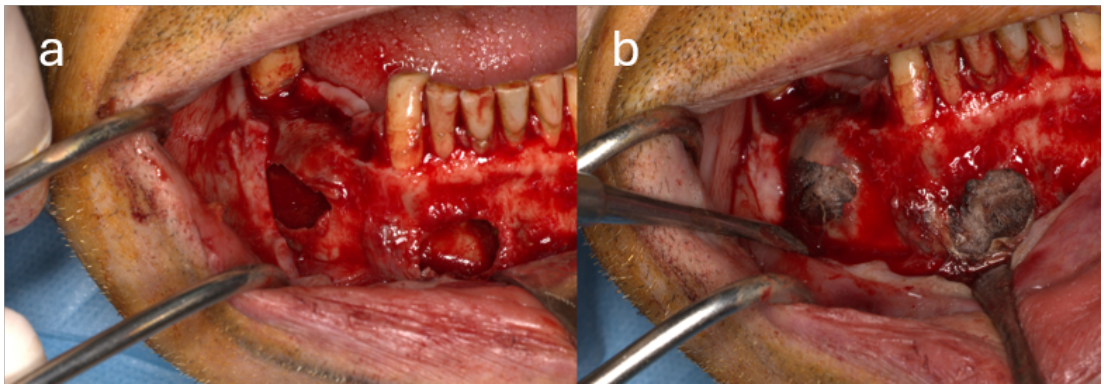


Figure 3: (a) Enucleation of the lesion and (b) application of Carnoy's solution to the bony cavity via sterile gauze pledgets.

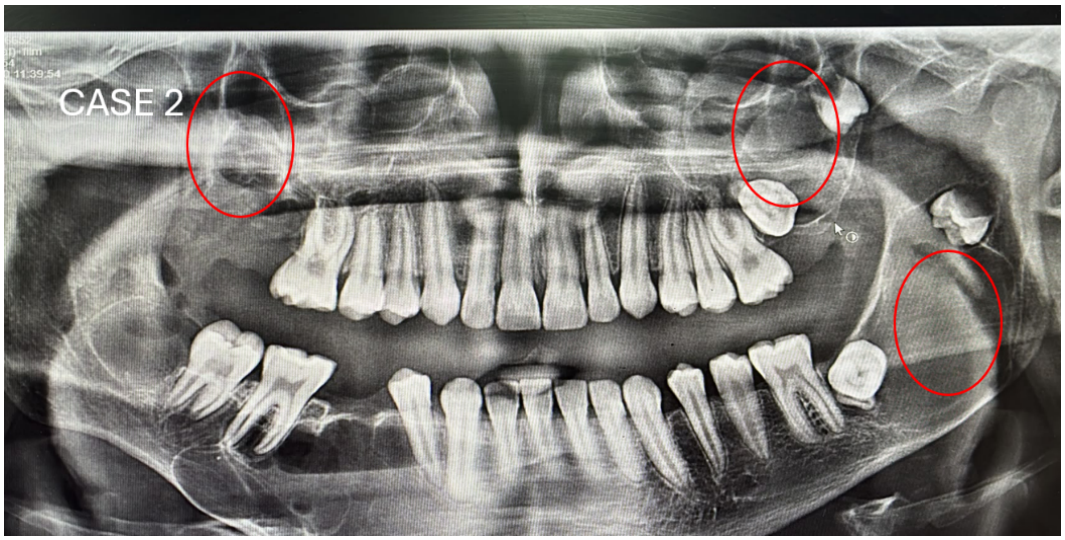


Figure 4: Preoperative panoramic radiograph in a patient with Gorlin-Goltz syndrome, showing multiple radiolucent lesions involving all four quadrants.

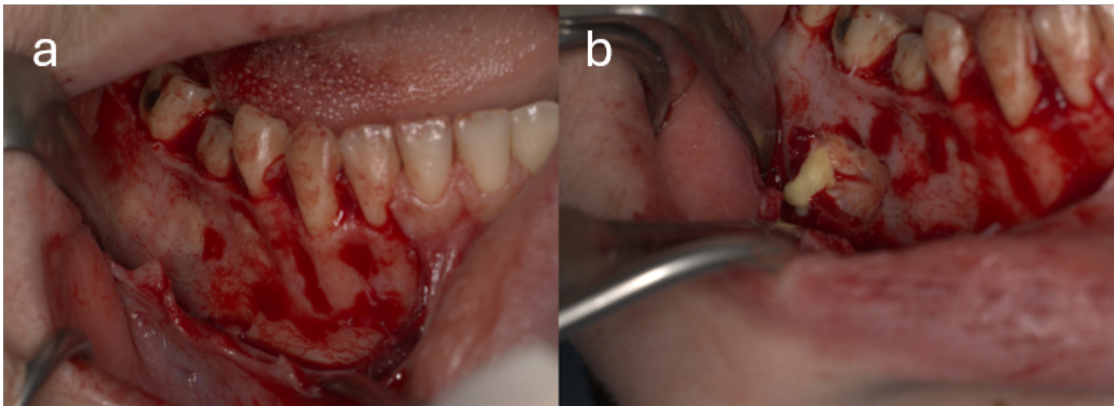


Figure 5: (a) Intraoperative photograph after mucoperiosteal flap elevation, (b) showing the cystic window created over the lesion.

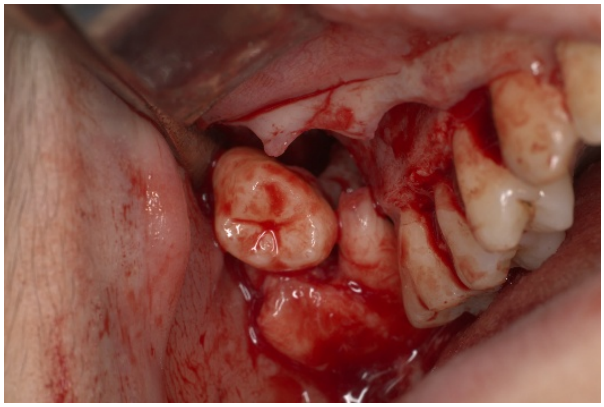


Figure 6: Intraoperative photograph showing enucleation of the lesion in continuity with an associated impacted tooth in maxilla.

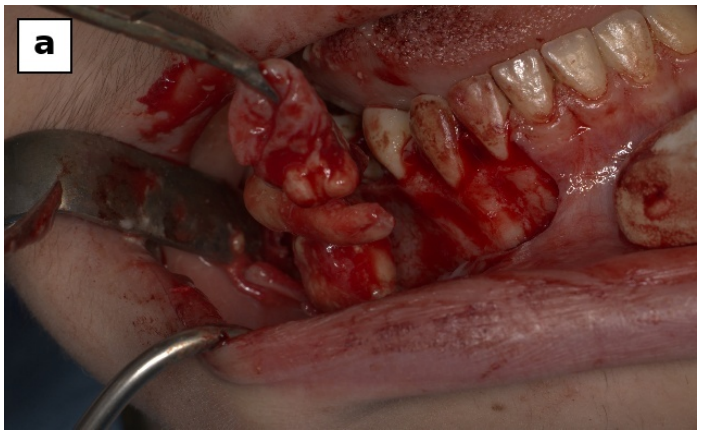
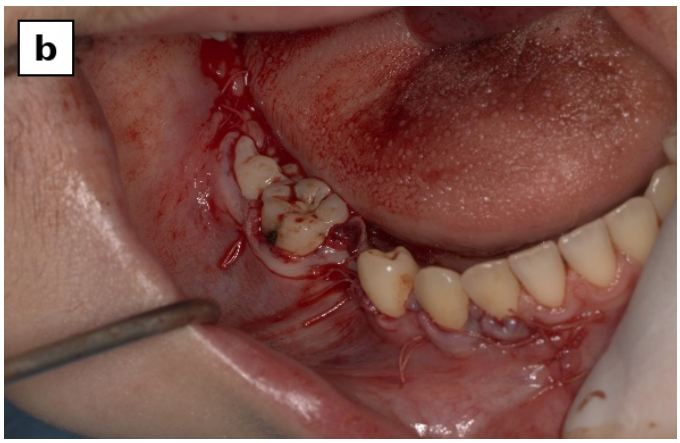


Figure 7: (a) Excised specimen comprising the cystic lesion together with the impacted tooth in mandibula;



(b) immediate postoperative view after primary closure of the mucoperiosteal flap.

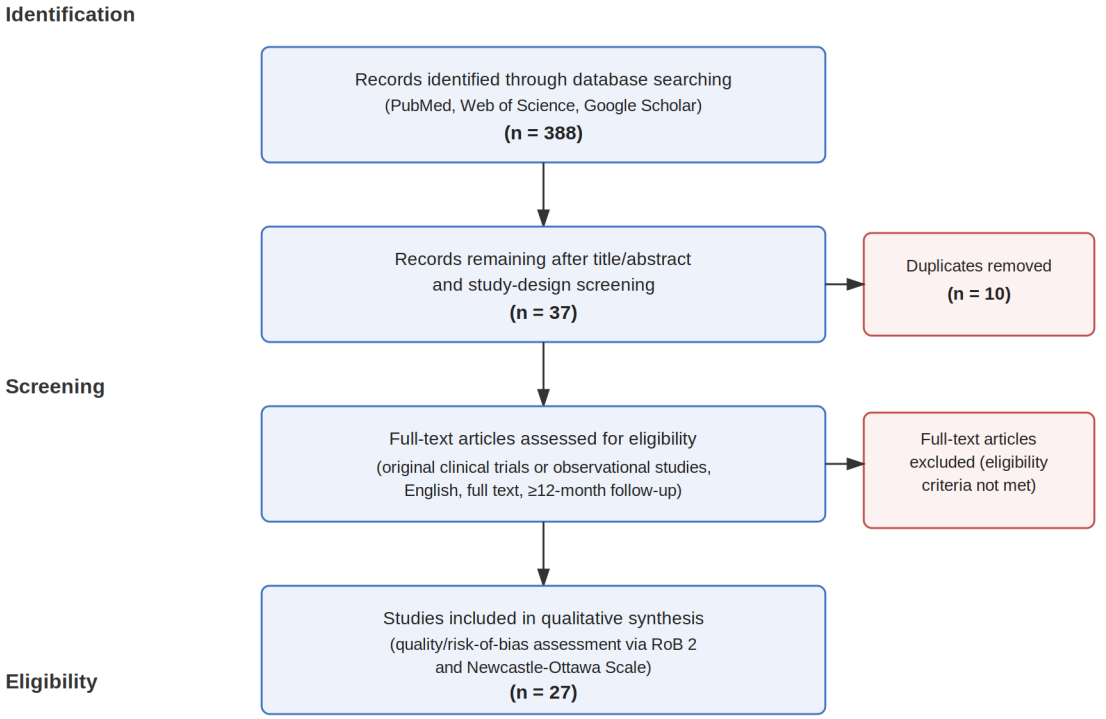


Figure 8: PRISMA flow diagram illustrating the study identification, screening, eligibility, and inclusion process.

Figure 8: PRISMA flow diagram illustrating the study identification, screening, eligibility, and inclusion process.

7. Tables

Table 1: Recurrence rates reported with Modified Carnoy's Solution (MCS) and original Carnoy's Solution (CS) following enucleation of odontogenic keratocysts.

Study	Sample Size	Recurrence	Follow-up
Jacobs et al. (2024) (Meta-analysis - MCS)	114 patients	23.68%	4 years (Median)
Leung et al. (2016) (Original CS)	105 patients	11.4%	7.2 years (Mean)
Caminiti et al. (2021) (MCS)	36 patients	25%	27 months (Median)
Wanve et al. (2023) (MCS)	21 patients	9.5%	1 year
Ledderhof et al. (2016) (MCS)	21 patients	19%	41.3 months
Gosau et al. (2010) (Original CS)	14 patients	14.3%	4.5 years (Median)
Lone et al. (2020) (MCS)	9 patients	66.6%	3-7 years

CS: Carnoy's Solution; MCS: Modified Carnoy's Solution.

Table 2: Recurrence rates reported with topical 5-fluorouracil (5-FU) application following enucleation of odontogenic keratocysts.

Study	Sample Size	Recurrence	Follow-up
Jacobs et al. (2024) (Meta-analysis)	99 patients	0%	5 years (Median)
Caminiti et al. (2021)	34 patients	0%	22 months (Median)
Wanve et al. (2023)	21 patients	0%	1 year
Lone et al. (2020)	11 patients	0%	2-4 years
Ledderhof et al. (2016)	11 patients	0%	35 months

5-FU: 5-Fluorouracil.

Table 3: Quality assessment of included studies (n = 27).

#	Study	Design	Tool	Score/Domain	Overall Risk
1	Ledderhof 2017	Ambispective cohort	NOS	7/9	Low risk of bias
2	Sivanmalai 2012	Case report	JBI	-	Good quality

#	Study	Design	Tool	Score/Domain	Overall Risk
3	Dashow 2015	Retrospective cohort	NOS	8/9	Low risk of bias
4	Khan 2019	Case report	JBI	-	Good quality
5	Wanve 2023	RCT	RoB 2	-	Some concerns
6	Petchiammal 2024	Case series	JBI	-	Good quality
7	Ribeiro 2017	Retrospective cohort	NOS	6/9	Moderate risk of bias
8	Berberi 2021	Case report	JBI	-	Good quality
9	Lone 2020	Prospective cohort	NOS	5/9	Moderate risk of bias
10	Janas-Naze 2023	Retrospective cohort	NOS	8/9	Low risk of bias
11	Stanbouly 2022	Retrospective (pooled) cohort	NOS	4/9	Moderate risk of bias
12	Jeong 2025	Retrospective cohort	NOS	6/9	Moderate risk of bias
13	Borrás-Ferreres 2024	Case report	JBI	-	Good quality
14	Abdelfadil 2025	Case report	JBI	-	Good quality
15	Caminiti 2021	Retrospective cohort	NOS	7/9	Low risk of bias
16	Urs 2024	Retrospective cohort	NOS	4/9	Moderate risk of bias
17	Alwakeel 2023	Case report	JBI	-	Good quality
18	Jeon 2023	Case report	JBI	-	Good quality
19	Bera 2024	Retrospective cohort	NOS	4/9	Moderate risk of bias
20	Ayu 2023	Rapid review	N/A	-	Not applicable (narrative/rapid review)
21	Semi 2010	Case report	JBI	-	Good quality
22	Kebede 2016	Case report	JBI	-	Good quality

#	Study	Design	Tool	Score/Domain	Overall Risk
23	Karaca 2018	Retrospective cohort	NOS	6/9	Moderate risk of bias
24	Leung 2016	Retrospective cohort	NOS	6/9	Moderate risk of bias
25	Sinha 2025	RCT	RoB 2	-	Some concerns
26	Jung 2021	Retrospective cohort	NOS	6/9	Moderate risk of bias
27	Gosau 2010	Retrospective cohort	NOS	6/9	Moderate risk of bias

Abbreviations: NOS, Newcastle-Ottawa Scale (maximum score 9 stars); JBI, Joanna Briggs Institute Critical Appraisal Checklist; RoB 2, Cochrane Risk-of-Bias tool for randomized controlled trials; RCT, randomized controlled trial; 5-FU, 5-fluorouracil; CS, Carnoy's solution.

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
33. ULUSLARARASI BİLİMSEL KONGRESİ
16-18 Haziran 2026, Grand Cevahir Hotel - İstanbul

SS-131

Oral ve Maksillofasiyal Rekonstrüksiyonlarda Kök Hücre Kullanımı: Güncel Yaklaşımlar Literatür Derlemesi

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1. GİRİŞ

Maksillofasiyal defektler; konjenital anomaliler, travma, enfeksiyonlar, tümör rezeksiyonları ve dejeneratif hastalıklar sonucu ortaya çıkabilmekte, fonksiyonel ve estetik açıdan önemli kayıplara neden olabilmektedir. Bu defektlerin rekonstrüksiyonu, yalnızca anatomik bütünlüğün yeniden sağlanmasını değil, aynı zamanda doku fonksiyonunun ve uzun dönem stabilitenin yeniden kazandırılmasını gerektirdiğinden oral ve maksillofasiyal cerrahinin en karmaşık tedavi alanlarından birini oluşturmaktadır (1,2).

Otolog kemik greftleri günümüzde altın standart tedavi seçeneği olarak kabul edilse de donör saha morbiditesi, greft rezorpsiyonu ve öngörülemeyen klinik sonuçlar gibi önemli dezavantajlara sahiptir. Benzer şekilde, mevcut biyomalzemeler ve yönlendirilmiş doku/kemik rejenerasyonu teknikleri, doğal dokuların biyolojik ve fonksiyonel özelliklerini tam olarak taklit etmekte yetersiz kalmaktadır (3,4). Bu durum, kemik, periodontal ligament, sement ve oral mukozanın koordineli rejenerasyonunu gerektiren kraniyofasiyal bölgede daha belirgin hale gelmektedir (5).

Kök hücre temelli rejeneratif yaklaşımlar, kendini yenileme ve çoklu hücre soylarına farklılaşma kapasitelerinin yanı sıra, salgıladıkları büyüme faktörleri, sitokinler ve ekstraselüler veziküller aracılığıyla doku iyileşmesini düzenleyebilmeleri nedeniyle son yıllarda önemli ilgi görmüştür (6,7). Kemik iliği, yağ dokusu ve dental dokular kaynaklı mezenkimal kök hücreler; kemik ve yumuşak doku rejenerasyonu, temporomandibular eklem onarımı ve kraniyofasiyal doku mühendisliği uygulamalarında umut verici sonuçlar ortaya

koymuştur (8). Ayrıca biyomalzemeler, iskele sistemleri, büyüme faktörü taşıyıcıları ve üç boyutlu biyobaskı teknolojilerindeki gelişmeler, kök hücre temelli tedavilerin klinik uygulanabilirliğini önemli ölçüde artırmıştır (9).

Bu derlemenin amacı, kök hücrelerin biyolojik özelliklerini ve etki mekanizmalarını özetlemek, oral ve maksillofasiyal rekonstrüksiyondaki güncel uygulamalarını değerlendirmek ve klinik translasyon sürecindeki mevcut zorluklar ile gelecekteki perspektifleri tartışmaktır.

2. KÖK HÜCRE BİYOLOJİSİ VE SINIFLANDIRILMASI

Kök hücreler, kendini yenileme ve farklı hücre tiplerine dönüşebilme kapasitesine sahip farklılaşmamış hücrelerdir (10). Bu özellikleri sayesinde doku gelişimi, homeostazı ve onarımında önemli rol oynarlar (9,10). Kök hücreler, farklılaşma potansiyellerine ve köken aldıkları dokuya göre sınıflandırılmaktadır (11).

Kök hücreler temel olarak embriyonik ve erişkin kök hücreler olmak üzere iki gruba ayrılır. Embriyonik kök hücreler pluripotent özellik göstererek vücuttaki hemen hemen tüm hücre tiplerine farklılaşabilirken, etik kaygılar ve tümör oluşumu riski nedeniyle klinik kullanımları sınırlıdır (12,13). Erişkin kök hücreler ise daha sınırlı farklılaşma kapasitesine sahip olmakla birlikte doku yenilenmesi ve onarımında görev alırlar (14).

Erişkin kök hücrelerin önemli bir alt grubunu oluşturan mezenkimal kök hücreler (MSC'ler), osteoblast, kondrosit ve adiposit gibi farklı hücre tiplerine dönüşebilme yeteneklerinin yanı sıra immünomodülatör ve rejeneratif özellikleri nedeniyle rejeneratif tıp alanında en yaygın araştırılan kök hücre popülasyonlarından biridir (12,15).

3. ORAL VE MAKSİLLOFASİYAL REKONSTRÜKSİYONDA KÖK HÜCRE KAYNAKLARI

Oral ve maksillofasiyal rekonstrüksiyonda kullanılan kök hücrelerin büyük çoğunluğunu mezenkimal kök hücreler (MSC'ler) oluşturmaktadır. Kemik iliği, yağ dokusu ve dental dokular kaynaklı MSC'ler; yüksek rejeneratif kapasiteleri, immünomodülatör özellikleri ve çeşitli hücre tiplerine farklılaşabilmeleri nedeniyle kraniyofasiyal doku mühendisliğinde
yaygın olarak araştırılmaktadır (10,12,16).

3.1. Kemik İliği Kaynaklı Mezenkimal Kök Hücreler (BM-MSCs)

BM-MSC'ler, güçlü osteojenik potansiyelleri nedeniyle kemik rejenerasyonu alanında en kapsamlı araştırılan kök hücre grubudur. Maksillofasiyal kemik defektlerinin onarımı, sinüs augmentasyonu, alveolar kret rekonstrüksiyonu ve implant osseointegrasyonunun desteklenmesinde başarılı sonuçlar göstermiştir. Ancak elde edilmelerinin invaziv olması ve yaşla birlikte hücresel kapasitenin azalması klinik kullanımlarını sınırlandırmaktadır (17-20).

3.2. Yağ Dokusu Kaynaklı Mezenkimal Kök Hücreler (ADSCs)

ADSC'ler minimal invaziv yöntemlerle yüksek miktarda elde edilebilmeleri ve yüksek proliferasyon kapasiteleri nedeniyle BM-MSC'lere önemli bir alternatif olarak kabul edilmektedir (21). Osteojenik ve kondrojenik farklılaşma yeteneklerinin yanı sıra
anjiyogenezi ve doku iyileşmesini destekleyen büyüme faktörleri salgılarlar. Bu özellikleri sayesinde sert ve yumuşak doku rejenerasyonunda yaygın olarak kullanılmaktadırlar (22–24).

3.3. Dental Kaynaklı Mezenkimal Kök Hücreler (DSCs)

Dental dokular, kolay erişilebilir olmaları ve düşük donör saha morbiditesi nedeniyle önemli bir MSC kaynağıdır. Dental pulpa kök hücreleri (DPSC), periodontal ligament kök hücreleri
(PDLSC), süt dişi kaynaklı kök hücreler (SHED), dental follikül kök hücreleri (DFSC), apikal papilla kök hücreleri (SCAP), gingiva kaynaklı mezenkimal kök hücreler (GMSC) ve alveoler kemik kaynaklı mezenkimal kök hücreler (ABMSC) bu grubun başlıca üyeleridir (25). Bu
hücreler yüksek proliferasyon kapasiteleri, çok yönlü farklılaşma potansiyelleri ve immünomodülatör özellikleri sayesinde kemik, periodontal doku ve pulpa-dentin kompleksinin rejenerasyonunda umut verici sonuçlar göstermiştir (25,26).
DPSC'ler nörojenik ve anjiyojenik özellikleriyle pulpa rejenerasyonunda öne çıkarken (27,28), PDLSC'ler periodontal ligament ve sement rejenerasyonunda önemli rol
oynamaktadır (29,30). SHED ve SCAP hücreleri yüksek proliferatif kapasiteleri nedeniyle rejeneratif endodonti uygulamalarında dikkat çekmektedir (31-34). DFSC'ler ve ABMSC'ler

güçlü osteojenik potansiyelleriyle kemik rejenerasyonunda umut vadederken (35,36), GMSC'ler kolay elde edilebilmeleri ve belirgin immünomodülatör etkileri sayesinde doku mühendisliği uygulamalarında giderek daha fazla ilgi görmektedir (37).

4. KÖK HÜCRE TEMELLİ REJENERASYONLARDA İSKELE SİSTEMLERİ

İskele sistemleri, kök hücrelerin adezyonunu, proliferasyonunu, göçünü ve farklılaşmasını destekleyen üç boyutlu bir mikroçevre sağlayarak doku mühendisliğinde kritik bir rol oynamaktadır (38,39). Kök hücrelerin rejeneratif etkinliği büyük ölçüde bulundukları mikroçevreye bağlı olduğundan, iskeleler yalnızca yapısal destek sağlamakla kalmayıp hücresel davranışları ve doku oluşumunu yönlendiren biyolojik platformlar olarak da görev yapmaktadır (40).

İdeal bir iskele; biyouyumlu, kontrollü olarak biyobozunabilir, yeterli mekanik dayanıklılığa sahip ve neovaskülarizasyonu destekleyebilen özellikler taşımalıdır. Ayrıca yüzey özellikleri, porozite ve degradasyon profili gibi parametreler hücre tutunması, besin difüzyonu ve yeni doku oluşumu üzerinde doğrudan etkilidir (38,40).

İskele sistemleri aynı zamanda kök hücreler ve büyüme faktörleri için taşıyıcı görevi görerek BMP, PDGF ve VEGF gibi biyolojik sinyallerin kontrollü salınımını sağlar. Bu özellikleri sayesinde hücre göçü, anjiyogenez ve doku maturasyonunu destekleyerek oral ve maksillofasiyal rekonstrüksiyonda rejeneratif sürece katkıda bulunurlar (41,42).

Kraniyofasiyal doku mühendisliğinde kollajen ve fibrin gibi doğal biyomalzemelerin yanı sıra polikaprolakton (PCL) ve poli(laktik-ko-glikolik asit) (PLGA) gibi sentetik polimerler yaygın olarak kullanılmaktadır. Ayrıca hidroksiapatit (HA) ve β-trikalsiyum fosfat (β-TCP) gibi kalsiyum fosfat bazlı biyomalzemeler, osteokondüktif özellikleri nedeniyle kemik rejenerasyonunda önemli bir yere sahiptir (43,44).

Son yıllarda üç boyutlu baskı teknolojilerindeki gelişmeler, kontrollü porozite ve mimariye sahip hasta-spesifik iskelelerin geliştirilmesine olanak sağlamış, böylece kök hücre temelli tedavilerin oral ve maksillofasiyal rekonstrüksiyondaki klinik potansiyelini artırmıştır (45).

5. ORAL VE MAKSİLLOFASİYAL REKONSTRÜKSİYONLARDA KÖK HÜCRE KULLANIMI

Kök hücre temelli tedaviler, oral ve maksillofasiyal dokuların rejenerasyonu ve rekonstrüksiyonunda umut verici sonuçlar ortaya koymuştur. Mevcut çalışmalar, bu yaklaşımların kemik ve yumuşak doku iyileşmesini destekleyerek geleneksel tedavi yöntemlerinin sınırlılıklarını azaltabileceğini göstermektedir.

5.1. Kemik Rejenerasyonu

Kök hücreler; alveoler kemik rejenerasyonu, sinüs augmentasyonu, alveoler yarık onarımı ve kraniyofasiyal kemik defektlerinin tedavisinde yaygın olarak araştırılmıştır. Klinik ve radyolojik çalışmalar, kök hücre destekli greftlerin yeni kemik oluşumunu, vaskülarizasyonu ve greft stabilitesini artırabildiğini göstermektedir. Özellikle MSC'lerin BMAC, büyüme faktörleri ve osteokondüktif biyomalzemelerle kombinasyonu, kemik maturasyonunu ve rejeneratif sonuçları iyileştirebilmektedir (46-48).

5.2. Yumuşak Doku ve Periodontal Rejenerasyon

Kök hücre temelli yaklaşımlar, periodontal ligament, sement, alveoler kemik ve gingival dokuların rejenerasyonunu destekleyerek periodontal tedavilerde önemli bir potansiyel sunmaktadır. Özellikle dental kaynaklı mezenkimal kök hücrelerin kullanıldığı çalışmalarda periodontal ataşman kazanımı, yeni kemik ve sement oluşumu ile daha etkili doku iyileşmesi bildirilmiştir. Ayrıca hücre tabakası teknolojileri, biyomalzeme destekli sistemler ve kök hücre kaynaklı eksozomlar, periodontal ve yumuşak doku rejenerasyonunda umut verici sonuçlar göstermektedir (49-51).

5.3. Temporomandibular Eklem Rejenerasyonu

Temporomandibular eklemin kompleks yapısı ve sınırlı rejenerasyon kapasitesi nedeniyle rekonstrüksiyonu önemli bir klinik zorluktur. MSC'ler, biyomalzemeler ve biyolojik sinyaller ile birlikte kullanıldığında kıkırdak ve kemik rejenerasyonunu destekleyebilmekte, inflamasyonu azaltabilmekte ve eklem fonksiyonlarını iyileştirebilmektedir. Ancak mevcut klinik kanıtlar sınırlı olup, uzun dönem sonuçları değerlendiren çalışmalara ihtiyaç vardır (52-54).

5.4. Sinir Rejenerasyonu

MSC'ler ve özellikle dental pulpa kök hücreleri (DPSC'ler), salgıladıkları nörotrofik faktörler aracılığıyla aksonal rejenerasyonu, miyelinizasyonu ve fonksiyonel sinir iyileşmesini destekleyebilmektedir. Deneysel çalışmalar, DPSC'lerin periferik sinir yaralanmalarında rejeneratif süreci hızlandırdığını göstermiştir (55,56).

5.5. Osteonekroz ve Osteoradyonekroz Tedavisi

Adipoz doku kaynaklı kök hücreler (ADSC'ler) ve eksozomları, anjiyogenezi artırmaları, inflamasyonu baskılamaları ve kemik iyileşmesini desteklemeleri sayesinde MRONJ ve osteoradyonekroz tedavisinde umut verici sonuçlar göstermektedir. Bu etkiler, hasarlı dokularda vaskülarizasyonun ve doku rejenerasyonunun iyileştirilmesine katkı sağlamaktadır (57,58).

5.6. Diğer Uygulamalar

Kök hücreler, rejeneratif endodontide pulpa-dentin kompleksinin yeniden oluşturulması, distraksiyon osteogenezinde kemik oluşumunun desteklenmesi ve immünomodülatör etkileriyle doku iyileşmesinin düzenlenmesi gibi alanlarda da araştırılmaktadır. Ayrıca oral kanser çalışmalarında, kanser kök hücre biyolojisinin anlaşılması ve hedefe yönelik tedavilerin geliştirilmesi açısından önemli bir araştırma konusu oluşturmaktadır (59,61).

Tablo 1: Kök hücre tekniklerinin oral cerrahi kliniğine uygulanması

Literatür	Kök hücre tipi	Kullanılan iskele/biyomateryal	Oral cerrahide kullanımı	Bulgular
Naujokat ve ark. 2022 (62)	BMAC	Kollajen membran, HA	Alveolar kret rekonstrüksiyonu	BMAC, greft stabilitesini artırmış ve ek ekipman ile teknik uygulama gerektirmesine rağmen kompleks alveoler kret rekonstrüksiyonlarında tedavi sonuçlarını iyileştirme potansiyeli göstermiştir.

Matheus ve ark. 2022 (52)	BM-MSC, ADSC	Hidrojeller, kollajen iskele	Osteoartirit	Kök hücre temelli tedaviler, TME osteoartritinde inflamasyonun azaltılması, kıkırdak rejenerasyonunun desteklenmesi ve eklem fonksiyonlarının iyileştirilmesi açısından umut verici sonuçlar göstermiştir.
Minervini ve ark. 2022 (53)	BM-MSC,ADSC, DPSC	PLGA, 3D baskılı iskele	Temporomandibular eklem rejenerasyonu	Mezenkimal kök hücreler, biyomalzemeler ve doku mühendisliği yaklaşımlarının kombinasyonu, temporomandibular eklemin kemik ve kıkırdak dokularının rejenerasyonu için yenilikçi bir strateji sunmakta olup, gelecekte hasta spesifik rekonstrüksiyon uygulamalarında önemli bir potansiyel taşımaktadır.
On ve ark. 2021(58)	ADSC,BM-MSC	Hücre enjeksiyonları, PRF	MRONJ	MSC'ler ve MSC kaynaklı eksozomların anjiyogenezi artırma, inflamasyonu baskılama ve kemik iyileşmesini destekleme özellikleri nedeniyle MRONJ tedavisinde umut verici bir rejeneratif yaklaşım sunduğunu bildirmiştir.

Pasquali ve ark. 2021 (63)	BMA	İliak kortikokansellöz kemik grefti	Kemik ogmentasyonu	Blok greftleme prosedürlerinde kemik iliği aspiratı (BMA) kullanımı, periferik kan ile yapılan konvansiyonel greftleme yöntemlerine kıyasla kemik rejenerasyonunu ve osteojenik potansiyeli daha etkin şekilde artırmıştır.
Asahina ve ark. 2021 (64)	BMMSC	PRP, β-TCP	Maksiller sinüs ogmentasyonu	BMMSC, PRP ve β-TCP kombinasyonu, ileri derecede atrofik maksillanın rekonstrüksiyonunda güvenli ve klinik olarak uygulanabilir bir rejeneratif yaklaşım olarak değerlendirilmiştir.
Sanchez ve ark. 2020 (61)	PDLSC	Ksenogreft	Periodontal defekt	PDLSC'lerin ksenogreft ile kombinasyonu güvenli ve iyi tolere edilmiş olmakla birlikte, intrabony periodontal defektlerin tedavisinde tek başına ksenogreft kullanımına kıyasla belirgin bir ek klinik fayda sağlamamıştır.
Gundestrup ve ark. 2020 (57)	BM-MSC, ADSC	-	Osteoradyonekroz	MSC tedavileri, osteoradyonekrozda anjiyogenezi ve kemik iyileşmesini destekleyerek umut verici sonuçlar göstermiştir; ancak mevcut klinik kanıtlar sınırlıdır. |

Wang ve ark. 2020 (55)	DPSC	Sinir konduitleri	Sinir yaralanması	Kollajen scaffoldlar, sinir kılavuzları (nerve conduits), hücre transplantasyonu | DPSC'ler nörotrofik faktör salgılayarak aksonal rejenerasyonu, miyelinizasyonu ve fonksiyonel sinir iyileşmesini desteklemiştir.
Chen ve ark. 2016 (65)	PDLSC	Ksenogreft	Periodontal intrabony defekt	PDLSC tedavisi periodontal defektlerin tedavisinde güvenli bulunmuştur.

6. MEVCUT SINIRLILIKLAR VE GELECEK PERSPEKTİFLERİ

Kök hücre temelli tedavilere ilişkin umut verici sonuçlara rağmen, bu yaklaşımların rutin klinik kullanıma aktarılmasını sınırlayan önemli zorluklar bulunmaktadır. Hücre izolasyonu, çoğaltılması, uygulanması ve sonuçların değerlendirilmesine yönelik standart protokollerin bulunmaması çalışmalar arasında önemli farklılıklara neden olmaktadır. Ayrıca kök hücre kaynağı, donör özellikleri ve kullanılan biyomalzemelerdeki değişkenlik tedavi sonuçlarını etkileyebilmektedir. Mevcut kanıtların büyük bölümü preklinik çalışmalara veya sınırlı hasta sayısına sahip klinik araştırmalara dayanmaktadır (67,68).

Gelecekte yapılacak çalışmaların, standartlaştırılmış tedavi protokollerinin geliştirilmesine ve uzun dönem sonuçları değerlendiren geniş ölçekli klinik araştırmalara odaklanması gerekmektedir. Bunun yanında biyomalzeme teknolojileri, doku mühendisliği yaklaşımları ve eksozom temelli hücresiz tedavilerdeki gelişmelerin, kök hücre temelli rejeneratif tedavilerin klinik uygulanabilirliğini artırması beklenmektedir (51).

7. SONUÇ

Kök hücre temelli tedaviler, kemik, periodontal doku, yumuşak doku, temporomandibular eklem ve sinir rejenerasyonu gibi birçok alanda umut verici sonuçlar ortaya koymuştur.

Mevcut veriler, dental ve dental olmayan kaynaklardan elde edilen mezenkimal kök hücrelerin doku iyileşmesini destekleyerek rejeneratif süreçleri güçlendirebildiğini göstermektedir. Biyomalzemeler ve doku mühendisliğindeki gelişmelerle birlikte

değerlendirildiğinde, kök hücre temelli yaklaşımlar oral ve maksillofasiyal rekonstrüksiyonda

biyolojik olarak yönlendirilmiş ve fonksiyonel doku yenilenmesini hedefleyen yenilikçi bir tedavi stratejisi olarak öne çıkmaktadır.

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Long QT Syndrome and QT-Prolongation Risk in Oral and Maxillofacial Surgery Practice: A Three-Case Series and Literature Review

Abstract

Objective: Long QT syndrome (LQTS) and acquired QT prolongation are clinically relevant in oral and maxillofacial surgery because dental anxiety, pain, local anesthetic administration, possible vasoconstrictor exposure, sedative/anesthetic drugs, and commonly prescribed medications may influence sympathetic tone or cardiac repolarization. This study presents three cases managed in dental anesthesia practice and integrates them with a narrative review of the perioperative and dental anesthesia literature to highlight why QTc-related risk recognition is important during surgical dental procedures.

Cases and Literature Review: Three patients who underwent oral and maxillofacial procedures under anesthesia or sedation are presented. The first case was a 9-year-old girl with congenital LQTS1 and a history of exercise-related syncope. Her odontogenic cyst surgery was completed uneventfully under propofol–remifentanil-based total intravenous anesthesia. The second case was a 9-year-old boy with LQTS2 and severe dental anxiety. A previous attempt at primary tooth extraction could not be completed because of intense crying and tachycardia; the current procedure was successfully performed under monitored dexmedetomidine sedation following intranasal midazolam premedication. The third case was a 45-year-old man scheduled for odontogenic cyst surgery. In this patient, medication-related QTc prolongation was detected in association with the concomitant use of a selective serotonin reuptake inhibitor, clarithromycin, and ondansetron, and the elective procedure was postponed until ECG findings normalized. A literature review including more than ten relevant studies indicates that perioperative QTc-related risk may be influenced by multiple factors, including congenital channelopathies, emotional stress, sympathetic activation, emergence from anesthesia, anesthetic drug selection, antiemetic and antibiotic use, psychotropic medications, and acquired drug-induced QT prolongation.

Conclusion: In oral and maxillofacial surgery, LQTS and acquired QTc prolongation should be approached as a multifactorial perioperative safety issue rather than as a rare cardiologic diagnosis alone. Careful history taking, medication review, ECG assessment when indicated, cardiology consultation, continuation of beta-blocker therapy, effective anxiety and pain control, avoidance of unnecessary QT-prolonging drugs, individualized anesthetic planning, and close hemodynamic monitoring may allow safe surgical dental care.

1. Introduction

Long QT syndrome is a cardiac ion channel disorder characterized by delayed ventricular repolarization and prolongation of the QT interval. It may be congenital or acquired, and both forms may predispose patients to torsades de pointes, syncope, seizure-like episodes, or sudden cardiac death. Sympathetic activation caused by physical or emotional stress, as well as several perioperative medications, may provoke malignant arrhythmias in susceptible patients (1).

This issue is particularly relevant for oral and maxillofacial surgery practice. Surgical dental procedures are frequently associated with pain, fear, crying in pediatric patients, local anesthetic administration, possible vasoconstrictor exposure, sedation or general anesthesia, and postoperative prescription of antibiotics, analgesics, or antiemetics. Each of these factors may influence autonomic tone or cardiac repolarization. Therefore, QTc-related risk is not only an anesthesiologic concern but also a practical perioperative safety issue for oral surgeons, dental anesthesiologists, and dental teams.

Pediatric LQTS patients may be vulnerable during periods of increased sympathetic activity, especially during anxiety-provoking procedures, painful stimulation, and emergence from anesthesia. In addition, exposure to drugs that prolong the QT interval or alter repolarization may further increase perioperative risk (2). These concerns are highly relevant in dental anesthesia, where behavioral distress, procedural pain, sedative or anesthetic drug selection, local anesthetic planning, and postoperative medication use may occur within the same clinical pathway.

Because the QT interval is heart-rate dependent, corrected QT interval (QTc) values were used for clinical interpretation in the present cases. This report presents three cases of QTc-related risk encountered in oral and maxillofacial surgery practice and integrates these cases with a narrative review of the current perioperative and dental anesthesia literature. By combining congenital LQTS cases with a medication-related acquired QTc prolongation case, this study aims to emphasize the importance of careful preoperative history taking, medication review, cardiology consultation when indicated, individualized anesthetic planning, and avoidance of unnecessary QT-prolonging drugs in surgical dental care.

2. Case Reports

Case 1

A 9-year-old girl with known congenital long QT syndrome type 1 (LQTS1) was scheduled for surgical treatment of an odontogenic cyst. Her medical history revealed previous syncope during

exercise. She had been evaluated by pediatric cardiology and was receiving beta-blocker therapy. Preoperative electrocardiography showed normal sinus rhythm and normal QRS duration, with a prolonged corrected QT interval (QTc) of 510 ms.

Pediatric cardiology recommended continuation of beta-blocker therapy and stated that general anesthesia could be performed under close hemodynamic monitoring, provided that QT-prolonging drugs and maneuvers causing sympathetic nervous system activation were avoided. To minimize sympathetic stimulation related to anxiety and pain, total intravenous anesthesia was performed using propofol and remifentanil infusions. Lidocaine was used for intraoperative local anesthesia, and paracetamol was administered for postoperative analgesia. The perioperative course was uneventful.

Case 2

A 9-year-old boy with known long QT syndrome type 2 (LQTS2) presented for extraction of the maxillary left primary first molar (tooth 64). The patient was receiving beta-blocker therapy. A previous extraction attempt had failed because of intense crying, tachycardia, and inability to complete the procedure. Preoperative electrocardiography showed sinus tachycardia at 115 beats/min, prolonged corrected QT interval (QTc: 520 ms), delayed repolarization, and prominent T waves.

Pediatric cardiology recommended continuation of beta-blocker therapy, avoidance of QT-prolonging medications and anxiety-provoking maneuvers, and close hemodynamic monitoring during general anesthesia or sedation. Before intravenous cannulation, intranasal midazolam 5 mg was administered for premedication. After vascular access was obtained, the patient was transferred to the operating room. Dexmedetomidine sedation was selected to provide anxiolysis and sympatholysis while limiting respiratory depression. A loading dose of 1 µg/kg was administered over 10 minutes, followed by an infusion of 1 µg/kg/h. Lidocaine local anesthesia was provided for analgesic support. The procedure was completed under close monitoring without hemodynamic instability, bradycardia, or arrhythmic complications.

Case 3

A 45-year-old man was scheduled for surgical treatment of an odontogenic cyst. He had a history of penicillin allergy and was receiving a selective serotonin reuptake inhibitor for depression.

Clarithromycin had been prescribed for a dental infection, after which he developed nausea and used ondansetron. He also reported panic attacks and intermittent palpitations. Preoperative electrocardiography demonstrated QTc prolongation of 500 ms.

The patient was referred for cardiology consultation. The prolonged QTc was interpreted as medication-related acquired QT prolongation. Cardiology recommended discontinuation of the relevant medications, repeat electrocardiographic assessment, and avoidance of QT-prolonging drug groups during anesthesia. The elective procedure was postponed. One week later, after normalization of ECG findings, surgery was performed. Anesthesia was induced with propofol, fentanyl, and rocuronium, followed by propofol and remifentanil infusions for maintenance. Articaine was used for local anesthesia. No perioperative complication occurred.

3. Narrative Literature Review

3.1. Congenital LQTS and perioperative risk

Congenital LQTS is a cardiac ion channelopathy associated with delayed ventricular repolarization and increased susceptibility to torsades de pointes. Kies et al. emphasized that sympathetic stimulation and several drugs, including anesthetic agents, may provoke torsades de pointes, syncope, seizure-like episodes, or sudden cardiac death in susceptible patients (1). Their review remains one of the key anesthesiology references supporting preoperative recognition, avoidance of QT-prolonging medications, continuation of appropriate cardiac therapy, and readiness for malignant arrhythmia management.

Booker et al. summarized perioperative management of known LQTS patients as continuation of beta-blocker therapy, normalization of serum electrolytes, avoidance of QT-prolonging drugs, anxiolytic premedication, minimization of sympathetic stimulation, vigilant ECG monitoring, quiet recovery, and adequate postoperative analgesia (3). Similarly, Krönauer and Friederich described a structured perioperative management approach for patients with LQTS, emphasizing adequate preoperative preparation, careful anesthetic drug selection, perioperative ECG/QT monitoring, and preparedness for immediate pharmacologic or electrical intervention in the event of torsades de pointes (4). These recommendations are directly relevant to the first case, in which cardiology consultation, continuation of beta-blocker therapy, avoidance of

unnecessary QT-prolonging drugs, and close hemodynamic monitoring were prioritized before general anesthesia.

Beta-blocker therapy is considered a central component of management in most patients with congenital LQTS. Moss et al. reported that beta-blocker treatment was associated with a significant reduction in cardiac event rates; however, syncope, aborted cardiac arrest, and LQTS-related death continued to occur during prescribed beta-blocker therapy, particularly in patients who were symptomatic before treatment (5).

Genotype-specific triggers are also clinically important. Schwartz et al. demonstrated that life-threatening arrhythmic events in LQTS tend to occur under gene-specific circumstances: exercise and swimming were particularly associated with LQT1, whereas emotional stress and auditory stimuli were more characteristic triggers in LQT2; LQT3 events were more frequently associated with rest or sleep without arousal (6). This is consistent with the first case, in which the child with LQTS1 had exercise-related syncope, and with the second case, in which the child with LQTS2 experienced marked anxiety, crying, and tachycardia during a previous dental attempt.

3.2. Pediatric LQTS and anesthesia-related risk

Pediatric patients with LQTS deserve special attention because perioperative stressors such as procedural anxiety, crying, painful stimulation, separation from parents, venous cannulation, airway manipulation, and emergence from anesthesia may increase sympathetic activity. Nathan et al. evaluated children with congenital LQTS undergoing anesthesia and reported perioperative arrhythmia-related adverse events in 3 of 114 anesthetic encounters. Notably, these events occurred despite preoperative beta-blocker therapy and were observed during emergence from anesthesia, in close temporal association with the administration of reversal drugs and ondansetron (2).

In contrast, Whyte et al. provided a more reassuring perspective regarding modern anesthesia in children with LQTS. In their multicenter retrospective review, 103 children underwent 158 general anesthetic episodes. No perioperative torsades de pointes was observed during incidental surgeries, whereas all five torsades de pointes episodes occurred in neonates or infants undergoing LQTS-related interventions. This finding suggests that, with optimized perioperative management, modern anesthesia for selected incidental noncardiac procedures may be safer than older case reports

imply. However, the upper confidence interval reported by the authors indicates that the risk is not zero, and careful perioperative planning remains essential (7).

Kuntz et al., in a recent educational review on pediatric arrhythmias, emphasized that patients with inherited arrhythmia syndromes such as congenital LQTS are at risk for polymorphic ventricular tachycardia and torsades de pointes, particularly when exposed to QT-prolonging medications and perioperative triggers that increase sympathetic activity (8). They also highlighted the need for anesthesiologists to understand the effects of perioperative medications on the QT interval and transmural dispersion of repolarization. This is highly relevant for dental anesthesia, where anxiety, pain, sedative medications, local anesthetic use with vasoconstrictors, and postoperative prescriptions may converge within the same clinical episode.

3.3. Anesthetic drug selection and QTc effects

Selection of anesthetic technique is an important component of risk reduction in patients with known or suspected QTc prolongation. Propofol-based total intravenous anesthesia is often considered a rational option because of its relatively limited effect on QTc compared with several volatile anesthetics. Cai et al., in a network meta-analysis of randomized clinical trials in adults, reported that propofol had a smaller effect on QTc prolongation than sevoflurane, desflurane, isoflurane, and halothane (9). Although this evidence was derived from adults with normal QTc intervals and without cardiovascular disease, it provides indirect support for considering propofol-based anesthesia in selected patients with increased repolarization risk, while recognizing that more robust evidence is still needed in patients with LQTS or cardiac disease.

Earlier comparative studies also suggested that volatile anesthetics may prolong the QT interval more prominently than propofol. Kleinsasser et al. reported that sevoflurane significantly prolonged both the QT and heart rate–corrected QT intervals in otherwise healthy female patients, whereas propofol shortened the QT interval and did not significantly affect the corrected QT interval (10). These findings are consistent with the rationale for the anesthetic strategy used in the first and third cases, in which propofol–remifentanil-based total intravenous anesthesia was selected to attenuate sympathetic responses and avoid unnecessary exposure to agents with greater QTc-prolonging potential.

The choice of adjunct medications is equally important. Antiemetics, reversal agents, certain antibiotics, psychotropic medications, and some analgesics may affect cardiac

repolarization. Kuryshev et al. showed that 5-hydroxytryptamine 3 receptor antagonists can interact with human cardiac ion channels, including cardiac sodium channels and the HERG potassium channel, providing a mechanistic basis for caution with antiemetics such as ondansetron in susceptible patients (11). In pediatric patients with congenital LQTS, Nathan et al. also observed arrhythmia-related adverse events in close temporal association with ondansetron and anticholinesterase/anticholinergic reversal drug administration during emergence from anesthesia (2). Together, these findings support avoiding routine use of QT-prolonging antiemetics in high-risk patients unless clearly indicated, and favoring alternative strategies when possible.

3.4. Acquired QT prolongation and relevance to oral and maxillofacial surgery Acquired QT prolongation is especially relevant for oral and maxillofacial surgery because patients may be exposed to multiple medications before and after dental procedures. Antibiotics, antiemetics, psychotropic medications, analgesics, and drug interactions may converge in the same patient. This is illustrated by the third case, in which selective serotonin reuptake inhibitor therapy, clarithromycin use, ondansetron intake, palpitations, and panic attacks created a clinically relevant risk profile. Detection of QTc prolongation before elective surgery allowed cardiology consultation, discontinuation of suspected medications, repeat ECG assessment, and postponement of surgery until ECG normalization.

Niimi et al. emphasized that perioperative torsades de pointes may occur when patient-related susceptibility, QT-prolonging medications, electrolyte disturbances, bradycardia, and perioperative stressors coexist (12). This concept is particularly relevant to dental surgery, where anxiety and pain may increase sympathetic tone while commonly prescribed perioperative medications may affect cardiac repolarization. Therefore, acquired QT prolongation should not be regarded solely as a cardiology issue; it should also be recognized as a practical perioperative safety concern in dental anesthesia and oral and maxillofacial surgery.

Previous dental anesthesia literature further supports the relevance of QTc-related risk assessment in oral healthcare settings. Rochford and Seldin reviewed the management of dental patients with LQTS and emphasized stress reduction, careful medical history, awareness of QT-prolonging medications, and appropriate dental treatment planning in this population (13). Seto et al. reported medication-related QT-interval prolongation detected during preoperative evaluation for oral and maxillofacial surgery, supporting

the importance of medication review and ECG assessment before elective dental procedures in selected patients (14). These reports are consistent with the present cases, particularly the child with severe dental anxiety and the adult patient with medication-related acquired QTc prolongation.

4. Discussion

These three cases, together with the reviewed literature, demonstrate that QTc-related risk in oral and maxillofacial surgery is not limited to patients with known congenital LQTS. Rather, it should be considered a multifactorial perioperative safety issue involving congenital channelopathies, dental anxiety, pain, sympathetic stimulation, anesthetic and sedative drug selection, local anesthetic planning, and commonly prescribed QT-prolonging medications. The integration of case-based clinical experience with perioperative and dental anesthesia literature strengthens the practical relevance of this issue for both oral surgeons and dental anesthesiologists.

The first case illustrates surgical planning in a child with established congenital LQTS1 and previous exercise-related syncope. For oral and maxillofacial surgeons, this type of patient requires more than routine preoperative clearance. The procedure should be planned with attention to beta-blocker continuation, cardiology consultation, avoidance of unnecessary QT-prolonging drugs, and prevention of anxiety- and pain-related sympathetic activation. Propofol–remifentanil-based total intravenous anesthesia was selected to suppress stress responses and avoid volatile anesthetic exposure. Propofol has been reported to have a smaller effect on QTc prolongation than several volatile anesthetics in adults, supporting its use as a rational option in selected patients with repolarization risk (9).

The second case highlights a common problem in pediatric dental practice: severe dental anxiety. In LQTS, intense crying, fear, tachycardia, and painful stimulation may increase sympathetic tone and potentially lower the threshold for arrhythmic events. Therefore, sedation in such patients should not be viewed only as behavioral management; it may also be part of autonomic stress reduction. Dexmedetomidine was selected for anxiolysis and sympatholysis with limited respiratory depression. However, because bradycardia may be relevant in LQTS, careful titration and continuous monitoring were essential.

The third case is especially important for daily oral surgery practice. The patient did not have known congenital LQTS, but medication-related QTc prolongation was detected before elective odontogenic cyst surgery. Penicillin allergy, clarithromycin use, SSRI therapy, ondansetron use, panic

attacks, and palpitations created a clinically relevant risk profile. This case shows that oral surgeons and dental anesthesiologists may identify acquired QTc prolongation through careful medication history and ECG assessment. Postponing the elective procedure until ECG normalization allowed safer anesthetic management.

Overall, these cases emphasize that perioperative safety in oral and maxillofacial surgery depends on a team-based approach. Oral surgeons should recognize red flags such as syncope, seizure-like episodes, family history of sudden death, palpitations, severe procedural anxiety, and use of QT-prolonging medications. Dental anesthesiologists should individualize anesthetic technique, maintain close monitoring, and prepare for malignant arrhythmia management. Local anesthetic use should also be planned carefully, using the lowest effective dose, avoiding intravascular injection, and considering the balance between vasoconstrictor exposure and inadequate analgesia-related sympathetic activation.

5. Conclusion

Long QT syndrome and acquired QTc prolongation are clinically important in oral and maxillofacial surgery because surgical dental procedures may combine anxiety, pain, local anesthesia, sedation or general anesthesia, and QT-prolonging prescriptions within the same perioperative pathway. The three cases presented here and the reviewed literature suggest that QTc-related risk should be approached as a preventable and multifactorial perioperative safety issue rather than as a rare cardiologic diagnosis alone. Careful medical and medication history, ECG assessment when indicated, cardiology consultation, continuation of beta-blocker therapy when appropriate, effective anxiety and pain control, avoidance of unnecessary QT-prolonging medications, individualized anesthetic planning, and close hemodynamic monitoring are essential for safe dental anesthesia and surgical dental management.

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TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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Çok Aşamalı Temporomandibuler Eklem Tedavisi Sonrasında Hastaya Özel Total Eklem Protezi: Bir Olgu

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GİRİŞ

Temporomandibular eklem bozuklukları, temporomandibular eklemi, çiğneme kaslarını ve ilişkili yapıları etkileyen; ağrı, eklem sesleri, mandibular hareketlerde kısıtlılık ve fonksiyon kaybı ile karakterize klinik durumların genel adıdır. TME bozukluklarının etiyolojisi mekanik, kas-iskelet sistemi, inflamatuvar, travmatik ve psikososyal faktörlerin birlikte etkili olduğu multifaktöriyel bir süreçtir. TMB'lerin tedavisi, etiyolojiye ve klinik alt tipe göre planlanan basamaklı bir süreçtir; ilk basamakta hasta eğitimi, davranış düzenlemesi, fizik tedavi, egzersiz, farmakolojik destek ve oklüzal splint gibi konservatif yöntemler uygulanabilir. Tedaviye dirençli intraartiküler patolojilerde minimal invaziv girişimler(artrosentez, artroskopi), ileri dejeneratif veya yapısal bozukluklarda ise cerrahi tedavi seçenekleri değerlendirilir. TMB'lerde cerrahi teknik seçimi; hastalığın etiyolojisi, klinik evresi, ağrı ve fonksiyon kaybının şiddeti, görüntüleme bulguları, konservatif tedaviye yanıt, eklemdeki yapısal hasarın derecesi ve hastaya ait sistemik/psikososyal faktörler birlikte değerlendirilerek yapılır. Temel prensip, patolojiyi tedavi edebilecek en az invaziv yöntemin seçilmesi; ileri dejeneratif, ankilotik veya rekonstrüksiyon gerektiren olgularda ise açık cerrahi ya da total eklem replasmanının değerlendirilmesidir. Son dönem TME patolojisi, eklemde geri dönüşümsüz yapısal bozulma, kronik ağrı ve belirgin fonksiyon kaybı ile karakterize ileri evre bir patolojidir. Bu olgularda TME replasmanı; ankiloz, travma, tümör sonrası defekt, başarısız rekonstrüksiyon, inflamatuvar hastalık veya gelişimsel anomaliler gibi durumlarda son tedavi seçeneği olarak değerlendirilir. Bu olgu sunumunun amacı, son dönem TME patolojisi nedeniyle hastaya özel total alloplastik TME protezi uygulanan bir olgunun tedavi sürecini ve klinik sonuçlarını sunmaktır.

OLGUMUZ

Sistemik olarak sağlıklı 46 yaşındaki kadın hasta, 2016 yılında bilateral TME ağrısı ve ağız açmada kısıtlılık şikâyetiyle kliniğimize başvurdu. İlk aşamada bilateral artrosentez uygulandı ve sağ TME semptomları geriledi. Sol TME'de ağrı ve ağız açma kısıtlılığının devam etmesi üzerine 2021 yılında interpozisyonel artroplasti yapıldı. Buna rağmen şikâyetlerin sürmesi nedeniyle Haziran 2024'te preauriküler ve submandibular yaklaşımla hastaya özel sol total TME protezi uygulandı. Hasta postoperatif 1. hafta, 6. ay ve 1. yıl kontrollerinde düzenli olarak takip edildi.

SONUÇLAR

Hastada Pitozis,göz kuruluğu ,corrugator supercilli kas fonksiyonunda azalma gözlenlenmiş olup steroid proflaksisi ve agresif fizik tedavi (terebayt cihazı) ile gulguların zamanla azaldığı gözlemlendi.

TARTIŞMA VE LİTERATÜR DERLEMESİ

Total alloplastik TME replasmanı, son dönem TME hastalığında ağrıyı azaltmak, fonksiyonu artırmak ve yaşam kalitesini iyileştirmek için etkili bir tedavi seçeneğidir. Hastaya özel protezler kompleks olgularda anatomik uyum açısından avantaj sağlayabilir; ancak olası komplikasyonlar nedeniyle uzun dönem takip gereklidir. Bu olgu, uygun hasta seçimiyle kişiye özel total TME replasmanının güvenli ve etkili bir alternatif olabileceğini göstermektedir.

Almeida ve ark., 2025 Uzun dönem TMJR etkinliği ve yaşam kalitesi	Sistematik derleme; 64 çalışma, 2387 hasta.	Son dönem TME patolojileri: osteoartrit, inflamatuvar artrit, ankiloz, travma, kondiler rezorpsiyon ve neoplazm.	Ağrıda genel olarak %75-87 azalma; MIA'da ortalama 26-36 mm kazanım; fonksiyon ve yaşam kalitesinde belirgin iyileşme. Sınırlılık: çalışmalar heterojen.	TMJR'nin son dönem TME hastalığında ağrıyı azaltma, fonksiyonu artırma ve yaşam kalitesini iyileştirme açısından güçlü bir seçenek olduğunu destekler.
Nolden ve ark., 2025/2026 Hasta spesifik implantlar ile hazır implantların karşılaştırılması	Sistematik derleme ve meta-analiz; 42 gözlemsel çalışma, 2221 hasta.	Unilateral veya bilateral TMJR; hasta spesifik implant veya hazır sistem implant uygulanan olgular.	PSI çoğu takip zamanında ağız açıklığı açısından daha iyi eğilim gösterdi. >12 ayda PSI lehine anlamlı MMO artışı: MD 5,83 mm, p=0,025. Ağrı sonuçları karışık; PSI 6-24 ayda avantajlı, hazır implantlar erken ağrı ve >24 ay diyet açısından avantajlı göründü.	PSI her olguda mutlak üstün değildir; ancak hareket kısıtlılığı, kompleks anatomi ve revizyon olgularında anatomik uyum ve fonksiyon açısından avantaj sağlayabilir.
Gerber ve ark., 2025 Erişkin TMJR komplikasyonları	Sistematik derleme ve meta-analiz; 35 çalışma.	Erişkin total alloplastik TMJR hastaları.	Genel komplikasyon oranı %38,9. En sık: geçici fasiyal sinir yaralanması %24,1; kalıcı duyu değişikliği %17,4; persistan postoperatif ağrı %11,5. Kalıcı fasiyal sinir yaralanması %2,0; heterotopik kemik %4,3; enfeksiyon %1,8; maloklüzyon %1,0; donanım başarısızlığı %0,1.	TMJR genel olarak güvenli kabul edilse de fasiyal sinir yaralanması, duyu değişikliği, persistan ağrı ve heterotopik kemik oluşumu mutlaka vurgulanmalı; uzun dönem takip gereklidir.
Ravelo ve ark., 2025 Dejeneratif / inflamatuvar TME hastalıklarında TMJR	Sistematik derleme; 16 çalışma, 760 katılımcı; takip 12-120 ay.	Dejeneratif ve/veya inflamatuvar TME hastalıkları; osteoartrit en sık tanı.	760 hastanın 579'unda dejeneratif/inflamatuvar hastalık vardı. Preoperatif MIA ortalama 24,32 ± 5,8 mm; hastaların çoğunda orta-şiddetli ağrı ve fonksiyon kaybı vardı. Sınırlılık: tasarım ve ölçümler heterojen.	Dejeneratif TME hastalığı TMJR'nin önemli endikasyonlarından biridir; ağrı, diyet kısıtlılığı ve ağız açıklığı azalması cerrahi endikasyonu güçlendirir.
Guzmán ve ark., 2025 Özelleştirilmiş protezlerle fonksiyonel sonuçlar	Klinik olgu serisi; 6 kadın hasta; minimum 24 ay takip.	Şiddetli osteoartrit n=5, kondiler osteokondrom n=1.	JF 6,5'ten 3,5'e; DI 8'den 1,5'e; ağrı VAS 7'den 2'ye düştü. Postoperatif IMO ortalama 32-33 mm. Komplikasyon: 1 hastada vida yer değiştirmesi nedeniyle revizyon; uzun dönem fonksiyonel bozulma yok.	Hasta spesifik protezler ileri TME patolojisinde ağrı, diyet kapasitesi ve çene fonksiyonunda klinik olarak anlamlı iyileşme sağlayabilir.
Olate ve ark., 2025 Özelleştirilmiş protez kullanılarak TME replasmanının klinik analizi	Retrospektif klinik çalışma; başlangıçta 48 olgu, ≥1 yıl takipli 31 olgu; 47 protez; takip 12-104 ay, ortalama 38,09 ± 26,6 ay.	Dejeneratif hastalık %52,08; ankiloz %14,58; kraniyofasiyal sendrom %12,5; tümör %12,5; ICR %8,33.	Ağrı VAS 5,5 ± 2,3'ten 2,2 ± 0,4'e düştü. İnterinsizal açıklık 25,85 ± 10,2 mm'den 35,93 ± 4,2 mm'ye çıktı. %74,4 olguda ek fasiyal osteotomi yapıldı. 12 ay sonrası %38,7 lokalize fasiyal sinir değişikliği; protez çıkarımı ve enfeksiyon yok.	Özelleştirilmiş alloplastik TME replasmanı orta-uzun dönemde stabil, ağrıyı azaltan ve ağız açıklığını artıran bir seçenek olabilir; kompleks deformiteli olgularda ek osteotomi ihtiyacı sık olabilir.
Osman ve ark., 2025 Rekürren bilateral TME ankilozunda özel yapım total eklem replasmanı	Retrospektif çalışma; 6 hasta; minimum 12 ay takip.	Daha önce cerrahi geçirmiş rekürren bilateral TME ankilozu.	MIA 5,5 × 5,54 mm'den 1 yılda 35,17 × 2,99 mm'ye çıktı. Tüm hastalarda diyet kısıtlılığı düzeldi. Radyografik olarak protezler stabil izlendi. Majör komplikasyon yok; tüm hastalar memnuniyet bildirdi; örneklem küçük.	Önceki cerrahiye bağlı skar, bozulmuş anatomi ve rekürrens riski olan bilateral ankiloz olgularında özel yapım alloplastik protez güçlü bir rekonstrüktif seçenek olabilir.
Trento ve ark., 2025 Tek taraflı TME protezinin karşı taraf ekleme etkisi	Sistematik derleme; 8 çalışma; takip 6 ay-10 yıl arası.	Unilateral total TME protezi uygulanan ve karşı taraf TME'si sağlıklı olan hastalar.	4 çalışma yalnız unilateral protezleri, 4 çalışma bilateral girişimleri ve/veya kontrol gruplarını içerdi. Özel yapım protezler daha sık kullanıldı. Veri raporlaması heterojen; araştırma sorusuna net cevap verilemedi. Randomize çalışma yok; uzun dönem takip yetersiz.	Karşı taraf TME sağlıklıysa bilateral replasman otomatik olarak gerekli değildir; ancak unilateral protez sonrası karşı eklem fonksiyonu uzun dönemde izlenmelidir.

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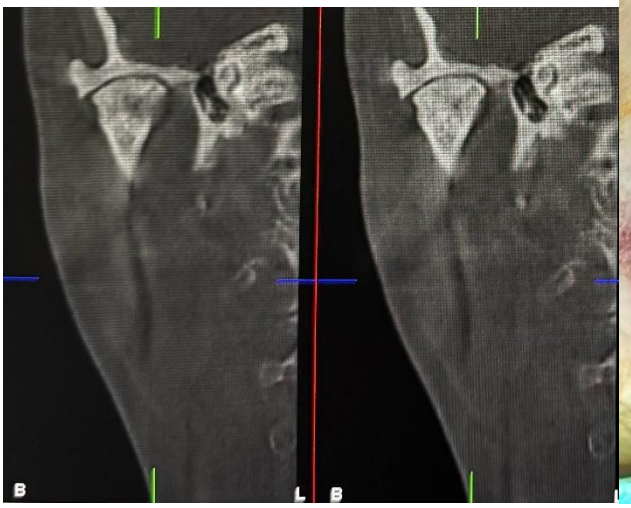
GÖRSELLER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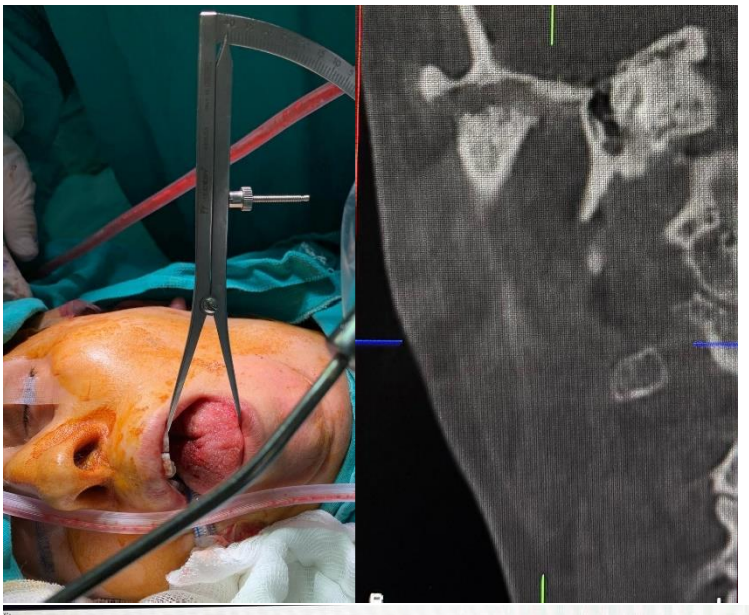
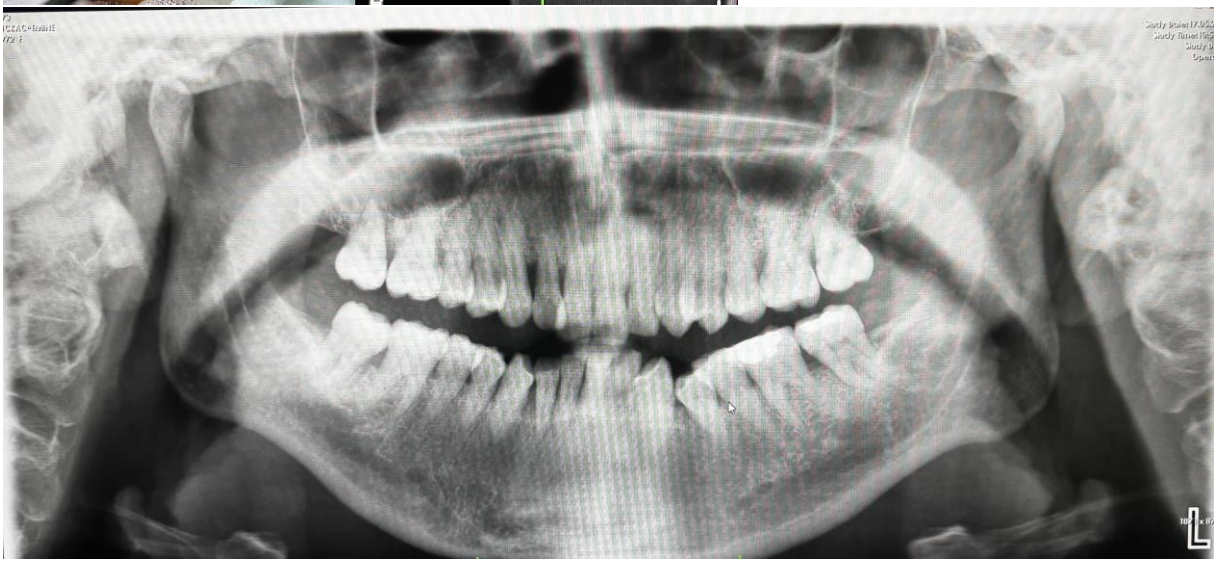
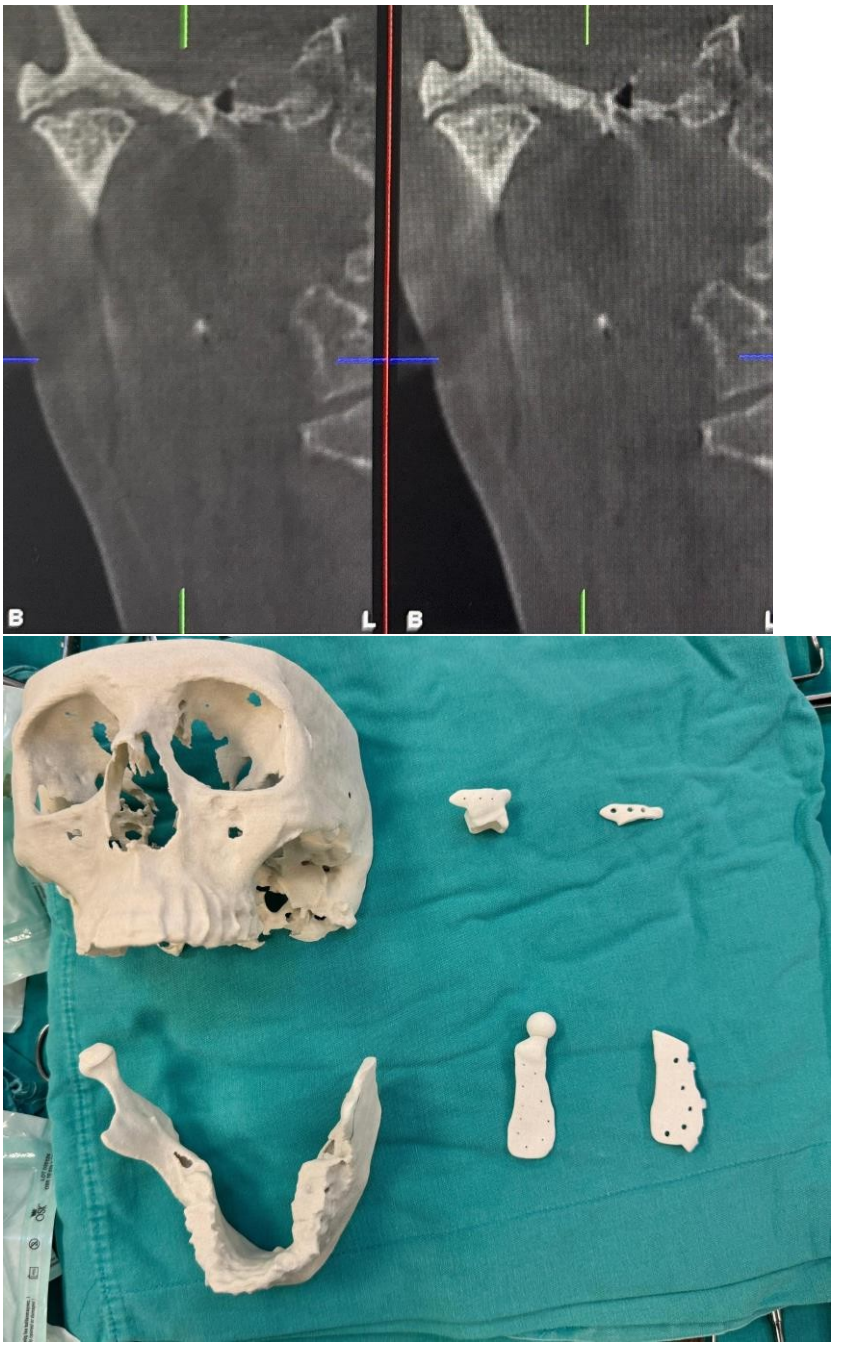
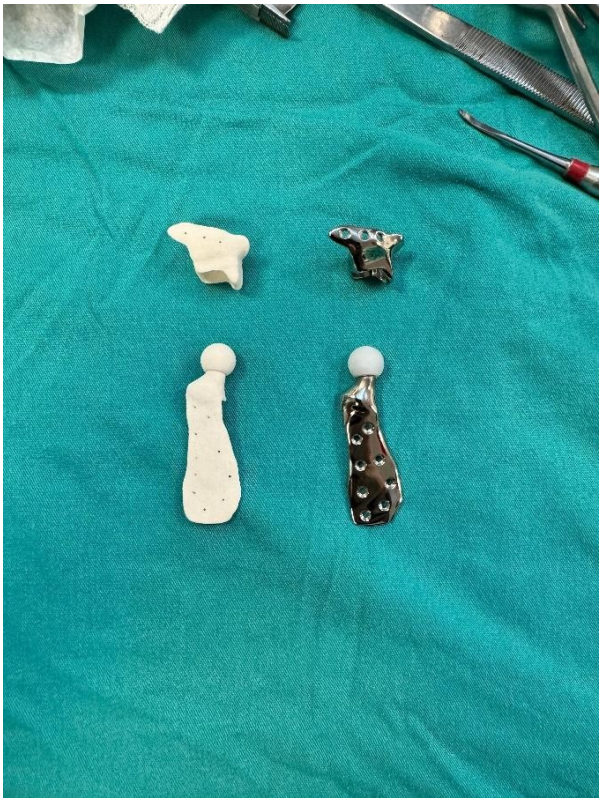




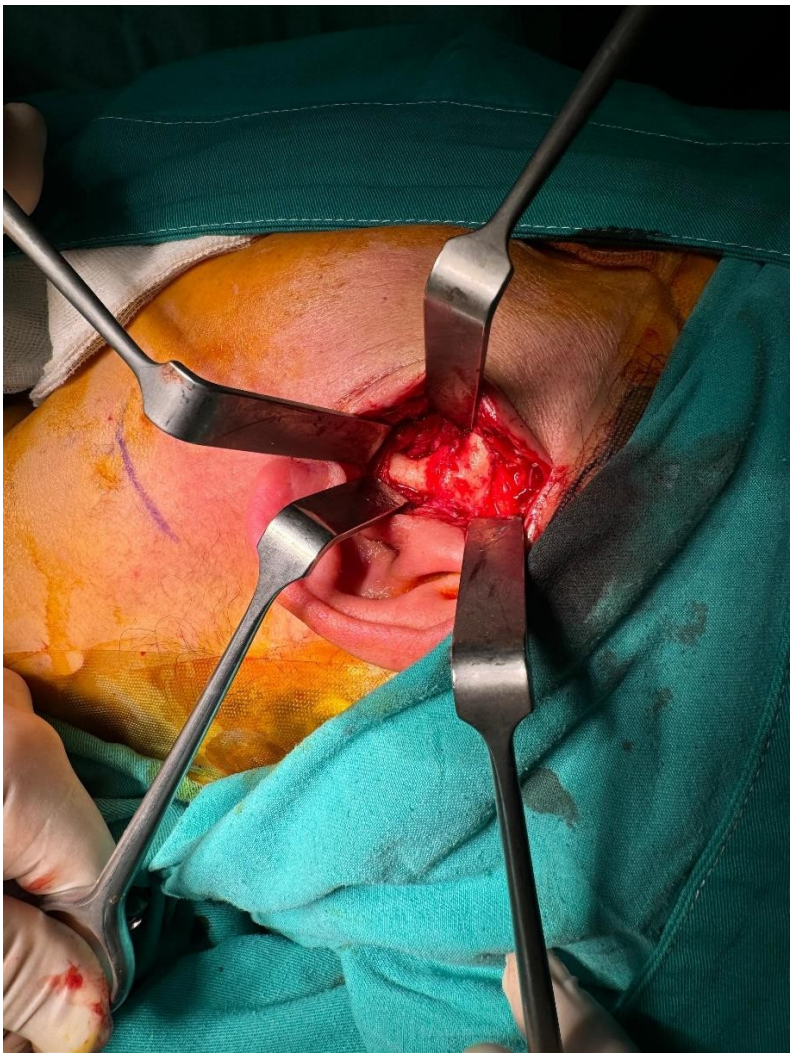


Osteotomi rehberleri ve eklem protezi modelleri

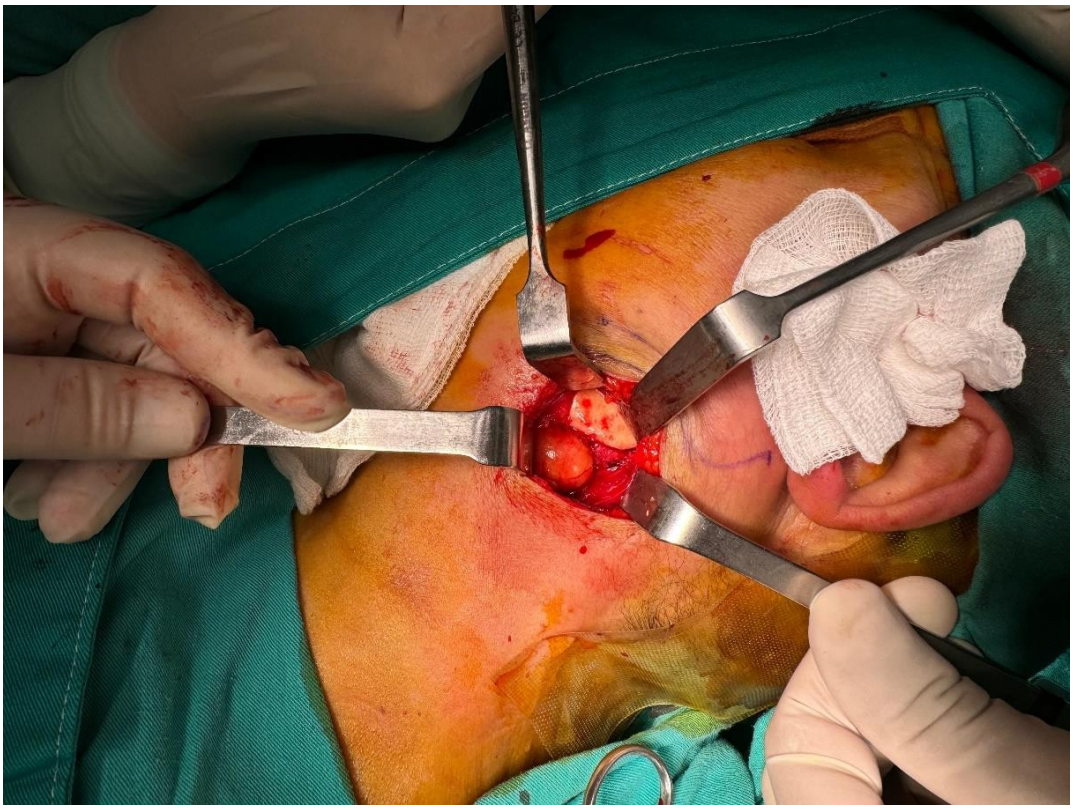


Ameliyat rehberi ve eklem protezinin karşılaştırılması

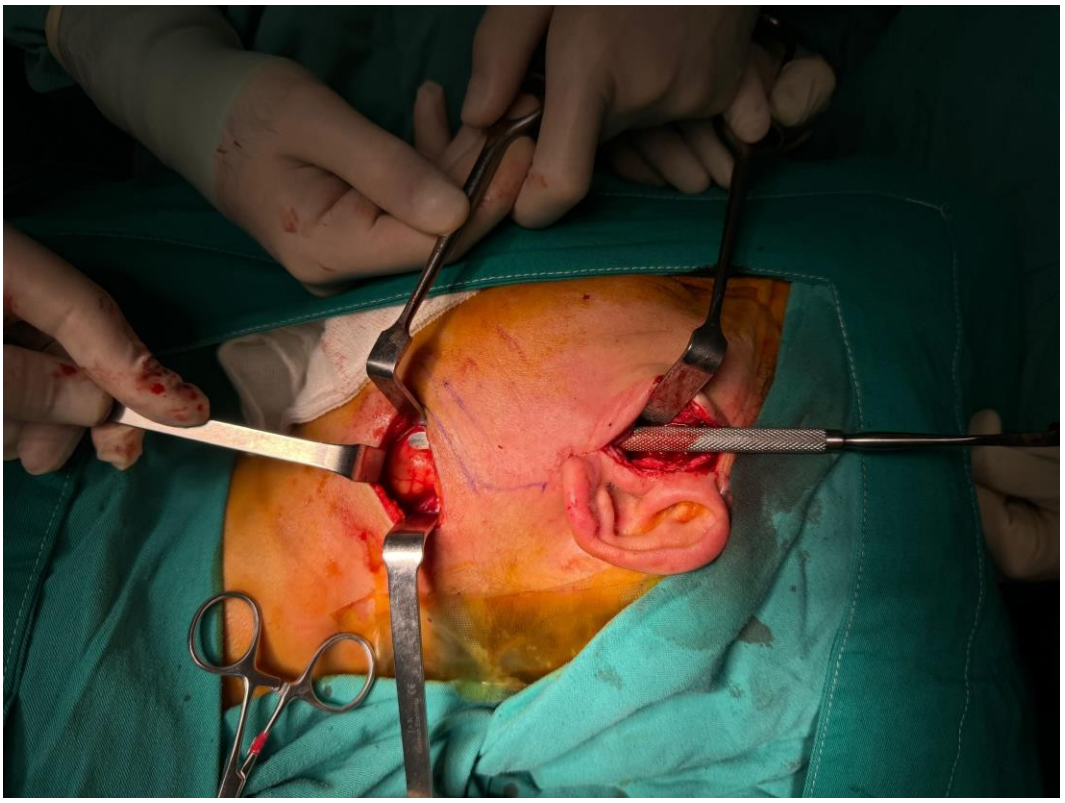
Preauriküler ve submandibuler insizyon sınırları



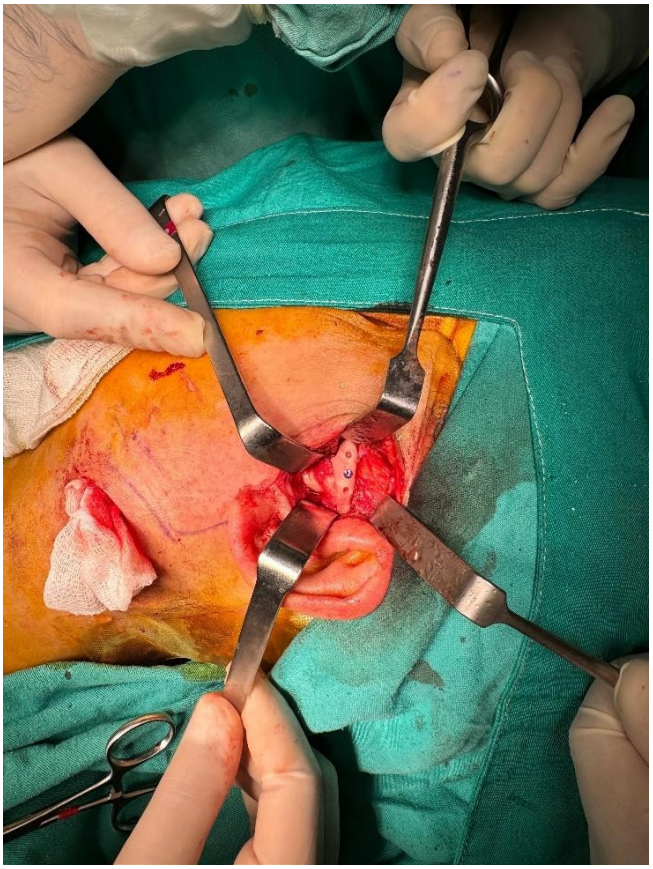
Preauriküler insizyonla zigomatik kemik ve kondilin açılması



Submandibular insizyonla ramus bölgesinin açılması



Preauriküler ve submandibuler insizyonla açılan fleplerin birleştirilmesi

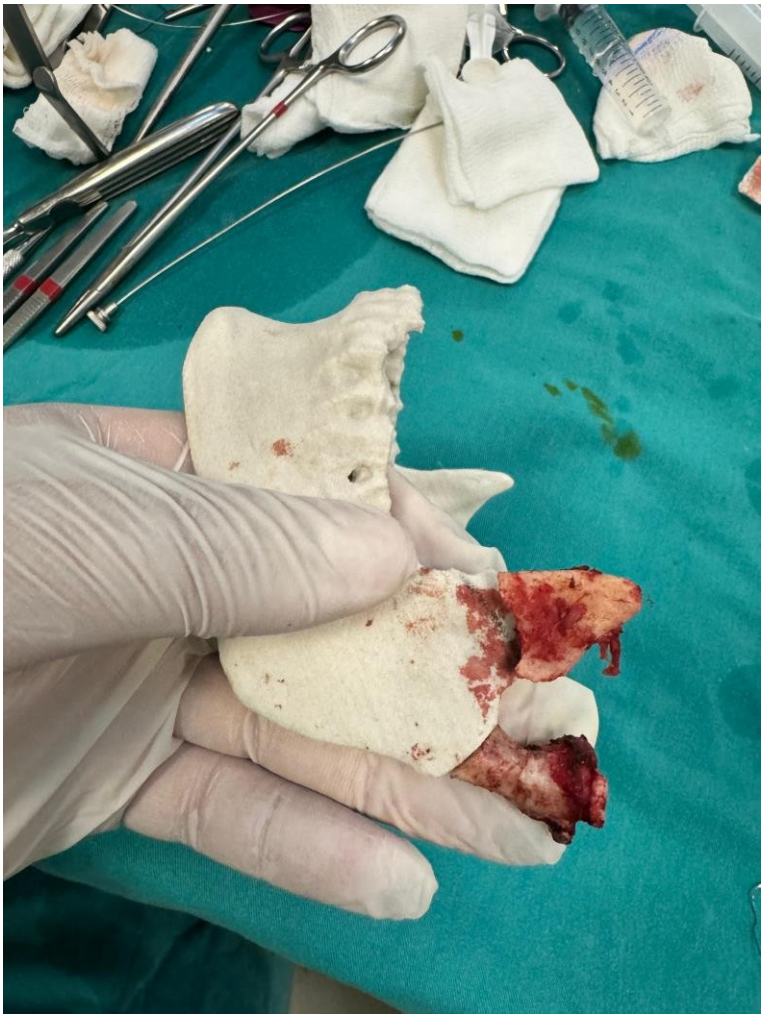


Glenois fossaya osteotomi rehberinin yerleştirilmesi

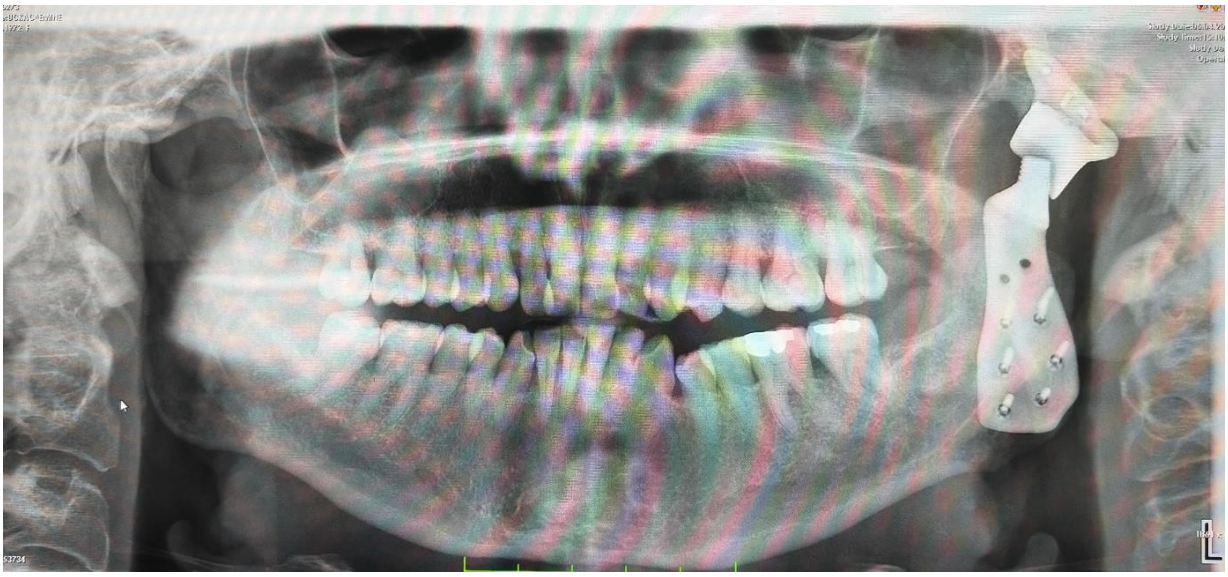
Ramus bölgesine osteotomi rehberinin yerleştirilmesi

Eksize edilen kondilin çıkartılması

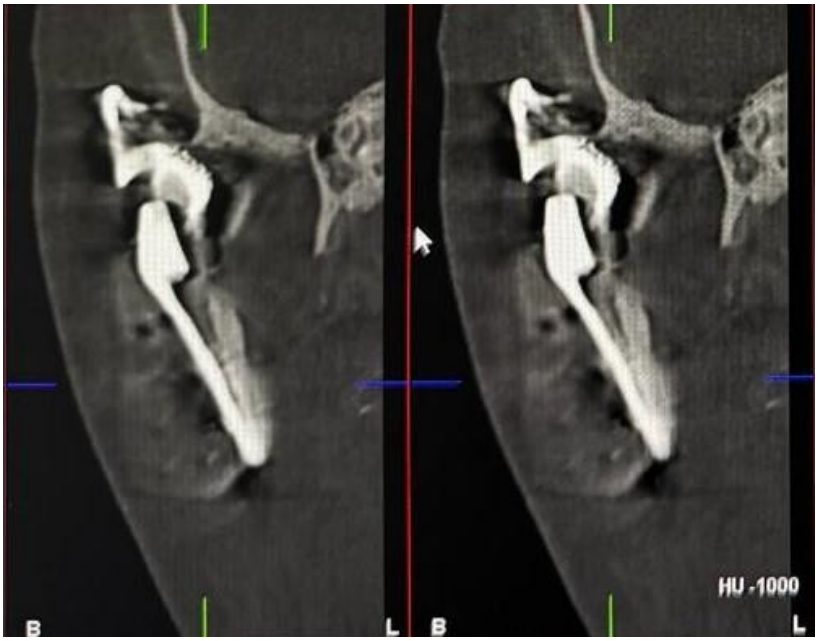
Eklem protezinin üst ve alt komponentlerinin yerleştirilmesi



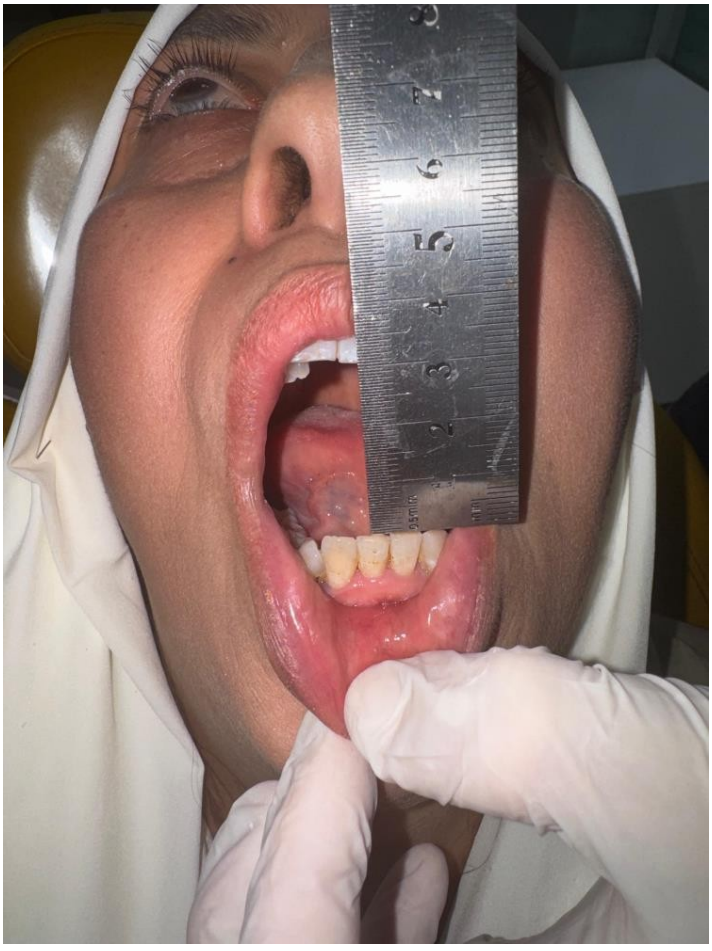
Kondil ve koronoid eksizyonu sonrası model üzerinde kontrol edilmesi

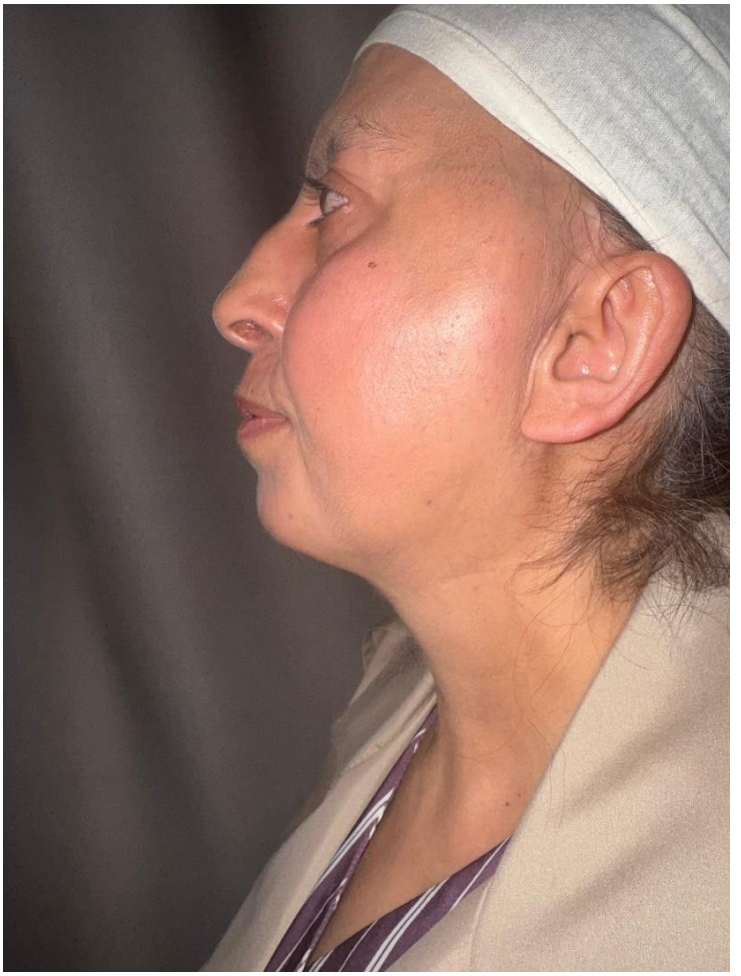


Operasyondan 2 yıl sonraki OPG



Operasyondan 2 yıl sonraki CBCT





Operasyondan 2 yıl sonraki kontrollerde ağız açıklığı ve ekstraoral yara yeri değerlendirilmesi

TAM METİN
POSTER BİLDİRİLER

EP-003

GUIDED IMMEDIATE IMPLANT PLACEMENT AND NATURAL TOOTH PROVISIONALIZATION IN MAXILLARY CENTRAL INCISORS: A CASE REPORT

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Abstract

Objective: The aim of this case report was to present the rehabilitation of maxillary central incisors affected by trauma related external root resorption using guided immediate implant placement, natural tooth provisionalization, and an early loading protocol.

Case: A 35-year-old systemically healthy female patient presented to our clinic with complaints of discoloration and mobility in the anterior maxillary region. Clinical and radiographic examinations revealed trauma related external root resorption and Class III mobility in teeth 11 and 21. Immediate implant placement was planned to use a patient specific surgical guide. Supracrestal fiberotomy was performed prior to extraction, and the teeth were removed atraumatically. 3.5 × 11.5 mm Neobiotech IS-III implants were placed. Primary stability values of 45 Ncm and 50 Ncm were achieved, respectively. The buccal gap area was grafted using allograft material. The patient's extracted natural teeth were reshaped and used as provisional restorations on the same day. Laboratory Fabricated PMMA(Polymethyl Methacrylate) provisional restorations were delivered on the third postoperative day. Implant stability was reassessed on day 45, and the treatment proceeded to the definitive prosthetic phase. The treatment was completed with screw-retained zirconia crowns.

Conclusion: The combination of immediate implant placement, natural tooth provisionalization, and early loading may provide successful esthetic and functional outcomes in the anterior esthetic zone when performed with appropriate case selection and careful surgical prosthetic planning.

Key words: Anterior esthetic region, guided immediate implant placement, natural tooth provisional restoration

1. Introduction

Achieving esthetic success in implant therapy performed in the anterior esthetic zone depends not only on successful osseointegration but also on the preservation of peri-implant hard and soft tissues (1). Immediate implant placement has become a widely preferred treatment approach due to its ability to

shorten treatment duration and preserve soft tissue architecture (2). In particular, provisional restorations play a critical role in shaping the emergence profile and maintaining papillary support (3). Provisional restorations fabricated from the patient's natural tooth have been described as a biomimetic approach that contributes to the preservation of the existing soft tissue morphology (4). Furthermore, digital planning and the use of surgical guides improve the predictability of esthetic outcomes by facilitating accurate three dimensional implant positioning (5).

This case report presents the rehabilitation of maxillary central incisors affected by trauma induced external root resorption using immediate implant placement, natural tooth provisionalization, and an early loading protocol.

2. Case report

A 35-year-old systemically healthy female patient presented to our clinic with complaints of discoloration and mobility in the maxillary anterior region(figure 1).Clinical examination revealed Class III mobility in teeth 11 and 21. Panoramic radiography and cone-beam computed tomography (CBCT) demonstrated trauma-related external root resorption (figure 2), and extraction of the affected teeth was indicated.

A patient-specific surgical guide was designed using CBCT data and intraoral scans. During the digital planning phase, implant placement was planned in a palatal position to achieve an ideal esthetic and prosthetic emergence profile. In addition, the implants were planned to be positioned approximately 2 mm subcrestally relative to the bone level and approximately 5.5 mm apical to the gingival zenith point. Based on this planning, the screw access channel was predetermined to emerge through the cingulum area, thereby allowing an appropriate prosthetic axis and esthetic restoration (1,3). The passive fit of the surgical guide was verified prior to surgery(figure 3).

Supracrestal fiberotomy was performed to enhance papillary preservation and esthetic stability, followed by atraumatic extraction of the teeth.

The surgical guide was positioned intraoperatively, and osteotomy preparation was completed. 3.5 mm diameter and 11.5 mm length Neobiotech IS-III implants were placed. Primary stability values of 45 Ncm and 50 Ncm were obtained, respectively. Implant stability was evaluated using the AnyCheck device, and initial Implant Stability Test (IST) values of 79 were recorded. The AnyCheck device is a non-invasive device that measures implant stability by applying controlled percussion to the implant-abutment complex and recording IST values (6).

The buccal gap area was grafted using allograft material (7) (Figure 4). The extracted natural teeth were reshaped and used as provisional restorations on the same day (4) (Figure 5). On the third postoperative day, laboratory-fabricated PMMA provisional restorations were delivered(Figure 6). At the 45-day follow-up appointment, IST values of 85 and 88 were obtained, and the treatment proceeded to the definitive prosthetic phase. The treatment was completed with screw-retained zirconia crowns(Figure 7).

3. Discussion

Immediate implant placement and provisionalization contribute to the preservation of esthetic outcomes in the anterior esthetic zone by minimizing hard and soft tissue loss (1,2). In particular, provisional restorations fabricated from the patient's natural tooth help preserve the existing emergence profile and support peri-implant soft tissue contouring (3,4).

Gonzalez-Martın et al. emphasized the importance of critical and subcritical contours of provisional restorations for maintaining soft tissue stability (3). Therefore, in the present case, PMMA provisional restorations were delivered on the third postoperative day to optimize soft tissue contouring.

According to the dual-zone therapeutic concept described by Tarnow et al., grafting of the buccal gap area contributes to hard and soft tissue stability in immediate implant cases (8). In the present case, the buccal gap was grafted with allograft material to support tissue preservation. Furthermore, high primary stability values enabled the safe application of an early loading protocol (2,9).

Objective assessment of implant stability is essential in early loading protocols. The AnyCheck device measures IST values by applying controlled percussion to the implant-abutment complex and enables non-invasive monitoring of the osseointegration process (6). In the present case, the increase in IST values between baseline and follow-up measurements supported successful osseointegration.

Hamilton et al. and Morton et al. emphasized the importance of accurate three dimensional implant positioning and adequate primary stability in immediate implant placement and loading protocols (2,9). In the present case, digital planning enabled predetermined implant positioning, cingulum based screw access emergence, and the establishment of an appropriate esthetic emergence profile.

4. Conclusion

Immediate implant placement combined with natural tooth provisionalization and early loading may provide successful esthetic and functional outcomes in the anterior esthetic zone when performed with appropriate case selection, atraumatic surgical techniques, and accurate prosthetic planning. In particular, provisional restorations fabricated from the patient's natural teeth may contribute to the preservation of the emergence profile and peri-implant soft tissue stability.

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6. Figures

Figure 1: Discolored maxillary central incisors

Figure 2: Panoramic radiographic appearance of external root resorption

Figure 3: Passive fit of the surgical guide

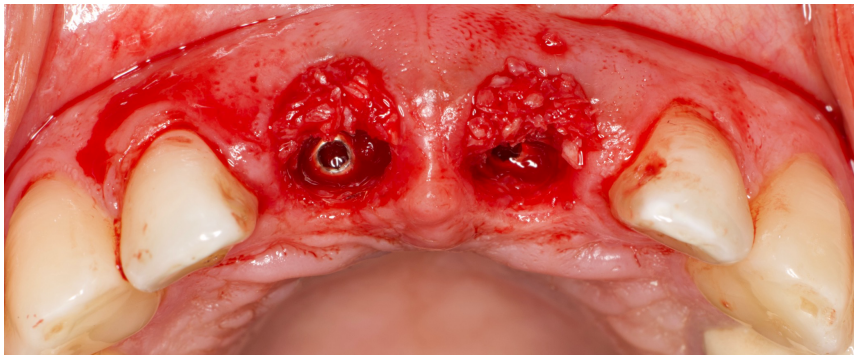

Figure 4: Dual-zone grafting

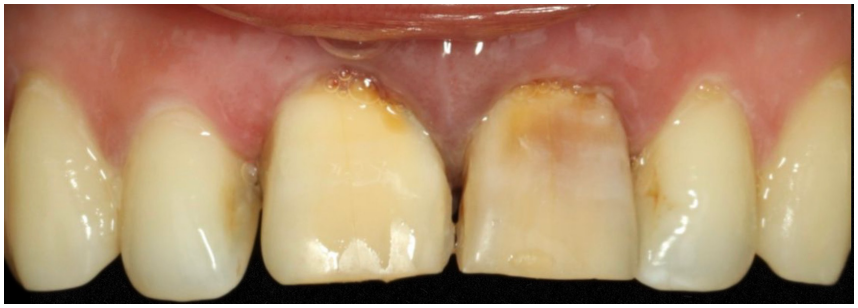

Figure 5: Provisional restoration using the natural tooth

Figure 6: Provisional restoration fabricated from PMMA (polymethyl methacrylate)

Figure 7: Definitive zirconia crown

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LARGE MANDİBULAR DENTİGEROUS CYST ASSOCİATED WİTH DEVELOPİNG PERMANENT MOLARS: A PEDİATRİC CASE REPORT

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Abstract

Objectıve: A dentigerous cyst is a developmental odontogenic cyst that surrounds the crown of an unerupted tooth and is attached to the tooth at the cemento-enamel junction. Although most cases are asymptomatic, enlargement of the lesion may result in jaw expansion, facial asymmetry, displacement of adjacent teeth, and delayed eruption. According to the literature, dentigerous cysts are reported more frequently in males and in the mandible, particularly in the posterior region; however, their occurrence in the first decade of life is considerably less common. Therefore, clinical awareness and careful radiological evaluation are particularly important in pediatric patients.

Case Presentatıon: An 8-year-old girl presented with extraoral swelling in the right mandibular region. Her medical history was unremarkable. Intraoral examination revealed swelling in the right mandibular molar area. Panoramic radiography and computed tomography showed a well-defined radiolucent lesion measuring approximately 3 × 4 cm and extending from the right mandibular molar region to the mandibular angle. The lesion was associated with the partially erupted first permanent molar and involved the second permanent molar, which was still in the follicular stage and located near the ramus. Because of poor cooperation, treatment was performed under general anesthesia. Enucleation of the cyst was carried out together with extraction of the second permanent molar. A drain was placed and sutured to support eruption of the first permanent molar. Histopathological examination confirmed the diagnosis of a dentigerous cyst.

Result: Dentigerous cyst should be considered in the differential diagnosis of pediatric patients presenting with posterior mandibular swelling. Treatment should be individualized according to lesion size, tooth position, eruption potential, patient cooperation, and follow-up conditions.

Keywords

Dentigerous cyst, pediatric case, mandible

1. Introduction

A dentigerous cyst is a developmental odontogenic cyst that surrounds the crown of an unerupted or impacted tooth and is attached to the tooth at the cemento-enamel junction [1,2]. Its pathogenesis is generally attributed to the accumulation of fluid between the reduced enamel epithelium and the crown of the tooth, resulting in cyst formation [1]. Dentigerous cysts are among the most common odontogenic cysts of the jaws after radicular cysts and are most commonly associated with impacted or unerupted permanent teeth [1,2]. They are most frequently found in the mandible, particularly in the posterior region, and are commonly reported in association with third molars, maxillary canines, and mandibular premolars [5,6].

These lesions are often asymptomatic and are usually detected incidentally on routine radiographic examination [1,2]. However, as the cyst enlarges, clinical and radiological findings such as jaw expansion,

cortical thinning, facial asymmetry, displacement of adjacent teeth, root resorption, and delayed eruption may become evident [1,2,6]. Particularly in pediatric patients, because these lesions are associated with developing permanent teeth, treatment planning should focus not only on removal of the lesion but also on preservation of the eruption potential of the involved teeth [3,4].

Although dentigerous cysts are more commonly seen in the second and third decades of life, they may also occur during childhood [5,7]. Their lower frequency in the first decade may delay diagnosis in pediatric patients [7,8]. Therefore, dentigerous cyst should always be considered in the differential diagnosis of swellings involving the posterior mandibular region in children. Early diagnosis, appropriate radiological assessment, histopathological confirmation, and an individualized surgical approach are important both for successful treatment of the lesion and for the long-term prognosis of the affected permanent teeth [1,3,4]. This case report presents the clinical, radiological, and surgical features of a large dentigerous cyst associated with developing permanent molars in the right posterior mandible of an 8-year-old child.

2. Case Report

An 8-year-old girl presented to our clinic with a complaint of extraoral swelling in the right mandibular region. Her medical history was unremarkable, with no evidence of systemic disease. Intraoral examination revealed swelling in the right mandibular molar region. Panoramic radiography and computed tomography demonstrated a well-defined radiolucent lesion measuring approximately 3 × 4 cm, extending from the right mandibular molar region to the angle of the mandible (Figure 1-2). The lesion was found to be associated with the partially erupted first permanent molar and also involved the second permanent molar, which was still in the follicular stage and located close to the ramus. Because the patient was uncooperative, treatment was planned under general anesthesia. Cyst enucleation was performed together with extraction of the second permanent molar, which was closely associated with the lesion. To support the eruption of the first permanent molar, a drain was placed in the surgical site and secured with sutures. Histopathological examination confirmed the diagnosis of a dentigerous cyst. At the postoperative third-month follow-up, the patient was asymptomatic, with no evidence of infection or recurrence at the surgical site; radiographic evaluation showed that bone healing was progressing regularly and eruption of the first permanent molar was being supported (Figure. 3)

3. Discussion

Although dentigerous cysts are less common in childhood than in adulthood, they are clinically significant when associated with developing permanent teeth during the mixed dentition period [1,7,8]. Radiographically, the typical appearance is a well-defined, usually unilocular radiolucent lesion surrounding the crown of an unerupted tooth [1,2]. However, in large lesions, the differential diagnosis should include odontogenic keratocyst, unicystic ameloblastoma, ameloblastic fibroma, and enlarged dental follicle [2].

Histopathological examination is required for definitive diagnosis [2]. In pediatric patients, marsupialization or decompression is frequently emphasized as a conservative treatment option because it may allow preservation of permanent teeth with eruption potential [3,4]. These approaches may be particularly

advantageous in cases in which root development is incomplete and the involved tooth is favorably positioned [3].

Nevertheless, enucleation is considered an appropriate treatment modality in cases of large lesions, when the associated tooth is deeply positioned or unfavorably located, and when definitive single-stage treatment with histopathological confirmation is desired [1,2,4]. In the present case, enucleation under general anesthesia was primarily chosen because the patient's lack of cooperation made a conservative approach based on prolonged decompression, regular irrigation, and close follow-up less feasible [4,9]. From a critical perspective, this may be considered a limitation of the present case, since marsupialization/decompression is generally advocated in pediatric dentigerous cysts when preservation of the associated permanent tooth is possible and may facilitate spontaneous eruption [3,4,10]. Therefore, if adequate patient compliance and follow-up had been achievable, a more conservative approach might have provided a better opportunity to observe or support eruption of the first permanent molar [3,9,10]. Nevertheless, because the available evidence regarding predictors of spontaneous eruption remains heterogeneous, treatment decisions should ultimately be individualized according to patient-related and lesion-related factors [3].

4. Conclusion

Dentigerous cyst should always be considered in the differential diagnosis of pediatric patients presenting with swelling in the posterior mandibular region [1,2]. Panoramic radiography and cross-sectional imaging contribute significantly to determining the extent of the lesion and the position of the associated teeth [1,6]. Treatment should be individualized according to lesion size, the position of the involved tooth, the patient's age, level of cooperation, eruption potential, and the feasibility of regular follow-up [3,4]. Histopathological confirmation and postoperative clinical and radiological follow-up are essential for evaluating bone healing and the eruption course of adjacent teeth [1,7].

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6. Figures

Figure 1. Preoperative panoramic radiograph showing a radiolucent lesion extending from the right mandibular molar region to the mandibular ramus.

Figure 2. Preoperative coronal CBCT image showing the radiolucent lesion and its relationship with the developing permanent molars.

Figure 3. Postoperative panoramic radiograph at the third-month follow-up demonstrating bone healing

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Endodontik Tedavi Sonrası Gelişen Kronik Periapikal Lezyona Bağlı Persistan Perioral Parestezi ve Vestibüler Mukozal Renk Değişikliği: Vaka Raporu

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Özet

Endodontik tedavi sonrasında ortaya çıkan nörosensöriyel değişiklikler yaygın görülmemekle birlikte klinik açıdan oldukça önem arz eden bir komplikasyon türüdür.

Bu vaka raporunda, 2008 yılında yapılmış endodontik tedaviden yaklaşık bir ay sonra gelişen ve persistan olarak devam eden perioral parestezi şikâyeti bulunan 67 yaşında erkek hasta sunulmaktadır. Parestezi, sağ üst dudak ve sağ nazal kanat bölgesine kadar uzanmaktadır. Klinik incelemede 11 numaralı dişin sağ vestibüler mukozasında mavi-mor renk değişikliği, radyografik incelemede ise apeks bölgesinde granülom varlığı saptanmıştır. Bu bulgular doğrultusunda apikal rezeksiyon planlanmıştır. Operasyon sonrasında yapılan 1., 3. ve 6. ay takiplerinde semptomlarda kademeli olarak gerileme gözlenmiş olmakla birlikte, uzun dönem takipte minimal düzeyde persistan perioral parestezi devam etmiştir. Yapılan histopatolojik incelemede benign karakterde kronik inflamatuar özellikler saptanmıştır.

Bu vaka raporu, kronik periapikal lezyonların tedavi edilmediği sürece uzun süreli perioral paresteziye yol açabileceğini göstermeyi ve cerrahi tedavinin önemini vurgulayarak klinik yaklaşıma katkı sağlamayı hedeflemektedir.

Anahtar Kelimeler: Perioral Parestezi, Kronik Apikal Lezyon, Endodontik Tedavi, Apikal Rezeksiyon, Nörosensöriyel Bozukluklar, Mukozal Renk Değişikliği

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Persistent Perioral Paresthesia and Vestibular Mucosal Discoloration Associated with a Chronic Periapical Lesion Following Root Canal Treatment: A Case Report

Abstract

Neurosensory changes following endodontic treatment are uncommon but represent clinically significant complications.

In this case report, a 67-year-old male patient presenting with persistent perioral paresthesia, which developed approximately one month after endodontic treatment performed in 2008 and has continued since then, is described. The paresthesia extended to the right upper lip and right nasal ala. Clinical examination revealed a bluish-purple discoloration of the vestibular mucosa of the tooth 11, while radiographic evaluation demonstrated the presence of a granuloma at the periapical region. Based on these findings, apical resection was planned.

At the 1-, 3-, and 6-month postoperative follow-ups, a gradual reduction in symptoms was observed; however, minimal persistent perioral paresthesia remained in the long term. Histopathological examination revealed benign chronic inflammatory features.

This case report suggests that untreated chronic periapical lesions may lead to long-term perioral paresthesia and highlights the importance of surgical intervention in clinical management.

Keywords: perioral paresthesia, chronic apical lesion, endodontic treatment, apicoectomy, neurosensory disturbances, mucosal discoloration

Giriş

Endodontik tedavi, başarı oranı yüksek bir dental tedavi olmasına rağmen nadir olarak nörosensör komplikasyonlar gözlemlenebilmekte ve bu komplikasyonlar hastanın yaşam kalitesini olumsuz olarak etkileyebilmektedir [1,2,3,4]. Kanal tedavisi sonrası gelişen perioral parestezi; trigeminal sinir dallarının travması, kimyasal irritasyonu veya kronik apikal inflamasyon ile ilişkili olabilir [2,4]. Bu vaka raporunun amacı, endodontik tedavi sonrası gelişen persistan perioral parestezinin cerrahi açıdan tedavisi ve uzun dönem takibini sunmaktır.

Olgu Sunumu

67 yaşındaki erkek hasta, 2008 yılında 11 numaralı dişe uygulanan endodontik tedavi sonrasında başlayan ve halen devam etmekte olan sağ üst dudak ve sağ nazal kanat bölgesinde persistan parestezi ile 11 numaralı diş ile ilişkili vestibüler mukozada mavi-mor renk değişikliği ile birlikte sağ üst çene, dudak ve lateral nazal cilt bölgesinde lokalize edilemeyen parestezi şikâyeti ile başvurdu.
Hastanın, medikal öyküsünde koroner arter bypass greft (CABG) ameliyatı ile tedavi edilmiş koroner arter hastalığı bulunuyordu. Hastanın mevcut ilaçları; asetilsalisilik asit (Ecopirin, Abdi İbrahim Türkiye) 100

mg, atorvastatin (Lipitor, Pfizer ABD) 20 mg, metformin (Glukofen, Bilim İlaç Türkiye) 1000 mg, nebivolol (Vasoxen, AstraZeneca İsveç) 10 mg, klopidogrel (Parkyn, Adeka Türkiye) 0,75 mg olup düzenli olarak kullanmaktaydı. Bununla birlikte, dental cerrahi planlamayı etkileyecek ek sistemik bir tıbbi kontrendikasyonu saptanmadı.
Klinik ve radyografik değerlendirmeler sonucunda, 11 numaralı dişin periapikal bölgesindeki lezyonun apikal rezeksiyon işlemi ile çıkartılması planlandı.

Tedavi Aşamaları

Cerrahi işlemden bir gün önce, hastanın medikal öyküsü dikkate alınarak Amoksisilin-klavunat 1 g 2x1 başlandı.
Asepsi-antisepsi hazırlığının ardından infiltratif anestezi tekniğiyle %4 artikain hidroklorür (1:200.000 epinefrin) uygulandı; sağ anterior superior alveolar sinir ve nazopalatin sinir bloğu hedeflendi.
21 numaralı dişten 13 numaralı dişe kadar intrasulkuler insizyona ilave olarak vertikal serbestleştirici insizyon yapıldı. Vestibüler mukoperiostal flep kaldırılarak kortikal kemik açığa çıkarıldı.
Vestibüler mukozaya komşu yaklaşık 12 mm x 10 mm x 7 mm boyutlarında ölçülen lezyon eksize edilerek histopatolojik inceleme amacıyla gönderildi. Histopatolojik incelemede, eski hemoraji bölgeleri, fibrotik değişiklikler ve benign kemik trabekülleri saptandı.
Bunu takiben 11 numaralı diş apeksinde 3 mm apikal rezeksiyon gerçekleştirildi. Cerrahi alan, debrisin uzaklaştırılması amacıyla steril serum fizyolojik ile irrigasyon yapılarak temizlendi.
Flep yeniden konumlandırıldı ve 3/0 ipek sütür ile bölge kapatıldı.
Hastaya postoperatif dönemde Amoksisilin-klavulanat 1 g (7 gün), Flurbiprofen 100 mg (5 gün), %0,12 klorheksidin diglukonat – benzidamin HCl gargara (7 gün) reçete edildi.
Sütürler 7 gün sonra alındı. Hasta 1., 3. ve 6. aylarda klinik olarak takip edildi. Takiplerde hastanın operasyondan önce beyan ettiği subjektif parestezi şikayetinde 3.ayda azalma, 6.ayda ise belirgin düzeyde gerileme gözlenmiştir; ancak minimal düzeyde persistan parestezi devam ediyordu. Vestibüler mukozadaki renk değişikliğinde ise takip süresi boyunca belirgin azalma gözlendi.

Sonuç ve Öneriler

Bu vaka sunumu, kronik periapikal lezyonların sinir dokusu üzerinde uzun süreli nörosensöriyel etkiler oluşturabileceğini desteklemekte; cerrahi müdahalenin semptomların giderilmesindeki önemini vurgulamakta ve apikal rezeksiyonun etkili bir tedavi yaklaşımı olabileceğini düşündürmektedir [5].
Apikal rezeksiyon benzer olgularda etkili bir tedavi seçeneği olmakla birlikte, uzun süreli sinir hasarında persistan semptomların zamanla kademeli olarak azalabileceği göz önünde bulundurulmalıdır [4,5]. Bu nedenle erken tanı ve uygun tedavi planlaması büyük önem taşımaktadır [1,2,4,5]. Bununla birlikte, endodontik tedavi sırasında uygun irrigasyon tekniklerinin kullanılması, işlemlerin dikkatli yürütülmesi ve potansiyel komplikasyonların erken dönemde yönetilmesi, nörolojik hasar riskinin azaltılmasında kritik rol oynayabilir [2,4,5]. Benzer vakalarda nörolojik hasara yol açan mekanizmaların daha iyi anlaşılabilmesi için ileri klinik araştırmalara ihtiyaç bulunmaktadır.

Kaynakça

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Figür Altyazıları

Figür 1: Vestibüler mukozadaki renk değişikliğinin preoperatif görünümü.

Figür 2: CBCT görüntüleri.

Figür 3: Vestibüler mukozada 11 no'lu diş apeksindeki lezyon ve lezyon kürete edildikten sonraki intraoperatif görünümü.

Figür 4: Flep tasarımı görünümü.

Figür 5: Post-operatif görünüm.

Figür 1

Figür 2

Figür 3

Figür 4

Figür 5

Figure Captions

Figure 1: Preoperative appearance of the discoloration in the vestibular mucosa.

Figure 2: CBCT images.

Figure 3: Lesion in the vestibular mucosa overlying the apex of tooth #11 and the intraoperative view after lesion curettage.

Figure 4: Flap design.

Figure 5: Postoperative appearance.

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DENTİGEROUS CYST ASSOCİATED WİTH AN İMPACTED TOOTH İN THE MANDİBULAR RAMUS: A CASE REPORT

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Objectıve: Dentigerous cyst is a developmental odontogenic cyst associated with the crown of an unerupted or impacted tooth and is among the most common odontogenic cysts of the jaws. Most cases are observed in the second and third decades of life, and these lesions are reported more frequently in the mandible, particularly in the posterior region. Radiographically, they typically appear as well-defined, corticated, unilocular radiolucent lesions surrounding the crown of an impacted tooth; however, especially in large lesions, differential diagnosis should include pathologies such as keratocyst and unicystic ameloblastoma. These lesions are often asymptomatic, and many cases are detected incidentally during routine radiographic examinations. Nevertheless, in progressively enlarging lesions, displacement of adjacent teeth, cortical bone thinning, root resorption, and, more rarely, expansion may be observed. Cases occurring in older patients and those located in the ramus should be evaluated carefully.

Case Presentatıon: A 50-year-old woman presented to our clinic for a routine dental examination. The patient had no symptoms. Panoramic radiography revealed a well-defined radiolucent lesion measuring approximately 1.5 × 3.5 cm, associated with impacted tooth 48 and extending along the mandibular ramus to the sigmoid notch. Radiographic examination showed no evidence of significant expansion related to the lesion. Clinical examination also revealed no swelling in the mandibular region. Based on the clinical and radiological findings, cyst enucleation and extraction of the associated impacted tooth were performed. Histopathological examination confirmed the final diagnosis of a dentigerous cyst.

Result: Although dentigerous cysts are more commonly encountered in young adults they may also occur in older patients and should be considered in the differential diagnosis of radiolucent lesions associated with impacted teeth located in the posterior mandible and ramus.This case highlights that dentigerous cyst should also be kept in mind in older patients presenting with radiolucent lesions of the mandibular ramus associated with an impacted tooth.

Keywords

Dentigerous cyst, impacted tooth, mandibular ramus

1. Introduction

Dentigerous cyst is a developmental odontogenic cyst associated with the crown of an unerupted or impacted tooth and is among the most common odontogenic cysts of the jaws [1,2]. It is regarded as the most common developmental cyst of the jaws and the second most common odontogenic cyst after radicular cysts [1,2]. Most cases occur in the second and third decades of life, and these lesions are

reported more frequently in the mandible, particularly in the posterior region [1]. Dentigerous cysts are most commonly associated with impacted mandibular third molars [1,3,4]. Their pathogenesis is generally attributed to the accumulation of fluid between the reduced enamel epithelium and the crown of the tooth, leading to expansion of the follicular space [2]. Radiographically, they typically appear as well-defined, corticated, and usually unilocular radiolucent lesions surrounding the crown of an impacted tooth [1,3,5]. However, as the lesion enlarges, displacement of adjacent teeth, root resorption, cortical bone thinning, and bony expansion may occur [3,7]. Dentigerous cysts are often asymptomatic, and many cases are detected incidentally during routine radiographic examinations [3,4]. Therefore, lesions occurring in older patients and those located in the mandibular ramus should be carefully evaluated from both clinical and radiological perspectives.

2. Case Report

A 50-year-old woman presented to our clinic for a routine dental examination. The patient had no symptoms. Clinical examination revealed no swelling in the mandibular region. Panoramic radiography demonstrated a well-defined radiolucent lesion measuring approximately 1.5 × 3.5 cm, associated with impacted tooth 48 and extending along the mandibular ramus to the sigmoid notch (Figure 1). Radiographic examination showed no evidence of significant expansion related to the lesion (Figure 2). Based on the clinical and radiological findings, cyst enucleation and extraction of the associated impacted tooth were performed. Histopathological examination confirmed the final diagnosis of a dentigerous cyst. Panoramic radiography at the third postoperative month demonstrated ongoing bone healing (Figure 3).

3. Discussion

Although dentigerous cysts are most frequently encountered in young adults, they may also occur in older patients [1,4]. While the second and third decades predominate in most series, a study evaluating dentigerous cysts associated with mandibular third molars reported a mean age of 45.9 years, indicating that third molar-associated dentigerous cysts may also be detected in older individuals [1,4]. In the present case, the lesion was identified incidentally on routine panoramic examination in a 50-year-old asymptomatic patient, which supports this observation. In addition, despite extending from the posterior mandible into the ramus, the lesion did not produce clinical swelling, which is consistent with the silent course often described for dentigerous cysts [3,4].

Radiographically, the typical appearance of a dentigerous cyst is a well-defined unilocular radiolucency surrounding the crown of an impacted tooth [3,5]. However, the differential diagnosis of radiolucent lesions associated with impacted teeth should also include odontogenic keratocyst, unicystic ameloblastoma, hyperplastic dental follicle, ameloblastic fibroma, and some rarer odontogenic lesions [3,5,6]. Because there may be considerable clinical and radiographic overlap between dentigerous cyst and unicystic ameloblastoma in particular, a definitive diagnosis should not be based on imaging alone [6]. Therefore, histopathological examination remains essential for confirmation of the final diagnosis [2,6].

The main treatment options for dentigerous cysts are enucleation and marsupialization, and the choice of treatment depends on lesion size, location, the possibility of preserving the associated tooth, the relationship with adjacent anatomical structures, and the feasibility of follow-up [2,7]. In adult patients with lesions associated with impacted third molars, enucleation together with extraction of the related tooth is a common and rational approach when functional preservation of the tooth is not expected [4,7]. In the present case, preoperative radiological evaluation showed preservation of the inferior alveolar canal and integrity of the mandibular basal bone, suggesting that the lesion could be safely managed by single-stage enucleation. Therefore, enucleation together with extraction of the associated impacted tooth was preferred over marsupialization. Histopathological confirmation of a dentigerous cyst supported the appropriateness of the selected surgical approach. No postoperative neurosensory deficit suggestive of inferior alveolar nerve injury was observed.

4. Conclusion

Although dentigerous cysts are more commonly encountered in young adults, they may also occur in older patients and should be considered in the differential diagnosis of radiolucent lesions associated with impacted teeth located in the posterior mandible and ramus [1,4,6]. In clinically asymptomatic cases, panoramic radiography may provide the first diagnostic clue [3,4]. However, definitive diagnosis should be established histopathologically, and treatment should be individualized according to lesion extent, location, and the status of the associated tooth [2,7]. The present case highlights that dentigerous cyst should also be kept in mind in older patients presenting with radiolucent lesions of the mandibular ramus associated with an impacted third molar.

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Figures

Figure 1. Preoperative panoramic radiograph showing a well-defined radiolucent lesion associated with impacted tooth and extending along the mandibular ramus to the sigmoid notch.

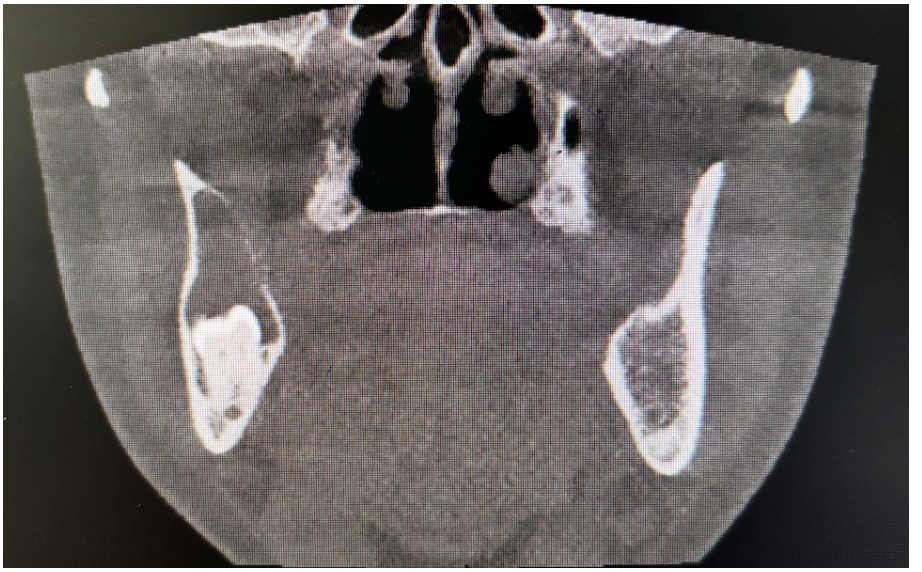

Figure 2. Preoperative coronal CBCT image showing the extent of the radiolucent lesion in the mandibular ramus.

Figure 3. Postoperative panoramic radiograph at the third-month follow-up showing bone healing.

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GUIDED IMPLANT SURGERY AND IMMEDIATE LOADING IN THE AESTHETIC ZONE: A CASE REPORT

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Abstract

Objectives: Implant treatment in the front upper jaw is challenging due to high aesthetic demands and delicate soft tissue conditions. It is essential to preserve the interdental papilla, maintain gingival contour and achieve a natural tooth–tissue relationship for successful outcomes. Flapless surgical techniques minimise surgical trauma, preserve blood supply and reduce postoperative morbidity. However, limited visibility requires precise planning. Digital planning and guided surgery are critical for implant positioning and improving aesthetic and functional results.

Case report: A 43-year-old female patient with a missing maxillary central incisor (tooth No. 21) underwent implant treatment following clinical and radiographic evaluation. CBCT-based digital planning was performed, and a surgical guide was fabricated. A 3.5 × 10 mm implant was placed using a flapless guided approach, and a vertical incision was made to perform the tunnel technique with an injectable graft. After achieving adequate primary stability, immediate loading was performed with a provisional restoration in the same session. Following osseointegration, a definitive restoration was delivered, demonstrating appropriate gingival contour, papilla formation, and occlusal harmony

Conclusion: Successful implant therapy in the aesthetic region depends on factors such as bone density, soft tissue characteristics, and accurate prosthetic positioning. Guided implant surgery enhances surgical precision and predictability, while immediate loading protocols, when adequate primary stability is achieved, support early functional and aesthetic outcomes. This case demonstrates that the combination of guided surgery, flapless approach, and immediate loading can result in favorable clinical and aesthetic outcomes.

Key words: : Dental Implants, Immediate Loading, Esthetics,

1. Introduction

Dental implant treatments are now a routine clinical practice, offering high success rates in the restoration of missing teeth. However, long-term success is directly linked to the correct three-dimensional positioning of the implant, appropriate angulation and prosthetic planning.(1)

Implant therapy in the anterior maxilla is particularly demanding due to elevated aesthetic expectations and the fragile nature of the surrounding soft tissues. Achieving successful outcomes

requires preservation of the interdental papilla, maintenance of the gingival contour, and establishment of a natural tooth–tissue relationship.

In implant procedures performed in the aesthetic zone, even minor positioning errors can adversely affect gingival contour and papilla formation (2). In the rehabilitation of single-tooth edentulism in the aesthetic zone using implants, the preservation of the alveolar ridge is of great importance, particularly in cases involving extensive buccal bone defects. In this context, prosthetically guided implant placement on the preserved alveolar ridge and patient-specific immediate temporary restorations can be achieved in a predictable manner through digital treatment planning. The digital workflow enables the three-dimensional assessment of clinical and radiographic anatomy through the integration of intraoral optical scans with cone-beam computed tomography data. Furthermore, implant placement is made possible through the prefabrication of temporary restorations using computer-assisted surgical techniques and titanium abutments produced via CAD/CAM technology.(3)

Alternatively, “flapless procedures” or “minimally invasive approaches”, which allow for implant placement without the need to lift mucosal flaps or expose bone tissue, are preferred in clinical practice.(4) Flapless anterior implant surgery allows for the preservation of the peri-implant tissue architecture, soft tissue papillae and vascular structure. This minimally invasive approach is associated with the preservation of bone crest volume, a reduction in soft tissue recession and improved aesthetic outcomes. It also enhances patient comfort by contributing to the preservation of the keratinised mucosa.(5)

One of the problems frequently encountered by oral and maxillofacial surgeons is inadequate alveolar ridge morphology in the planned dental implant site. It has been shown that following an uncomplicated tooth extraction, the width of the alveolar ridge decreases by approximately 50% within 12 months, with two-thirds of this reduction occurring within the first 3 months. (6) One of the most commonly used methods for treating horizontal bone deficiency is the use of barrier membranes for guided bone regeneration (GBR).(7) The tunnel technique, however, is an alternative method for horizontal augmentation and is particularly preferred in areas where there are two-walled defects or where the alveolar ridge has a distinct C-shaped curvature.(8)

The immediate loading protocol enhances the patient’s quality of life by enabling the rapid restoration of function and aesthetics following implant placement. It also helps to preserve soft tissue contours, thereby supporting more predictable outcomes, particularly in the aesthetic zone. In cases where adequate primary stability is achieved, shortening the treatment duration and increasing patient satisfaction are among its key advantages.(9)

This study presents a case in which prosthetic rehabilitation was performed in combination with guided implant surgery, a flapless approach and an immediate loading protocol in the aesthetic zone.

2. Case Report

A 43-year-old female patient with no underlying systemic conditions presented to the clinic complaining of a missing tooth (tooth No. 21). Following clinical and radiographic assessment, implant treatment was planned. Using cone-beam computed tomography (CBCT) data obtained during the preoperative period, the implant position was digitally planned to be ideal from a prosthetic perspective, and a surgical guide was prepared in accordance with this plan using the Exoplan (ver. 3.1, Rijeka, Darmstadt, Germany) software. Following this digital workflow, the surgical guide we produced was

manufactured in-house using an LCD-based 3D printer (Elegoo Mars 5 Ultra) with guide resin material (ArmaMed Surgical Guide Resin).

A tissue punch was used to perforate the gingival tissue in order to gain access to the bone without elevating a flap; the entire surgical procedure was performed under aseptic conditions, with copious irrigation and under local anaesthesia using Ultracain containing 4% articaine hydrochloride (1:100,000 epinephrine). The osteotomy was initiated with a pilot drill in the area where the punch was applied; following bone mapping, the final osteotomy was prepared using sequential drills, and a 3.5 × 10 mm Neobiotech (Seoul, South Korea) implant system was placed via a flapless surgical procedure for the restoration of the missing tooth. A torque value of 35 N/cm² was achieved during placement. A vertical incision was made to facilitate the tunnel technique, and injectable graft material was applied along this incision line. Following the achievement of adequate primary stability, immediate loading was performed during the same session, and a temporary fixed restoration was fabricated and fitted to the patient. This approach ensured that aesthetic and functional requirements were met at an early stage. To manage postoperative discomfort, the patient was prescribed antibiotics (Augmentin 1000 mg, twice daily) and analgesics (Arveles 25 mg, twice daily) for a period of 3 days. The patient was recalled for a routine check-up 2 days later, and no significant extraoral swelling was observed in the surgical area.

Following the completion of osseointegration, a permanent restoration was fabricated and placed on the implant in accordance with the prosthetic treatment plan. Clinical assessments revealed that the gingival contour, papillae formation and occlusal fit were satisfactory from both an aesthetic and functional perspective.

3. Discussion

The success of dental implants in the aesthetic region is not limited to osseointegration alone. Soft tissue stability and aesthetic harmony are also of critical importance. For this reason, the implant must be placed in the ideal prosthetic position.

Guided implant surgery ensures that the planned implant position is achieved with a high degree of accuracy. This technique reduces the risk of complications, particularly in the aesthetic zone, preserves the integrity of the bone and soft tissues, and makes the surgical process more predictable. With this method, less inflammation and faster healing are observed (10).

There is as yet no complete consensus regarding the effects of flapless and flap (open flap) dental implant surgery. A recent systematic review has demonstrated that the flapless approach has a significant impact on implant survival rates. However, some other analyses have reported no difference in implant survival or marginal bone loss (MBL) between the flapless technique and the traditional flap approach.(11) Furthermore, there is limited evidence to support the claim that guided flapless surgery provides significantly higher accuracy compared to non-guided procedures.(12)

Immediate loading yields successful clinical outcomes in cases where adequate primary stability is achieved and enables the patient’s aesthetic expectations to be met within a short timeframe(9).

However, this approach requires careful case selection. Bone volume and primary stability must be adequate. Furthermore, the restorative planning must be carried out with meticulous care.(1)

Current evidence from systematic reviews and meta-analyses suggests that delayed loading protocols in post-extraction implants may be associated with reduced peri-implant bone loss, whereas immediate loading protocols tend to demonstrate slightly higher survival and success rates. However, these findings should be interpreted with caution due to the limited number of high-quality, bias-controlled randomized clinical trials. Therefore, further well-designed randomized studies are required to provide more robust evidence regarding the long-term outcomes of different implant loading protocols in clinical practice.(13)

Further clinical trials are needed to assess the long-term outcomes.

4. Conclusion

The success of implant treatment in the aesthetic region is not limited to osseointegration alone; it depends on a number of factors, such as bone volume, soft tissue stability and the placement of the implant in an ideal prosthetic position.

In this regard, guided implant surgery enhances surgical predictability by enabling the planned implant position to be achieved with high precision, thereby reducing the risk of complications in the aesthetic zone. When combined with a flapless approach, it contributes to the preservation of peri-implant tissue architecture and may reduce postoperative morbidity. In cases where sufficient primary stability is achieved, the immediate loading protocol enables the early restoration of aesthetics and function, thereby increasing patient satisfaction. In the presented case, successful clinical and aesthetic outcomes were achieved through the combined application of digital planning, guided surgery, the flapless approach and the immediate loading protocol. It is considered that this approach constitutes a predictable and effective treatment option when applied with appropriate case selection.

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6. Figures

Figure 1: Preoperative frontal view of the patient

Figure 2: Placement of the patient-specific surgical guide

Figure 3: Guided bone regeneration using the tunnel technique

Figure 4: Postoperative panoramic radiograph (OPG)

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MANDIBULA POSTERIOR BÖLGEDE MEVCUT YETERSIZ VERTIKAL KEMIK YÜKSEKLIĞININ ÇÖZÜMÜ: SEGMENTAL OSTEOTOMI ILE İNTERPOZISYONEL GREFTLEME

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Özet

Giriş:To present the surgical management of severe vertical bone deficiency in the posterior mandible using segmental osteotomy with interpositional grafting.

Vaka Raporu: Kliniğimize sol mandibula posterior bölgede sabit protetik restorasyon isteğiyle başvuran 40 yaşında erkek hastada klinik ve radyografik incelemede belirgin vertikal kemik yetersizliği tespit edilmiştir (Resim1-3). Değerlendirme sonucu dental implant uygulaması öncesinde segmental osteotomi planlanmıştır. Cerrahi işlem lokal anestezi altında gerçekleştirilmiş ve operasyon sahasında submarjinal flep dizaynı oluşturulmuştur. Osteotomi kesileri piezo cerrahi cihazı kullanılarak tamamlanmıştır. Horizontal kesi alveolar inferior sinirin 5mm üzerinden, vertial kesiler ise; mesialde yandaki dişten 3mm uzakta olacak şekilde , distal vertikal kesi ise implant planlamasına uygun şekilde yapılmıştır. Sonrasında, kemik segmenti mobilize edilerek istenilen vertikal pozisyona getirilmiştir. Ardından 2 tane L plak ve plakları sabitlemek amacıyla 7 tane monokortikal vida kullanılmıştır (Resim4). Böylec

Sonuç: Postoperatif dönemde iyileşme komplikasyonsuz seyretmiş ve segment stabilitesi korunmuştur. Sonuç olarak, segmental osteotomi tekniği vertikal kemik yetersizliği bulunan olgularda implant öncesi kemik yüksekliğinin artırılmasında güvenilir ve etkili bir yöntemdir. Piezo cerrahi kullanımı ise cerrahi hassasiyeti artırarak tedavi başarısına olumlu katkı sağlamaktadır.

1. Giriş

Dental implant uygulamalarında yeterli kemik hacminin sağlanması tedavi başarısı açısından kritik öneme sahiptir. Vertikal kemik yetersizliği bulunan olgularda implant yerleştirilmesi zorlaşmakta ve ileri cerrahi tekniklere ihtiyaç duyulmaktadır. Bu sebeple literatürde çeşitli yöntemler tanımlanmıştır. Bunlardan biri de segmental osteotomi ve interpozisyonel greftleme olup, bu teknik alveolar kemiğin bir kısmının eleve edilmesi ve ardından plaklanması ile vertikal kemik yüksekliğinin artırılmasını sağlayan etkili yöntemlerden biridir*. Ayrıca piezo cerrahi sistemleri, osteotomi sırasında yumuşak dokuların korunmasına katkı sağlayarak cerrahi güvenliği artırmaktadır.

2. Vaka Raporu

Kliniğimize sol mandibula posterior bölgede sabit protetik restorasyon isteğiyle başvuran 40 yaşında erkek hastada klinik ve radyografik incelemede belirgin vertikal kemik yetersizliği tespit edilmiştir (Resim1-3). Değerlendirme sonucu dental implant uygulaması öncesinde segmental osteotomi planlanmıştır. Cerrahi işlem lokal anestezi altında gerçekleştirilmiş ve operasyon sahasında submarjinal flep dizaynı oluşturulmuştur. Osteotomi kesileri piezo cerrahi cihazı kullanılarak tamamlanmıştır. Horizontal kesi alveolar inferior sinirin 5mm üzerinden, vertial kesiler ise; mesialde yandaki dişten 3mm uzakta olacak şekilde , distal vertikal kesi ise implant planlamasına uygun şekilde yapılmıştır. Sonrasında, kemik segmenti mobilize edilerek istenilen vertikal pozisyona getirilmiştir. Ardından 2 tane L plak ve plakları sabitlemek amacıyla 7 tane monokortikal vida kullanılmıştır (Resim4). Böylece segmentin rijit fiksasyonu tamamlanmıştır. Daha sonrasında interpoziyonel greftleme amacıyla otojen partiküler greft ve Maxxeus corticocancellous allogreft (Solvita, Centennial, CO, USA) 1:1 oranında oluşan boşluğa yerleştirilmiştir (Resim 5). Stabilizasyonun ardından cerrahi saha primer olarak kapatılmıştır (Resim6). İşlem sonrası kontrol amacıyla panoromik röntgen alınmıştır (Resim 2).

4. Sonuç

Postoperatif dönemde iyileşme komplikasyonsuz seyretmiş ve segment stabilitesi korunmuştur. Sonuç olarak, segmental osteotomi tekniği vertikal kemik yetersizliği bulunan olgularda implant öncesi kemik yüksekliğinin artırılmasında güvenilir ve etkili bir yöntemdir. Piezo cerrahi kullanımı ise cerrahi hassasiyeti artırarak tedavi başarısına olumlu katkı sağlamaktadır.

5. Kaynakça

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Abstract

Objective:To present the surgical management of severe vertical bone deficiency in the posterior mandible using segmental osteotomy combined with interpositional bone grafting prior to dental implant placement.

Case:A 40-year-old male patient presented to our clinic seeking a fixed prosthetic rehabilitation in the left posterior mandible. Clinical and radiographic examinations revealed severe vertical alveolar bone deficiency (Figures 1–3). Following comprehensive evaluation, segmental osteotomy was planned prior to implant placement. The procedure was performed under local anesthesia using a submarginal flap design. Osteotomy cuts were completed with a piezoelectric surgical device. The horizontal osteotomy was performed approximately 5 mm superior to the inferior alveolar nerve, while the mesial vertical osteotomy was positioned 3 mm distal to the adjacent tooth and the distal vertical osteotomy was planned according to the implant position. The mobilized bone segment was elevated to the desired vertical level and rigidly stabilized using two L-shaped titanium plates and seven monocortical screws (Figure 4). The interpositional gap was grafted with a 1:1 mixture of autogenous particulate bone and Maxxeus corticocancellous allograft (Solvita, Centennial, CO, USA) (Figure 5). Primary wound closure was achieved following graft placement (Figure 6), and a postoperative panoramic radiograph was obtained for evaluation (Figure 2).

Conclusion: Postoperative healing was uneventful, and the repositioned bone segment remained stable throughout the follow-up period. Segmental osteotomy combined with interpositional bone grafting represents a reliable and effective treatment option for increasing vertical alveolar bone height prior to implant placement. In addition, piezoelectric surgery contributes to surgical precision while enhancing the safety of the procedure by minimizing soft tissue injury.

1. Introduction

Adequate alveolar bone volume is essential for successful dental implant rehabilitation. Severe vertical bone deficiency complicates implant placement and often necessitates advanced reconstructive surgical procedures. Various techniques have been described in the literature for vertical ridge augmentation. Among these, segmental osteotomy combined with interpositional bone grafting is considered an effective approach for increasing vertical bone height by mobilizing an alveolar bone segment and repositioning it in a superior position with rigid fixation. Furthermore, piezoelectric surgical devices improve surgical safety by enabling precise osteotomies while minimizing damage to adjacent soft tissues and neurovascular structures.

2. Case Report

A 40-year-old male patient presented to our clinic requesting fixed prosthetic rehabilitation of the left posterior mandible. Clinical and radiographic examinations demonstrated significant vertical alveolar bone deficiency (Figures 1–3). Following treatment planning, segmental osteotomy was selected as the preferred augmentation technique before implant placement.

The procedure was performed under local anesthesia using a submarginal flap design. Osteotomy cuts were completed with a piezoelectric surgical device. The horizontal osteotomy was positioned approximately 5 mm superior to the inferior alveolar nerve. The mesial vertical osteotomy was made 3 mm distal to the adjacent tooth, while the distal vertical osteotomy was planned according to the intended implant position. After completion of the osteotomies, the bone segment was carefully mobilized and elevated to the planned vertical position.

Rigid fixation was achieved using two L-shaped titanium plates secured with seven monocortical screws (Figure 4). The interpositional defect created by segment mobilization was grafted with a 1:1 mixture of autogenous particulate bone and Maxxeus corticocancellous allograft (Solvita, Centennial, CO, USA) (Figure 5). Following graft placement, the surgical site was closed primarily (Figure 6). A postoperative panoramic radiograph confirmed satisfactory repositioning and stabilization of the bone segment (Figure 2).

3. Conclusion

The postoperative healing period was uneventful, and excellent stability of the repositioned bone segment was maintained during follow-up. Segmental osteotomy combined with interpositional bone grafting is a predictable and effective technique for vertical ridge augmentation in patients with insufficient posterior mandibular bone height prior to implant placement. The use of piezoelectric surgery further enhances surgical accuracy and safety, contributing positively to treatment outcomes.

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Figure 4

Figure 2

Figure 3

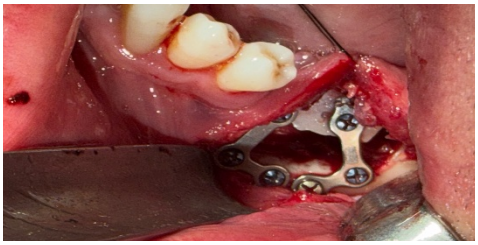

Figure 4

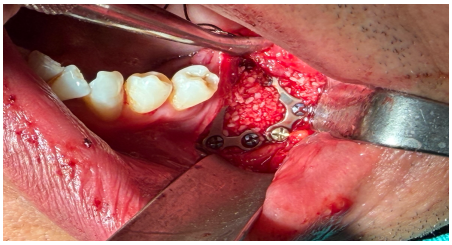

Figure 5

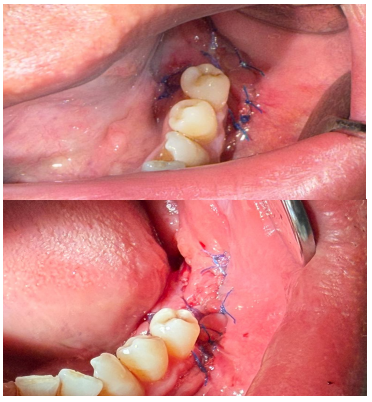

Figure 6

EP-056

Segmental Mandibular Reconstruction with a Non-Vascularized Iliac Crest Graft Following Resection of Mandibular Ossifying Fibroma: A Case Report

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Abstract

Objective: Ossifying fibroma (OF) is a benign fibro-osseous neoplasm characterized by progressive replacement of normal bone with fibrous connective tissue and varying degrees of mineralized material. Although conservative surgical treatment is generally sufficient for conventional lesions, selected extensive lesions may require segmental mandibular resection and immediate reconstruction. This report presents the successful management of an extensive mandibular ossifying fibroma treated with segmental mandibular resection and immediate reconstruction using a non-vascularized iliac crest bone graft.

Case: A 38-year-old female patient presented with a painless swelling in the right mandibular body. Radiographic examination revealed a well-defined expansile lesion measuring 33.10 × 26.46 mm. Considering the lesion size and the anticipated risk of mandibular fracture after conservative surgery, segmental mandibular resection was performed. The resulting defect was immediately reconstructed using an autogenous non-vascularized iliac crest block graft. Histopathological examination confirmed the diagnosis of conventional ossifying fibroma. Following successful graft integration, two dental implants were placed into the reconstructed bone to rehabilitate the edentulous area. Clinical and radiographic follow-up demonstrated successful osseointegration of both implants without complications. No recurrence or graft-related complications were observed during the 18-month follow-up period.

Conclusion: Segmental mandibular resection followed by immediate reconstruction with a non-vascularized iliac crest graft represents a reliable treatment option for selected patients with extensive ossifying fibroma. Successful implant-supported rehabilitation further demonstrates the long-term functional stability of this reconstructive approach.

Keywords: Ossifying fibroma; Mandibular reconstruction; Iliac crest graft

1. Introduction

Ossifying fibroma (OF) is a benign fibro-osseous neoplasm characterized by the replacement of normal bone with fibrous connective tissue containing varying amounts of mineralized material. According to the 2022 World Health Organization (WHO) Classification of Head and Neck Tumours, conventional OF is classified as a benign mesenchymal odontogenic neoplasm arising predominantly in the tooth-bearing regions of the jaws (1).

OF predominantly affects women during the second to fourth decades of life and most frequently involves the mandibular premolar-molar region (2,3). Radiographically, it usually appears as a well-defined lesion

with variable internal radiopacity depending on the degree of mineralization. Although conservative surgery is the preferred treatment for most conventional lesions, extensive tumors associated with marked cortical expansion or a high risk of pathological fracture may require segmental mandibular resection followed by immediate reconstruction (2,4–6).

Non-vascularized autogenous iliac crest grafts remain a reliable reconstructive option for selected benign mandibular defects because they provide sufficient corticocancellous bone volume, favorable biological properties, and predictable functional outcomes (7–9). This report describes the successful management of an extensive mandibular ossifying fibroma treated with segmental mandibular resection, immediate reconstruction using a non-vascularized iliac crest graft, and subsequent implant-supported rehabilitation.

2. Case Report

A 38-year-old female patient was referred to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University, with a complaint of gradually increasing swelling on the right side of the mandible. The patient reported that the swelling had slowly enlarged over time without significant pain. Her medical history was non-contributory, and no systemic disease or previous maxillofacial surgery was reported.

Clinical examination revealed facial asymmetry caused by expansion of the right mandibular body. Intraoral examination demonstrated a firm swelling involving the right posterior mandible. The overlying oral mucosa appeared intact without ulceration or signs of infection. No cervical lymphadenopathy was detected.

Radiographic evaluation, including panoramic radiography and cone-beam computed tomography (CBCT), demonstrated a well-defined expansile lesion involving the right mandibular body. The lesion measured approximately 33 × 26 mm and exhibited a well-circumscribed border with significant buccolingual expansion of the mandibular cortex (Figure 1). The radiographic appearance was suggestive of a benign fibro-osseous lesion, and the differential diagnosis included ossifying fibroma, fibrous dysplasia, and cemento-osseous dysplasia.

An incisional biopsy was performed to establish the histopathological diagnosis prior to definitive surgical treatment. Histopathological examination of the biopsy specimen was consistent with conventional ossifying fibroma. Based on the biopsy findings, lesion size, and the anticipated compromise of mandibular continuity following tumor removal, segmental mandibular resection was planned.

Under general anesthesia, segmental resection of the affected mandibular body was performed with adequate surgical margins (Figure 2). Immediate reconstruction was carried out using an autogenous non-vascularized iliac crest block graft harvested from the iliac crest. The graft was adapted to the mandibular defect and rigidly stabilized to restore mandibular continuity and facial contour (Figure 3).

Histopathological examination of the resected specimen demonstrated a cellular fibrous stroma containing irregular trabeculae of woven bone and cementum-like calcified structures, confirming the diagnosis of conventional ossifying fibroma (Figure 3).

The postoperative course was uneventful. Clinical and radiographic follow-up demonstrated satisfactory healing of both the donor and recipient sites. Progressive incorporation of the iliac crest graft was observed without evidence of infection, graft exposure, or significant graft resorption (Figure 4).

After complete graft maturation, prosthetic rehabilitation was initiated. Two endosseous dental implants were placed into the reconstructed iliac crest bone to restore the edentulous area. Clinical stability and radiographic evaluation confirmed successful osseointegration of both implants, allowing definitive prosthetic rehabilitation.

At the 18-month follow-up, the patient remained free of clinical or radiographic evidence of recurrence. Mandibular continuity was successfully maintained, satisfactory facial symmetry was achieved, and implant-supported prosthetic rehabilitation remained functional without biological or mechanical complications (Figure 5).

3. Discussion

The management of conventional ossifying fibroma depends on lesion size, anatomical location, cortical expansion, and preservation of mandibular continuity. Although conservative surgery is recommended for most conventional lesions because of their well-defined margins and low recurrence rate after complete excision, segmental resection may be indicated in extensive lesions associated with marked cortical destruction or an increased risk of pathological fracture (2,4,5).

Reconstruction of mandibular continuity is essential following segmental resection. Although vascularized free flaps are considered the gold standard for extensive mandibular defects, non-vascularized iliac crest grafts remain an effective alternative in carefully selected patients with benign lesions. These grafts provide abundant corticocancellous bone, lower donor-site morbidity, and adequate bone volume for future implant placement. In addition, they avoid the complexity and donor-site morbidity associated with microvascular reconstruction in appropriately selected patients (6–8).

A noteworthy aspect of the present case is the successful implant-supported rehabilitation after graft integration. Two dental implants achieved successful osseointegration without biological or mechanical complications, confirming the long-term stability of the reconstructed mandible. Furthermore, no recurrence or graft-related complications were observed during the 18-month follow-up period, supporting previous reports that complete excision combined with immediate reconstruction provides favorable long-term outcomes in extensive mandibular OF (2,5,7–9).

4. Conclusion

Although conservative surgery remains the treatment of choice for most conventional ossifying fibromas, extensive lesions may require segmental mandibular resection to achieve complete tumor removal and maintain long-term stability. The present case demonstrates that immediate reconstruction with a non-vascularized iliac crest graft, followed by implant-supported rehabilitation, can provide favorable functional and esthetic outcomes with no evidence of recurrence during follow-up.

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Figure 1: Preoperative CBCT images showing a well-defined expansile lesion in the right mandibular body.
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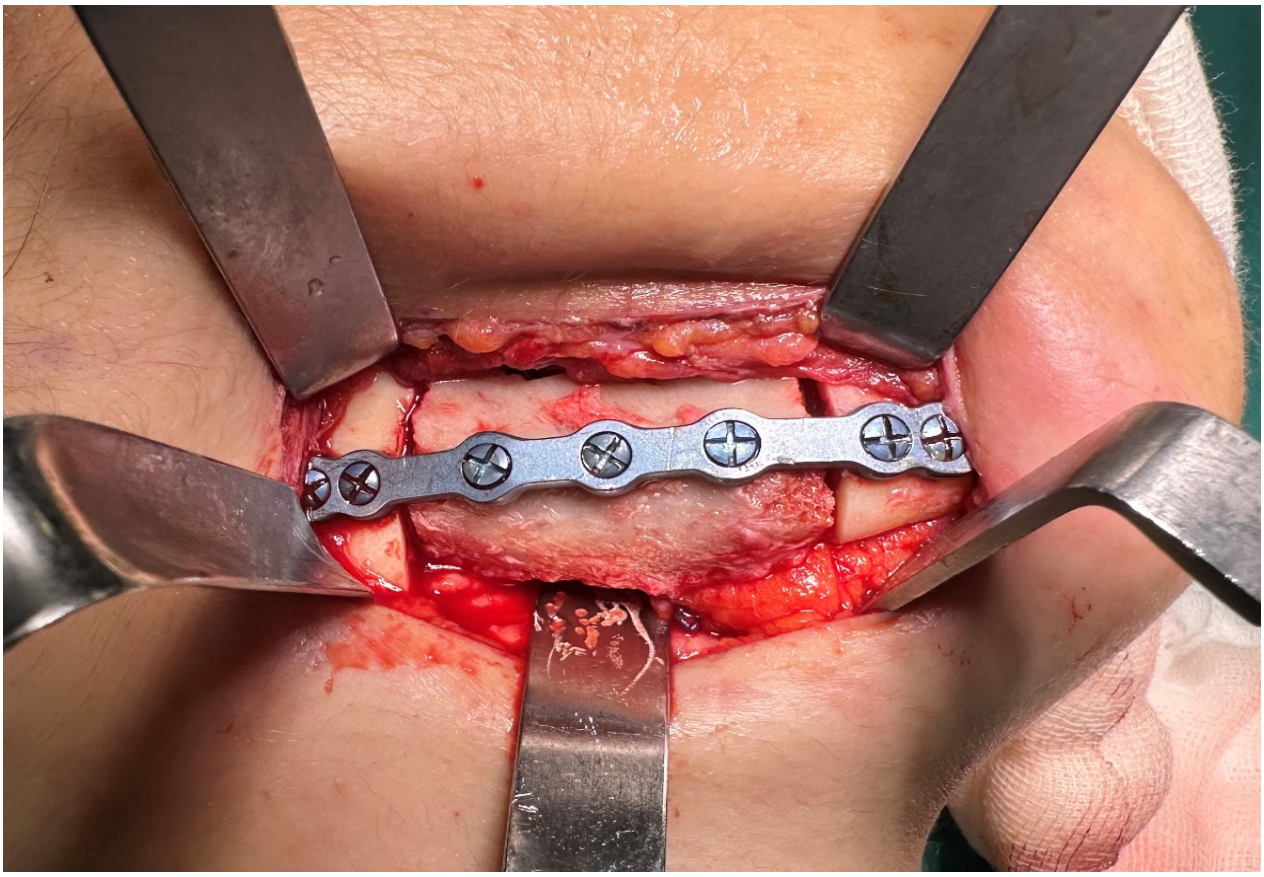

Figure 5: Intraoperative view following segmental mandibular resection and immediate reconstruction with a non-vascularized iliac crest bone graft.

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Figure 2: Intraoperative comparison of the resected mandibular specimen (right) and the autogenous non-vascularized iliac crest bone graft (left) prior to reconstruction.

Figure 6: Histopathological report confirming the diagnosis of ossifying fibroma

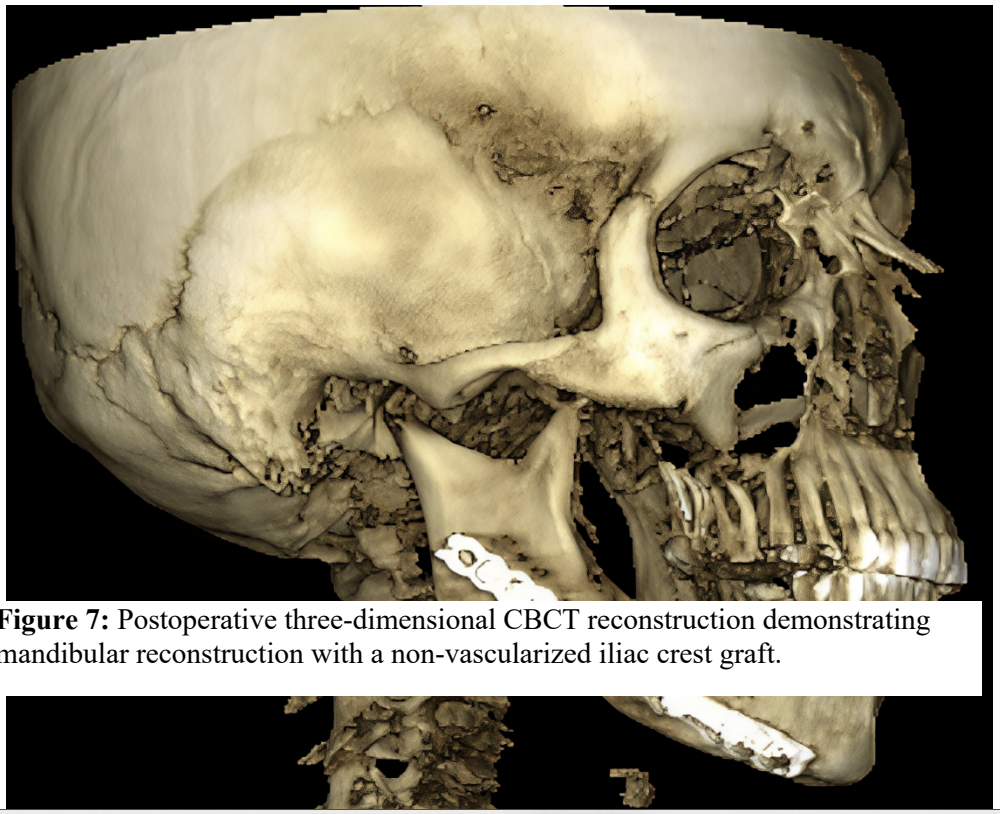

Figure 7: Postoperative three-dimensional CBCT reconstruction demonstrating mandibular reconstruction with a non-vascularized iliac crest graft.

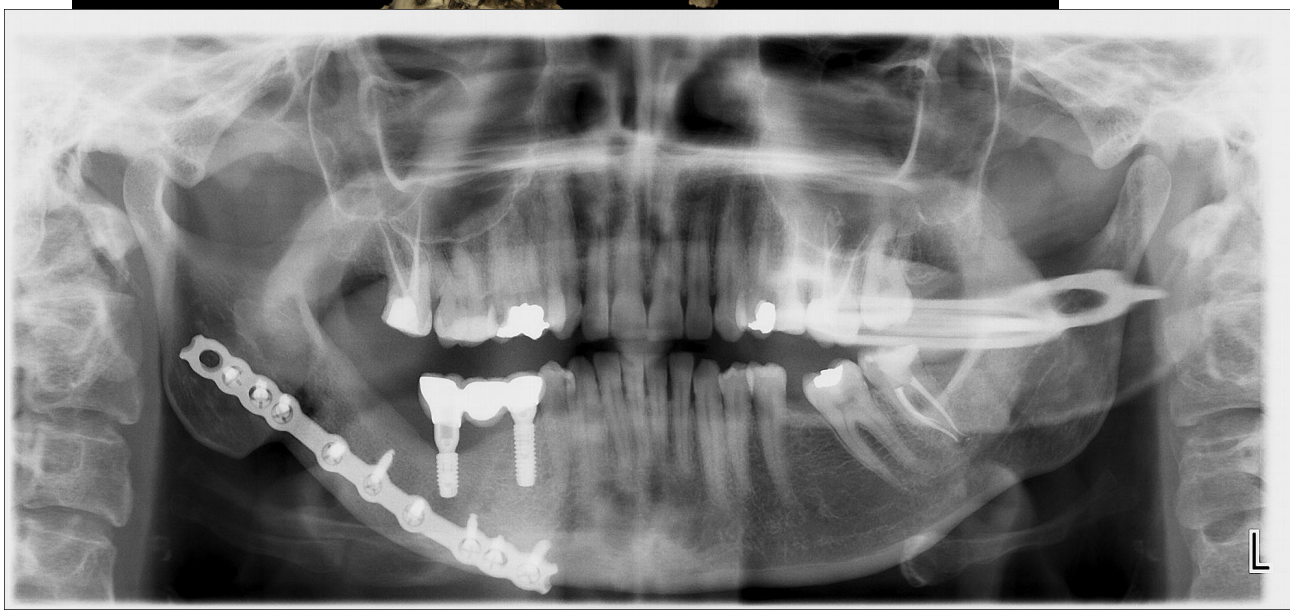

Figure 8: Postoperative panoramic radiograph demonstrating successful implant-supported rehabilitation

EP-060

Orthognathic Surgical Planning and Cephalometric Outcome Evaluation in an Acromegaly Patient with Mandibular Retrognathia: A Case Report

Acromegaly is a chronic endocrine disorder caused by excessive growth hormone secretion, leading to progressive craniofacial deformities. Mandibular retrognathia may occur depending on skeletal adaptation. Orthognathic surgery is indicated after endocrine stabilization to restore function and facial harmony.

A 21-year-old male patient with acromegaly secondary to pituitary adenoma presented with mandibular retrognathia, facial asymmetry, and malocclusion. Following endocrine stabilization, 20 months of orthodontic preparation was completed. Surgical treatment included Le Fort I osteotomy and bilateral sagittal split osteotomy.

Postoperative evaluation demonstrated significant improvement in skeletal relationships and facial profile. ANB values normalized. A transient anterior open bite was managed conservatively. No major complications were observed.

Orthognathic surgery is an effective treatment modality for correcting dentofacial deformities in acromegaly patients following endocrine stabilization. Precise planning and multidisciplinary collaboration are essential for optimal outcomes.

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EP-092

IMPLANT REHABILITATION WITH MAXILLARY SINUS AUGMENTATION AND URBAN GBR TECHNIQUE: A CASE REPORT

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Abstract

Objectives: Alveolar bone resorption and maxillary sinus pneumatization following tooth loss in the posterior maxilla complicate implant placement. Open sinus lifting and Guided Bone Regeneration (GBR) are reliable treatment options in such cases.

Case Report: A 53-year-old female patient presented for implant rehabilitation in the left posterior maxilla. Clinical and radiographic evaluation revealed significant vertical and horizontal bone deficiency. A lateral window sinus lift was performed under local anesthesia, and the Schneiderian membrane was carefully elevated. The sinus cavity was filled with graft material.

Simultaneously, bone augmentation was performed using the Urban GBR technique, and primary closure was achieved. After approximately 6 months of healing, sufficient bone volume was obtained and dental implants were placed. Radiographic evaluation confirmed increased bone height and volume, with proper implant positioning.

Conclusion: The combined use of open sinus lifting and Urban GBR techniques is an effective and reliable approach for implant rehabilitation in severely atrophic posterior maxilla cases.

Keywords: Sinus lift, GBR, implant, bone augmentation, posterior maxilla

1. Introduction

Loss of posterior maxillary teeth is frequently followed by alveolar bone resorption and maxillary sinus pneumatization, compromising implant placement. Lateral window sinus augmentation is a predictable technique for vertical bone gain, whereas the Urban GBR concept is widely used to reconstruct horizontal deficiencies by respecting the PASS principles of wound healing. Combining these procedures may reduce treatment stages while creating sufficient bone volume for implant placement.

2. Case report

A 53-year-old female with no systemic disease and no smoking history was referred for implant rehabilitation of the left posterior maxilla. Clinical and radiographic examination revealed severe vertical and horizontal bone deficiency. Under local anesthesia, a full thickness mucoperiosteal flap was elevated. A lateral bony window was prepared with rotary burs and the Schneiderian membrane was elevated without perforation. The sinus cavity was filled with an alloplastic bone substitute. Cortical perforations were created and the deficient ridge was augmented following the Urban GBR protocol. A resorbable collagen membrane was stabilized with titanium fixation pins and tension-free primary closure was achieved. Healing was uneventful. Approximately six months later, adequate bone volume was observed radiographically and appropriately sized tapered titanium implants were placed successfully.

3. Discussion

The combination of sinus floor elevation and GBR is supported by current literature for the management of complex posterior maxillary defects. Preservation of membrane integrity, stable graft fixation and tension-free primary closure are considered essential factors for successful bone regeneration. The PASS principles described by Urban remain fundamental for predictable outcomes. In the present case, simultaneous vertical and horizontal augmentation resulted in sufficient bone volume for implant placement without postoperative complications.

4. Conclusion

Within the limitations of a single case report, simultaneous lateral window sinus augmentation and Urban GBR using an alloplastic graft provided satisfactory clinical and radiographic outcomes and enabled successful implant rehabilitation of the atrophic posterior maxilla.

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6. Figures

Figure 1: Pre-operative panoramic X-ray

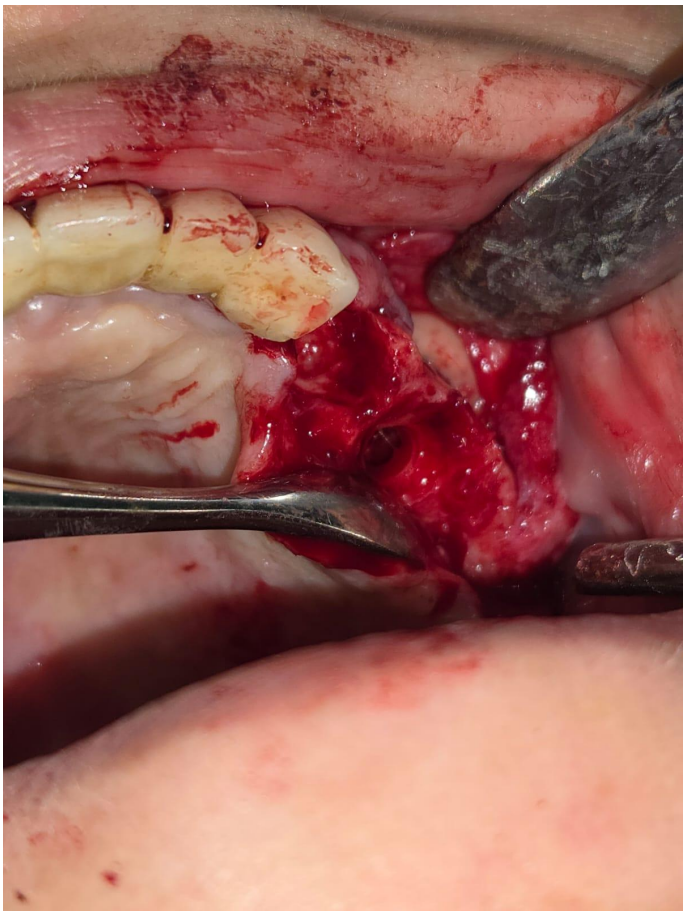

Figure 2: Left maxillary region pre-operative defective area

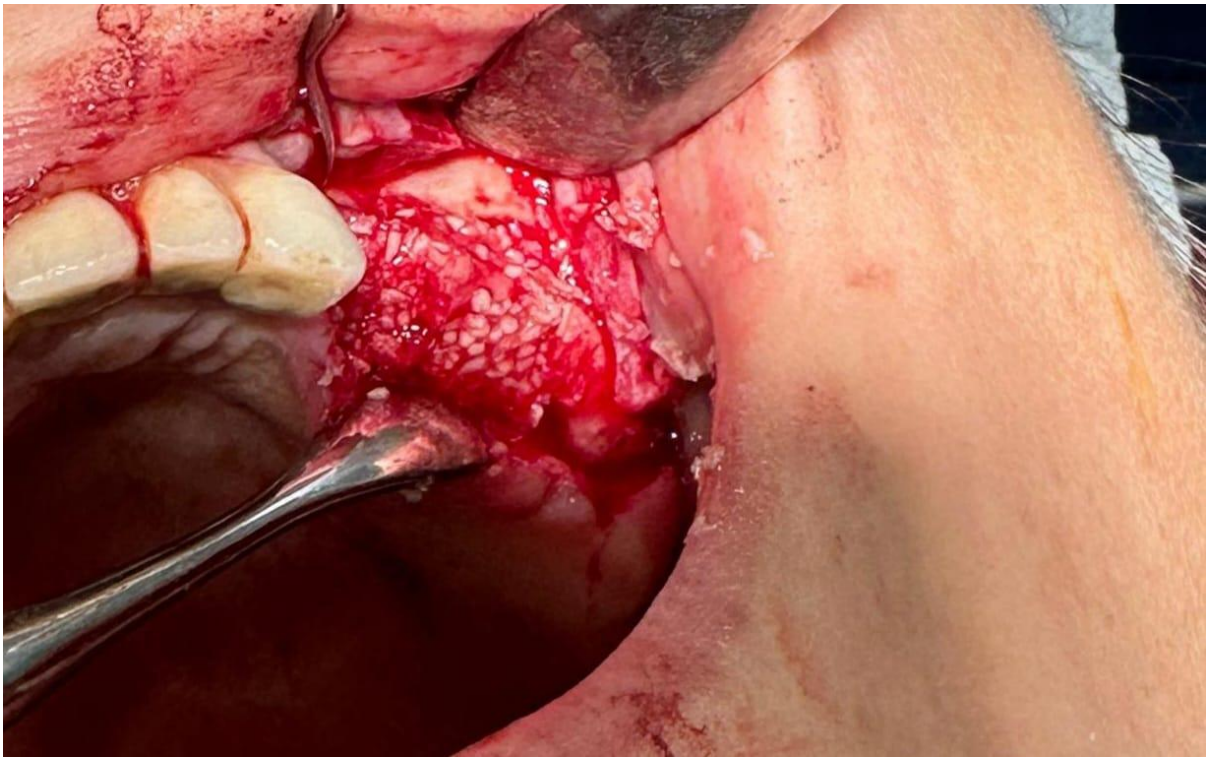

Figure 3: Bone augmentation procedure

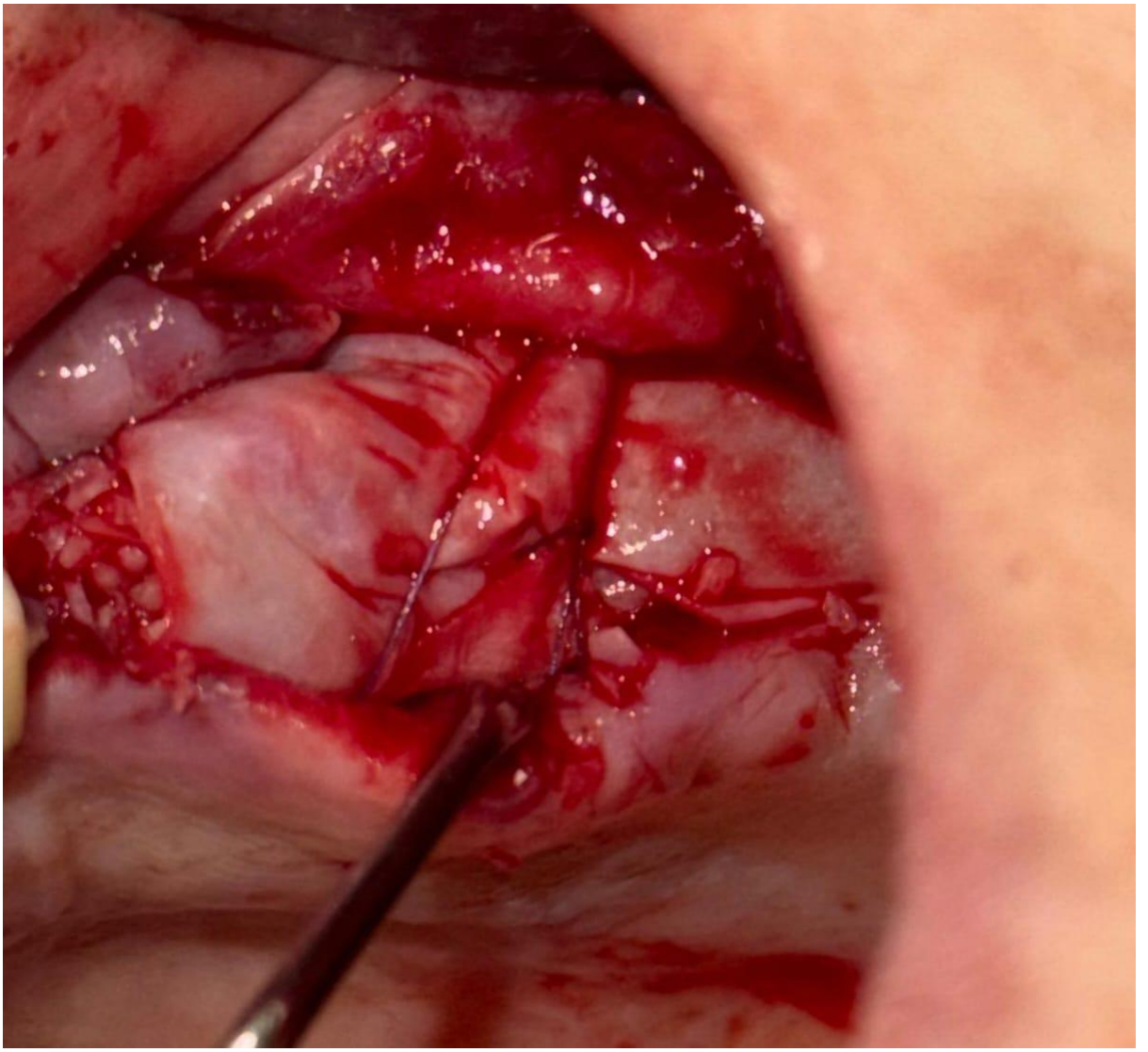

Figure 4: Membrane application using Urban technique.

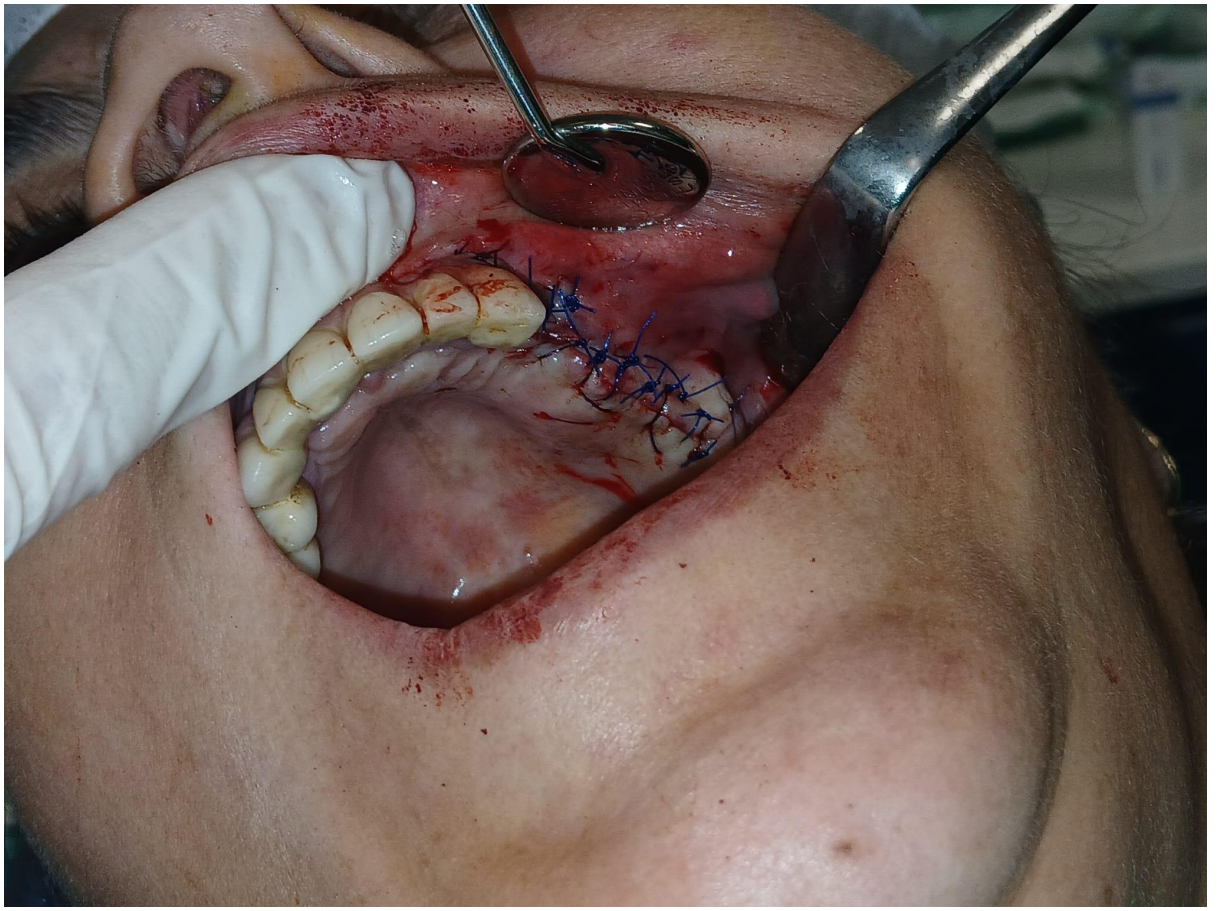

Figure 5: Closure of the relevant area

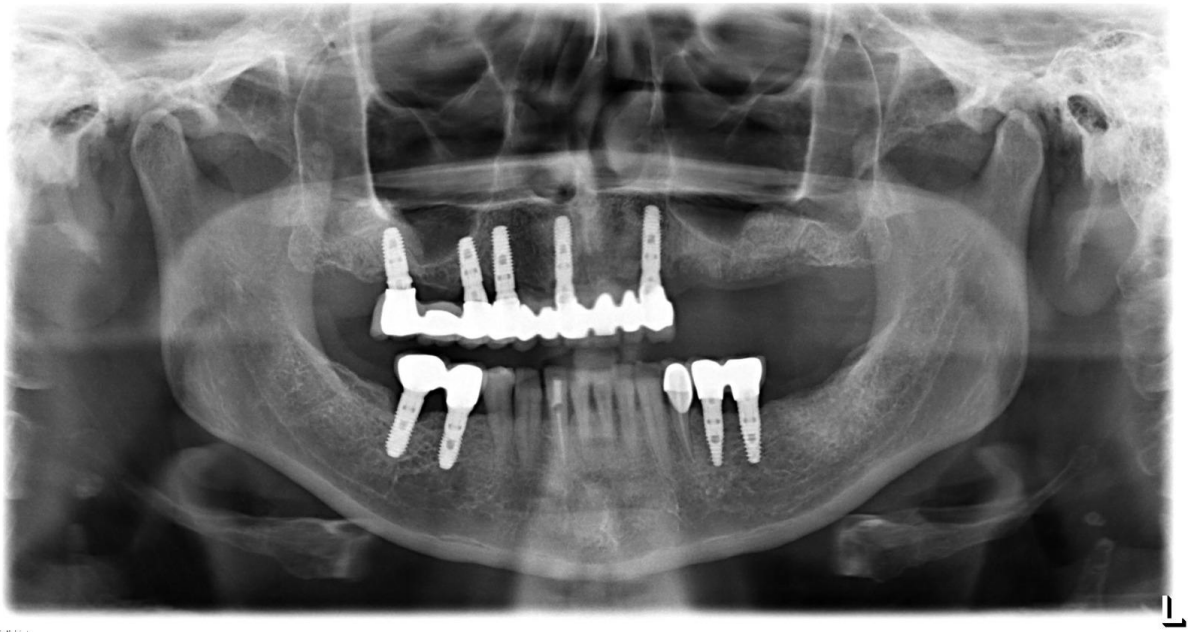

Figure 6: Panoramic X-ray image 6 months post-operatively.

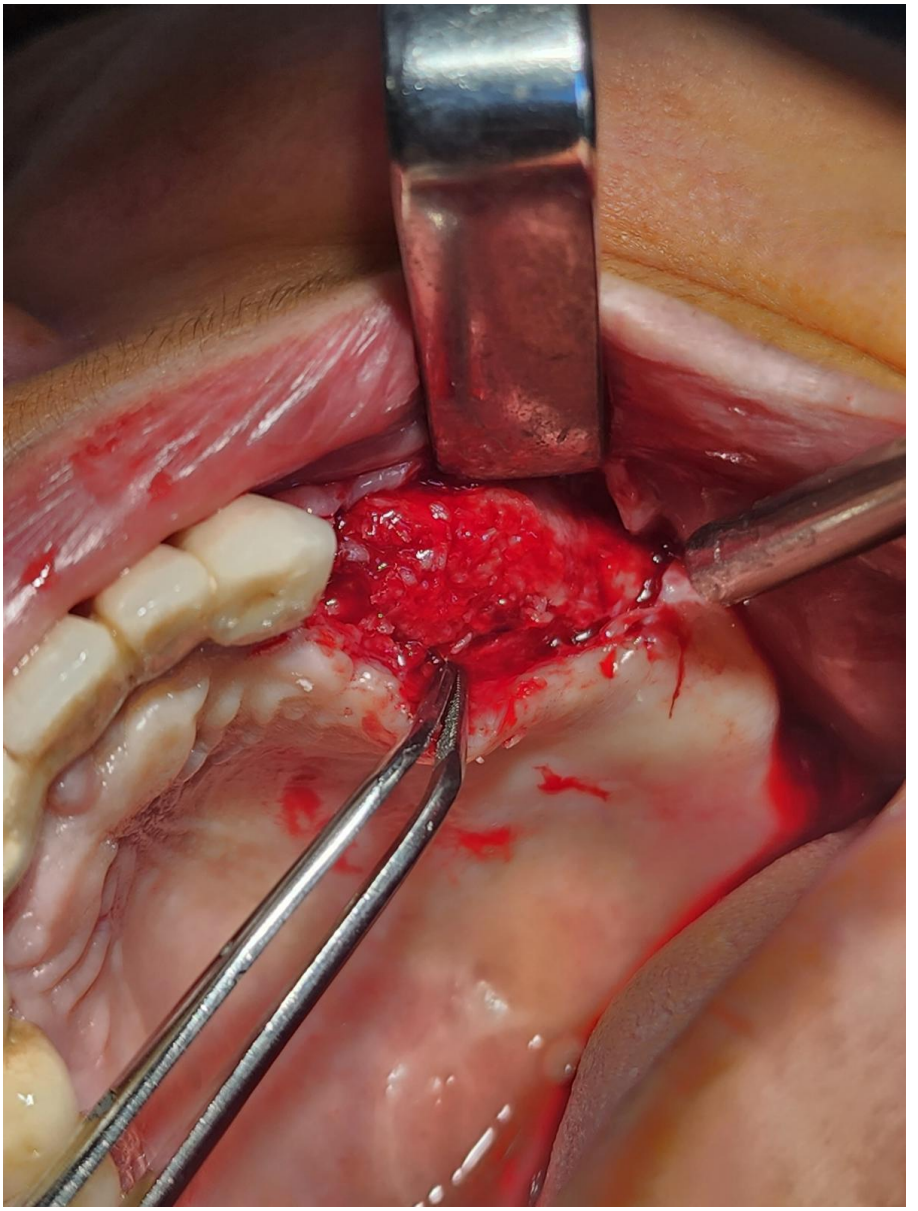

Figure 7: The appearance of the affected area 6 months post-operatively

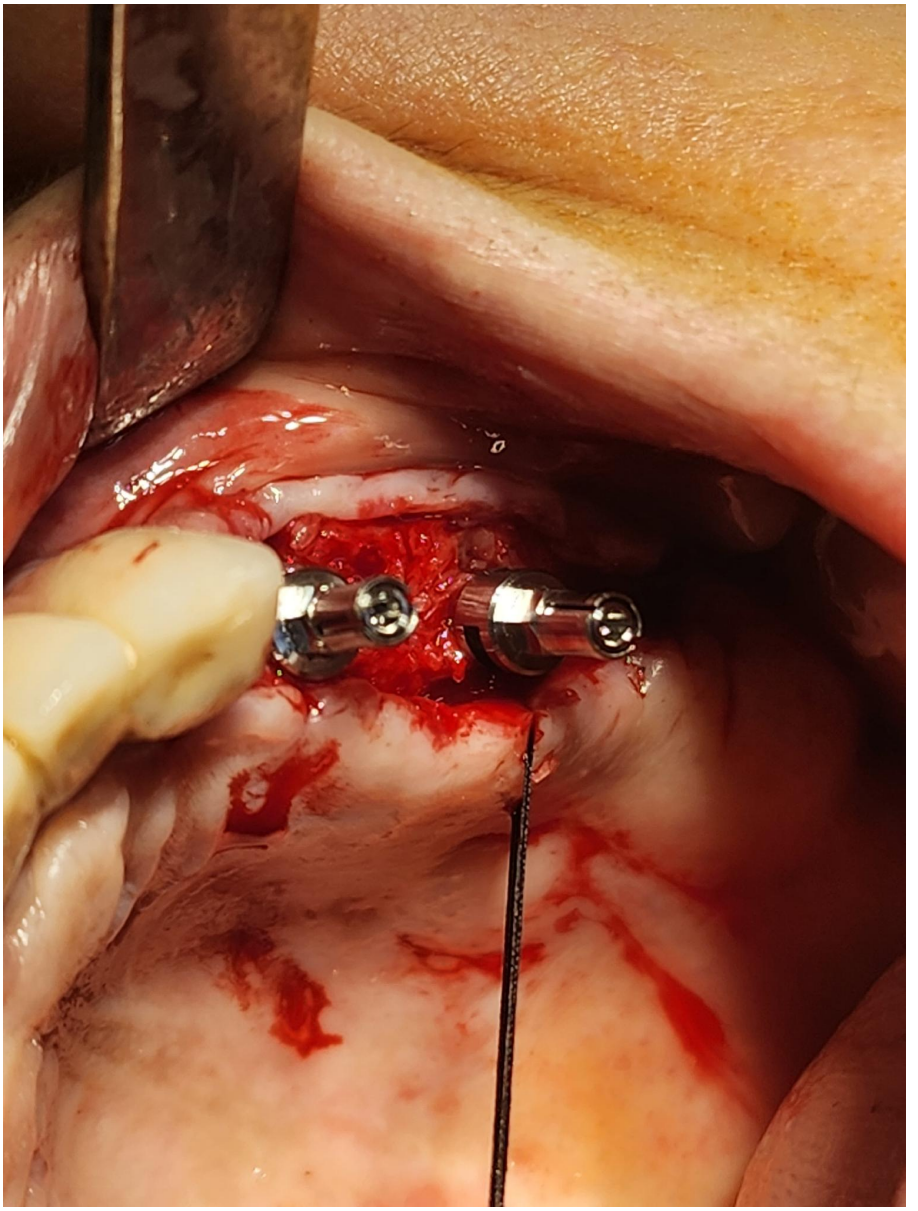

Figure 8: Placement of implants vertically and horizontally at the appropriate angles in the relevant area

Figure 9: Post-operative panoramic X-ray image

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EP-096

SURGICAL MANAGEMENT OF HORIZONTAL BONE DEFICIENCY IN THE ANTERIOR MANDIBLE: IMPLANT REHABILITATION USING POLYCAPROLACTONE (BLOOCEL®), STICKY BONE AND CORTICOCANCELLOUS GRAFT

Abstract
Objective: Horizontal alveolar ridge deficiency complicates implant rehabilitation and may compromise implant stability (1,2). This report presents horizontal augmentation using polycaprolactone (Bloocel®), sticky bone and corticocancellous graft.

Case: A 54-year-old female with anterior mandibular horizontal deficiency underwent CBCT evaluation. A Bloocel® scaffold was fixed with miniscrews. Sticky bone prepared from CGF and corticocancellous graft was placed between the scaffold and native bone. Three months later adequate ridge width allowed placement of two implants.

Conclusion: This combined technique provided successful ridge augmentation before implant placement, consistent with previous reports (1–4).

Keywords: Polycaprolactone; Guided Bone Regeneration; Dental Implant

1. Introduction
Horizontal ridge deficiencies frequently require guided bone regeneration before implant placement because inadequate bone width negatively affects implant stability (1,2). Polycaprolactone scaffolds have favorable biocompatibility and space-maintaining properties (4–6). Sticky bone enriched with CGF improves graft stability and bone regeneration (1–3).

2. Case Report
A 54-year-old female presented for fixed prosthetic rehabilitation of the anterior mandible. Clinical and CBCT examination revealed horizontal ridge deficiency. Bloocel® was stabilized with miniscrews. Sticky bone prepared using CGF and corticocancellous graft was applied between the scaffold and native bone. Primary closure was achieved. Three months later sufficient ridge width enabled placement of two implants.

3. Discussion
The combination of polycaprolactone scaffold, sticky bone and corticocancellous graft provided mechanical stability and biological support for bone regeneration, in agreement with previous studies (1–6). Polycaprolactone membranes maintain regenerative space while gradually degrading (4–6). CGF-enriched sticky bone enhances angiogenesis and graft maturation (1–3).

4. Conclusion
Polycaprolactone (Bloocel®) combined with sticky bone and corticocancellous graft appears to be a reliable option for horizontal ridge augmentation before implant placement (1–6).

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6. Evaluation of the Effectiveness of Biodegradable Polycaprolactone and Polyglycolic Acid Membranes in Guided Bone Regeneration. BMC Oral Health. 2026.

6.Figures

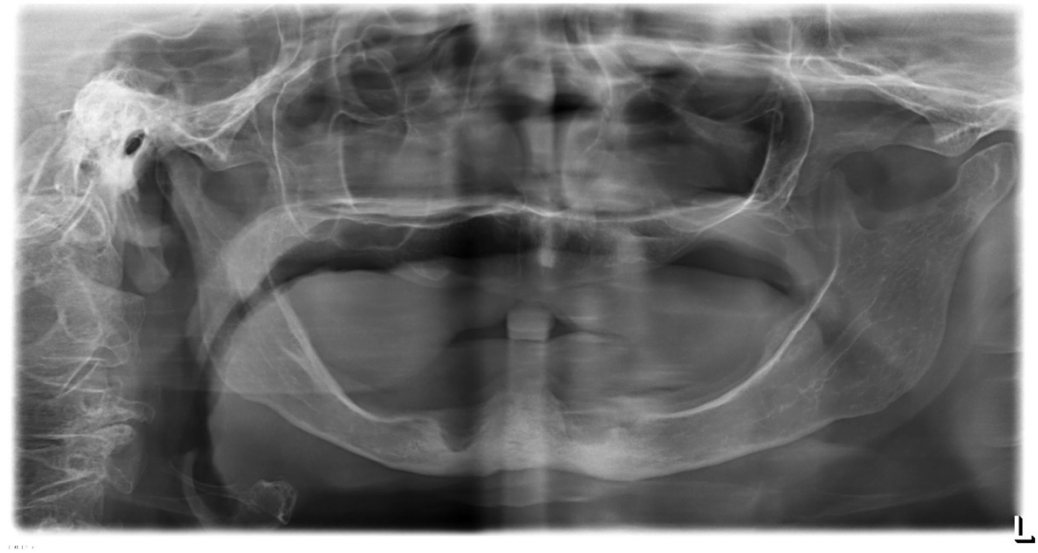

Figure 1. Preoperative panoramic radiograph.

Figure 2. Defect area.

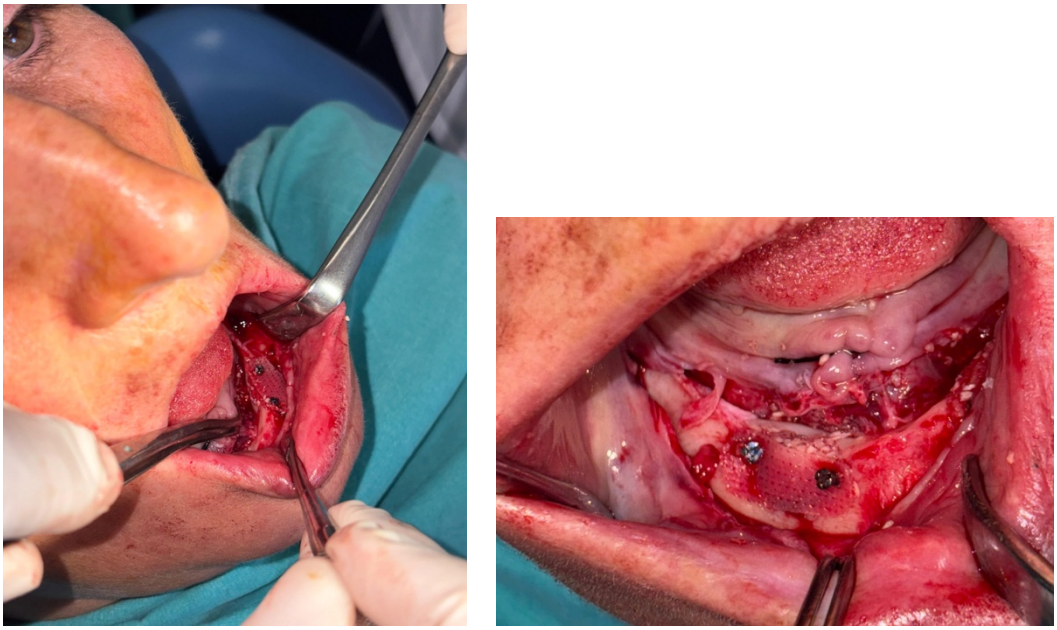

Figure 3-4. Sticky bone and graft placement.

Figure 5. Primary closure.

Figure 6. Three-month follow-up.

Figure 7. Postoperative panoramic radiograph.

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EP-097

MAKSİLLADA PAGET HASTALIĞI: OLGU SUNUMU

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Özet

Amaç: Maksillada kemik ekspansiyonu ile başvuran ve histopatolojik inceleme sonucunda Paget hastalığı tanısı alan olgunun tanı ve cerrahi tedavi sürecini sunmaktır.

Olgu: Altmış üç yaşındaki kadın hasta sağ posterior maksillada şişlik ve total protez uyumsuzluğu şikâyeti ile başvurdu. Klinik ve radyolojik değerlendirme sonrasında lokal anestezi altında tam kalınlık flep kaldırıldı. Piezo cerrahi yardımıyla ekspansiyon bölgesinden insizyonel biyopsi alındı ve kemik konturlaması gerçekleştirildi. Histopatolojik inceleme Paget hastalığı ile uyumlu bulundu. Hasta multidisipliner değerlendirme amacıyla ilgili bölümlere yönlendirildi.

Sonuç: İleri yaş hastalarda görülen çene kemiği ekspansiyonlarında Paget hastalığı ayırıcı tanıda mutlaka değerlendirilmelidir.

1. Giriş

Kemiğin Paget hastalığı (Paget's disease of bone, PDB), normal kemik remodelingi sürecinin bozulması sonucu gelişen, kronik ve progresif seyirli metabolik bir kemik hastalığıdır. Hastalıkta başlangıçta artmış osteoklastik kemik rezorpsiyonu görülmekte, bunu düzensiz ve aşırı osteoblastik kemik yapımı izlemektedir. Bu süreç sonucunda normal lameller kemik yerini yapısal olarak düzensiz, yüksek vaskülarizasyona sahip, hacmi artmış ancak mekanik dayanıklılığı azalmış mozaik paternli kemik dokusuna bırakmaktadır. Hastalık en sık pelvis, femur, vertebra ve kafatasını tutmakla birlikte, olguların yaklaşık %17–30'unda kraniyofasiyal kemikler etkilenmektedir. Maksillofasiyal bölge tutulumu nadir görülmekle birlikte, özellikle maksillada alveoler kemik ekspansiyonu, fasiyal asimetri, dişlerde yer değiştirme, maloklüzyon, total protez uyumsuzluğu ve estetik problemlere yol açabilmektedir. Klinik ve radyolojik bulguların fibroosseöz lezyonlar ile benzerlik göstermesi nedeniyle kesin tanı çoğu zaman histopatolojik değerlendirme ile konulmaktadır. Erken tanı ve multidisipliner yaklaşım, uygun cerrahi ve protetik tedavinin planlanması açısından büyük önem taşımaktadır (1–3).

2. Olgu Sunumu

Altmış üç yaşında kadın hasta sağ posterior maksillada uzun süredir devam eden şişlik ve total protezini kullanamama şikâyetiyle kliniğimize başvurdu. Klinik muayenede belirgin kemik ekspansiyonu izlendi (Resim 1). Panoramik radyografide ilgili bölgede yaygın radyoopak görünüm mevcuttu (Resim 2).

Lokal anestezi altında tam kalınlık mukoperiostal flep kaldırıldı ve ekspansiyon bölgesinden insizyonel biyopsi alındı (Resim 3). Ekspanse kemik piezo cerrahi sistemi ve osteotomlar yardımıyla şekillendirildi. Operasyon sırasında plak ile stabilizasyon sağlandı (Resim 4). Cerrahi alan uygun greft materyali ile desteklenerek primer kapatıldı (Resim 5-6).

Histopatolojik inceleme sonucunda düzensiz lameller kemik yapısı ve mozaik paterni izlenmiş olup Paget hastalığı tanısı doğrulandı. Hasta endokrinoloji ile konsülte edilerek düzenli klinik ve radyolojik takibe alındı.

3. Sonuç

Paget hastalığı çene kemiklerinde nadir görülmesine rağmen ileri yaş hastalarda gelişen kemik ekspansiyonlarının ayırıcı tanısında mutlaka düşünülmelidir. Klinik, radyolojik ve histopatolojik bulgular birlikte değerlendirilerek doğru tanıya ulaşılabilir. Erken tanı ve multidisipliner yaklaşım başarılı hasta yönetimi açısından önemlidir.

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PAGET'S DISEASE OF THE MAXILLA: A CASE REPORT

Abstract

Objective: To present the diagnostic and surgical management of a patient with maxillary bone expansion who was diagnosed with Paget's disease based on histopathological examination.

Case: A 63-year-old female patient presented with swelling in the right posterior maxilla and incompatibility of her complete denture. Following clinical and radiographic evaluation, a full-thickness mucoperiosteal flap was elevated under local anesthesia. An incisional biopsy was obtained from the expanded bone using piezosurgery, followed by surgical bone recontouring. Histopathological examination confirmed the diagnosis of Paget's disease. The patient was referred for multidisciplinary evaluation and systemic assessment.

Conclusion: Paget's disease should be considered in the differential diagnosis of jaw bone expansion, particularly in elderly patients.

Keywords: Paget's disease, maxilla, bone expansion

1. Introduction

Paget's disease of bone (PDB) is a chronic and progressive metabolic bone disorder characterized by disruption of normal bone remodeling. The disease is initially associated with excessive osteoclastic bone resorption, followed by increased but disorganized osteoblastic bone formation. Consequently, normal lamellar bone is replaced by structurally abnormal, highly vascularized woven bone with a characteristic mosaic pattern, resulting in enlarged but mechanically weakened bone. Although the pelvis, femur, vertebrae, and skull are the most commonly affected skeletal sites, craniofacial involvement has been reported in approximately 17–30% of cases. Maxillofacial involvement is relatively uncommon; however, when present, it may lead to alveolar bone expansion, facial asymmetry, tooth displacement, malocclusion, complete denture incompatibility, and aesthetic as well as functional impairment. Since the clinical and radiographic findings may mimic other fibro-osseous lesions, definitive diagnosis often requires histopathological examination. Early diagnosis and a multidisciplinary treatment approach are essential for appropriate surgical and prosthetic rehabilitation and for improving long-term patient outcomes (1–3).

2. Case Report

A 63-year-old female patient was referred to our clinic with complaints of progressive swelling in the right posterior maxilla and inability to use her complete denture. Clinical examination revealed a prominent bony expansion of the right posterior maxillary alveolar ridge (Figure 1). Panoramic radiographic examination demonstrated diffuse radiopaque changes associated with cortical expansion in the affected region (Figure 2).

Following clinical and radiographic evaluation, an incisional biopsy was planned under local anesthesia. A full-thickness mucoperiosteal flap was elevated, and an incisional biopsy was obtained from the expanded bone using piezosurgery (Figure 3). The expanded bone was subsequently recontoured with piezosurgery and osteotomes. Stabilization of the surgical site was achieved using fixation plates (Figure 4). The surgical defect was reconstructed with bone graft material, and primary wound closure was performed (Figures 5–6).

Histopathological examination revealed irregular lamellar bone trabeculae with a characteristic mosaic pattern, confirming the diagnosis of Paget's disease. The patient was referred to the Department of Endocrinology for systemic evaluation and was scheduled for regular clinical and radiographic follow-up.

3. Conclusion

Although Paget's disease rarely affects the jaws, it should always be considered in the differential diagnosis of jaw bone expansion in elderly patients. A definitive diagnosis requires correlation of clinical, radiographic, and histopathological findings. Early diagnosis and multidisciplinary management are essential for successful treatment planning and long-term patient care.

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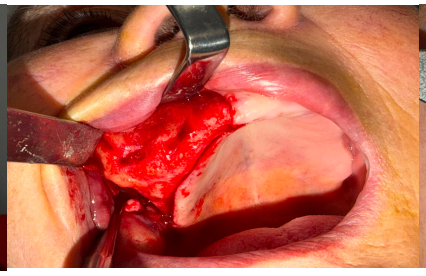
Figure 9



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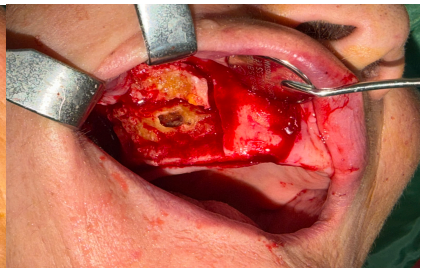

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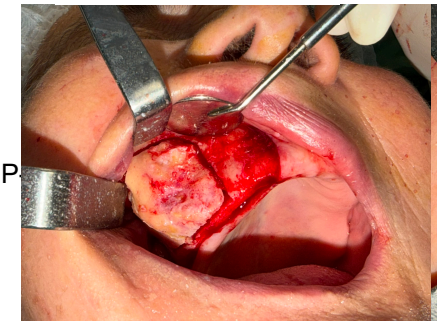

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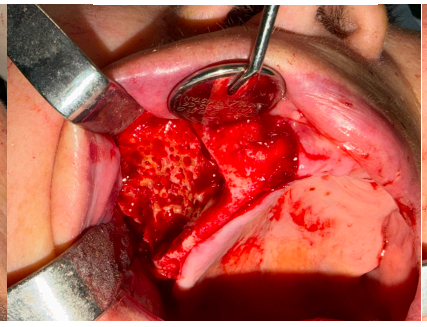

Figure 5

Figure 6

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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BLOOCELL İLE HORIZONTAL ALVEOLER KRET OGMENTASYONU: OLGU SUNUMU

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Özet

Amaç

Horizontal alveoler kret yetersizlikleri, özellikle bıçak sırtı (knife-edge) kret morfolojisine sahip olgularda implant yerleştirilmesini güçleştiren önemli anatomik problemlerdendir. İmplant tedavisi öncesinde yeterli kemik hacminin sağlanabilmesi amacıyla farklı ogmentasyon teknikleri uygulanmaktadır. Bu olgu sunumunda, Bloocell destekli yönlendirilmiş kemik rejenerasyonu ile horizontal alveoler kemik yetersizliğinin tedavisi sunulmuştur.

Olgu

Kırk beş yaşındaki kadın hasta, sol mandibula posterior bölgesine implant rehabilitasyonu amacıyla kliniğimize başvurdu. Klinik ve radyografik değerlendirmede vertikal kemik yüksekliğinin yeterli olduğu, ancak horizontal kemik genişliğinin yetersiz olduğu ve alveoler kretin bıçak sırtı morfolojisi gösterdiği belirlendi. Lokal anestezi altında tam kalınlık mukoperiostal flep kaldırıldı. Küçük rond frez ile dekortikasyon yapıldıktan sonra Bloocell materyali iki adet mikrovida ile sabitlendi. Hastadan elde edilen sticky PRP, 1 cc kortikokansellöz allogreft ile karıştırılarak mevcut kemik ile Bloocell arasındaki boşluğa yerleştirildi. Primer yara kapatılması sağlandı. Üç aylık iyileşme döneminin ardından yapılan ikinci cerrahide yeterli horizontal kemik kazanımı gözlendi ve aynı bölgeye iki adet dental implant başarıyla yerleştirildi.

Sonuç

Bloocell ile desteklenen horizontal alveoler kret ogmentasyonu, sticky PRP ve kortikokansellöz allogreft ile birlikte kullanıldığında implant öncesi horizontal kemik hacminin artırılmasında başarılı ve öngörülebilir bir tedavi seçeneği olarak değerlendirilebilir.

Anahtar Kelimeler: Horizontal kemik defekti, Bloocell, yönlendirilmiş kemik rejenerasyonu, PRP, dental implant

1. Giriş

Dental implant tedavisinin uzun dönem başarısı için yeterli alveoler kemik hacmi temel koşullardan biridir. Diş çekimini takiben meydana gelen fizyolojik kemik rezorpsiyonu özellikle horizontal yönde belirgin kemik kaybına neden olmakta ve alveoler kretin bıçak sırtı morfolojisi kazanmasına yol açabilmektedir. Bu durum implant yerleştirilmesini güçleştirmekte, ideal implant pozisyonunun elde edilmesini engellemekte ve estetik ile fonksiyonel sonuçları olumsuz etkileyebilmektedir. Bu nedenle implant cerrahisi öncesinde horizontal kemik ogmentasyonu sıklıkla gerekli olmaktadır (1).

Yönlendirilmiş kemik rejenerasyonu (GBR), horizontal alveoler kret genişliğinin artırılmasında günümüzde en sık kullanılan ve öngörülebilirliği kanıtlanmış tedavi yöntemlerinden biridir. Bariyer membranlar ile birlikte kemik greftlerinin kullanılması rejenerasyon alanının korunmasını sağlarken, son yıllarda geliştirilen biyouyumlu biyomateryaller ve otolog büyüme faktörleri kemik iyileşmesini desteklemektedir. Bloocell, kemik rejenerasyonu için geliştirilen biyouyumlu bir iskele materyali olup, greft materyalleri ve trombositten zengin plazma (PRP) ile birlikte kullanıldığında yeni kemik oluşumunu destekleyebilmektedir. Bu olgu sunumunda Bloocell destekli horizontal alveoler kret ogmentasyonu ile başarılı implant rehabilitasyonu gerçekleştirilen bir olgu sunulmaktadır (2,3).

2. Olgu Sunumu

Kırk beş yaşındaki kadın hasta, sol mandibula posterior bölgede implant tedavisi amacıyla kliniğimize başvurdu. Klinik ve panoramik radyografik değerlendirmede vertikal kemik yüksekliğinin yeterli olduğu, ancak horizontal kemik genişliğinin ileri derecede yetersiz olduğu ve alveoler kretin bıçak sırtı morfolojisi gösterdiği belirlendi (**Resim 1**).

Lokal anestezi altında tam kalınlık mukoperiostal flep kaldırıldı. Alıcı sahada revaskülarizasyonu artırmak amacıyla küçük rond frez yardımıyla kortikal dekortikasyon gerçekleştirildi (**Resim 2**). Daha sonra Bloocell materyali defekt bölgesine adapte edilerek iki adet titanyum mikrovida ile stabilize edildi (**Resim 3**).

Hastadan elde edilen otolog sticky PRP, 1 cc kortikokansellöz allogreft ile homojen şekilde karıştırıldı ve mevcut alveoler kemik ile Bloocell arasındaki boşluğu tamamen dolduracak şekilde yerleştirildi (**Resim 4**). Flep gerilimsiz olarak ilerletildi ve primer yara kapatılması kesintili sütürlerle sağlandı (**Resim 5**).

Yaklaşık üç aylık iyileşme döneminin ardından ikinci cerrahi gerçekleştirildi. Cerrahi eksplorasyonda horizontal alveoler kret genişliğinde yeterli kemik kazanımı elde edildiği gözlendi ve aynı bölgeye iki adet dental implant yeterli primer stabilite ile başarıyla yerleştirildi. Postoperatif iyileşme komplikasyonsuz tamamlandı ve hasta protetik rehabilitasyon amacıyla takip programına alındı.

3. Sonuç

Bloocell destekli yönlendirilmiş kemik rejenerasyonu, sticky PRP ve kortikokansellöz allogreft ile birlikte uygulandığında horizontal alveoler kemik yetersizliklerinin tedavisinde güvenilir ve öngörülebilir bir seçenek olarak değerlendirilebilir. Daha geniş örneklem grupları ve uzun dönem klinik takip çalışmalarına ihtiyaç duyulmakla birlikte, bu yaklaşım implant tedavisi öncesinde başarılı kemik hacmi kazanımı sağlayabilecek etkili bir alternatif olarak görünmektedir.

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HORIZONTAL ALVEOLAR RIDGE AUGMENTATION WITH BLOOCELL: A CASE REPORT

Elshan Allahverdiyev[1], Ahmet Yay[1], Helin Merve Özalp[1], Onur Yılmaz[1]

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Abstract

Objective

Horizontal alveolar ridge deficiencies, particularly knife-edge ridge deformities, frequently complicate implant placement due to insufficient bone width. Various augmentation techniques have been proposed to reconstruct these defects before implant surgery. This report presents the clinical management of a horizontal alveolar ridge deficiency using Bloocell supported guided bone regeneration.

Case

A 45-year-old female patient was referred for implant rehabilitation in the left posterior mandible. Clinical and radiographic examination revealed adequate vertical bone height but severe horizontal bone deficiency with a knife-edge ridge configuration. Following full-thickness flap elevation under local anesthesia, cortical perforations were created using a round bur. A Bloocell membrane was stabilized with two microscrews over the defect. Platelet-rich plasma (sticky PRP) prepared from the patient's blood was mixed with 1 cc cortico-cancellous allograft and placed between the native bone and the Bloocell scaffold. Primary wound closure was achieved without tension. After a three-month healing period, re-entry surgery demonstrated satisfactory horizontal ridge augmentation, allowing placement of two dental implants with adequate primary stability.

Conclusion

Bloocell-supported horizontal ridge augmentation combined with sticky PRP and cortico-cancellous allograft appears to be a predictable and effective technique for reconstruction of horizontal alveolar deficiencies prior to implant placement.

Keywords: Horizontal ridge defect, Bloocell, guided bone regeneration, PRP, dental implant

1. Introduction

Adequate alveolar bone volume is one of the major prerequisites for successful implant-supported rehabilitation. Horizontal ridge deficiencies are frequently encountered following tooth loss and are characterized by a knife-edge ridge morphology that limits implant placement. Guided bone regeneration (GBR) remains one of the most predictable approaches for increasing alveolar ridge width before implant surgery. The use of barrier membranes together with bone graft materials enhances osteoconduction while maintaining the regenerative space. Recently, Bloocell has been introduced as a biocompatible regenerative scaffold that facilitates bone regeneration when combined with graft materials and autologous biologic agents such as platelet-rich plasma (PRP). This report describes the clinical management of a severe horizontal ridge deficiency using Bloocell-supported augmentation prior to implant placement.

2. Case Report

A 45-year-old female patient presented to our clinic for implant rehabilitation of the left posterior mandible. Clinical and radiographic examinations demonstrated adequate vertical bone height but insufficient horizontal ridge width with a pronounced knife-edge morphology (Figure 1).

Following administration of local anesthesia, a full-thickness mucoperiosteal flap was elevated. Cortical perforations were created with a small round bur to enhance bleeding and improve graft vascularization (Figure 2). A Bloocell scaffold was adapted to the recipient site and stabilized using two titanium microscrews (Figure 3).

Autologous sticky PRP was prepared from the patient's peripheral blood and mixed with 1 cc of cortico-cancellous allograft. The graft mixture was placed between the native alveolar bone and the Bloocell scaffold to completely fill the horizontal defect (Figure 4). After graft placement, the flap was advanced and primary tension-free closure was achieved using interrupted sutures (Figure 5).

Three months later, re-entry surgery demonstrated successful horizontal ridge augmentation with sufficient bone width for implant placement. Two dental implants were inserted into the augmented site with satisfactory primary stability. Healing was uneventful, and prosthetic rehabilitation was subsequently planned.

3. Conclusion

Bloocell-supported guided bone regeneration combined with sticky PRP and cortico-cancellous allograft may represent a reliable treatment option for reconstruction of horizontal alveolar ridge deficiencies before implant placement. Further clinical studies with larger patient populations and long-term follow-up are required to confirm its effectiveness.

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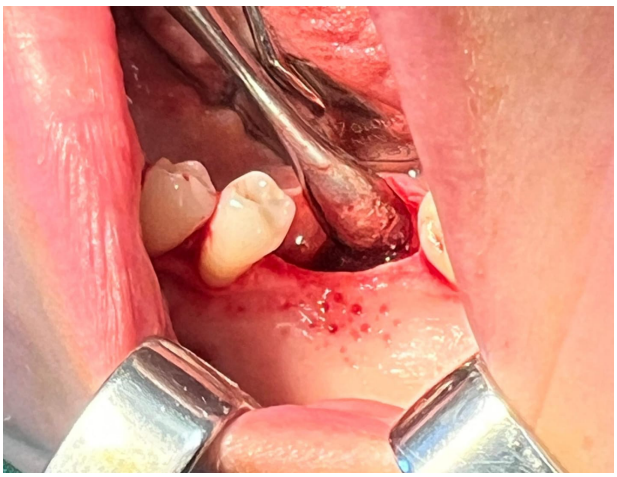


Figure 10

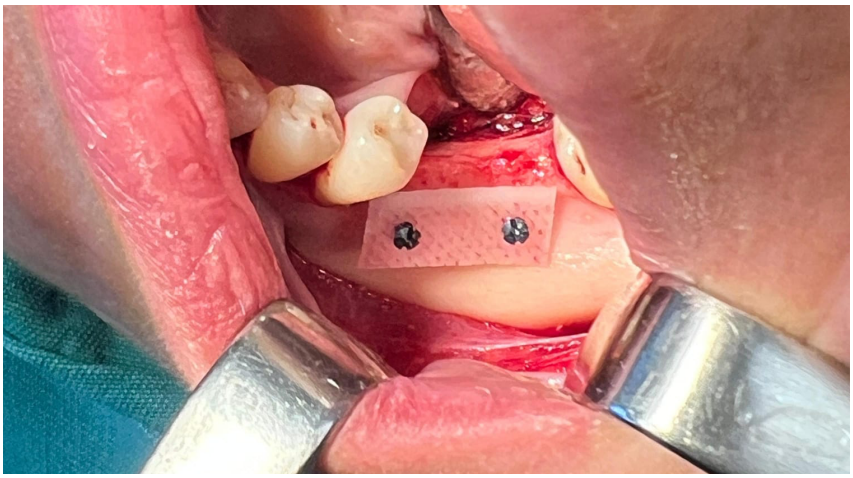
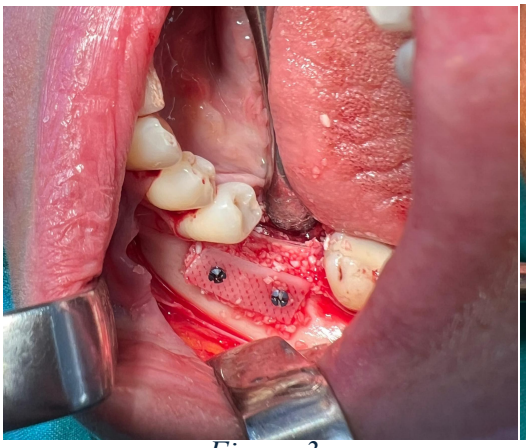


Figure 2



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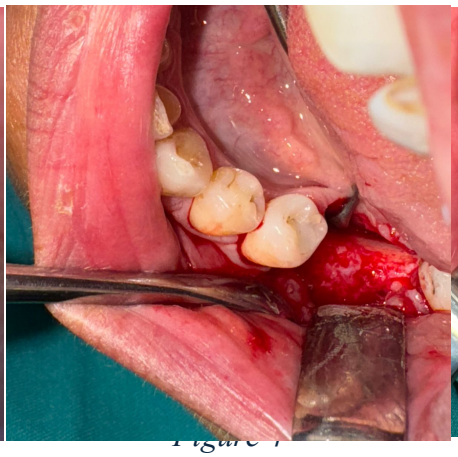

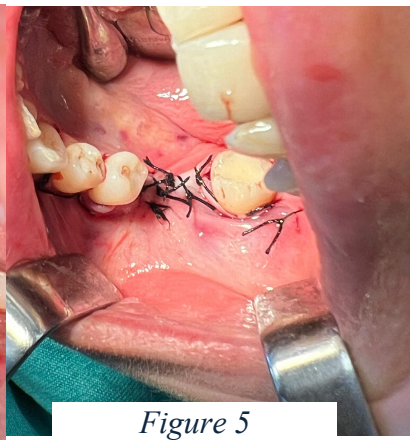

Figure 5

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Olgu

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Sonuç

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1. Giriş

Dental implant tedavisinin uzun dönem başarısı için yeterli alveoler kemik hacmi temel koşullardan biridir. Diş çekimini takiben meydana gelen fizyolojik kemik rezorpsiyonu özellikle horizontal yönde belirgin kemik kaybına neden olmakta ve alveoler kretin bıçak sırtı morfolojisi kazanmasına yol açabilmektedir. Bu durum implant yerleştirilmesini güçleştirmekte, ideal implant pozisyonunun elde edilmesini engellemekte ve estetik ile fonksiyonel sonuçları olumsuz etkileyebilmektedir. Bu nedenle implant cerrahisi öncesinde horizontal kemik ogmentasyonu sıklıkla gerekli olmaktadır (1).

Yönlendirilmiş kemik rejenerasyonu (GBR), horizontal alveoler kret genişliğinin artırılmasında günümüzde en sık kullanılan ve öngörülebilirliği kanıtlanmış tedavi yöntemlerinden biridir. Bariyer membranlar ile birlikte kemik greftlerinin kullanılması rejenerasyon alanının korunmasını sağlarken, son yıllarda geliştirilen biyouyumlu biyomateryaller ve otolog büyüme faktörleri kemik iyileşmesini desteklemektedir. Bloocell, kemik rejenerasyonu için geliştirilen biyouyumlu bir iskele materyali olup, greft materyalleri ve trombositten zengin plazma (PRP) ile birlikte kullanıldığında yeni kemik oluşumunu destekleyebilmektedir. Bu olgu sunumunda Bloocell destekli horizontal alveoler kret ogmentasyonu ile başarılı implant rehabilitasyonu gerçekleştirilen bir olgu sunulmaktadır (2,3).

2. Olgu Sunumu

Kırk beş yaşındaki kadın hasta, sol mandibula posterior bölgede implant tedavisi amacıyla kliniğimize başvurdu. Klinik ve panoramik radyografik değerlendirmede vertikal kemik yüksekliğinin yeterli olduğu, ancak horizontal kemik genişliğinin ileri derecede yetersiz olduğu ve alveoler kretin bıçak sırtı morfolojisi gösterdiği belirlendi (**Resim 1**).

Lokal anestezi altında tam kalınlık mukoperiostal flep kaldırıldı. Alıcı sahada revaskülarizasyonu artırmak amacıyla küçük rond frez yardımıyla kortikal dekortikasyon gerçekleştirildi (**Resim 2**). Daha sonra Bloocell materyali defekt bölgesine adapte edilerek iki adet titanyum mikrovida ile stabilize edildi (**Resim 3**).

Hastadan elde edilen otolog sticky PRP, 1 cc kortikokansellöz allogreft ile homojen şekilde karıştırıldı ve mevcut alveoler kemik ile Bloocell arasındaki boşluğu tamamen dolduracak şekilde yerleştirildi (**Resim 4**). Flep gerilimsiz olarak ilerletildi ve primer yara kapatılması kesintili sütürlerle sağlandı (**Resim 5**).

Yaklaşık üç aylık iyileşme döneminin ardından ikinci cerrahi gerçekleştirildi. Cerrahi eksplorasyonda horizontal alveoler kret genişliğinde yeterli kemik kazanımı elde edildiği gözlendi ve aynı bölgeye iki adet dental implant yeterli primer stabilite ile başarıyla yerleştirildi. Postoperatif iyileşme komplikasyonsuz tamamlandı ve hasta protetik rehabilitasyon amacıyla takip programına alındı.

3. Sonuç

Bloocell destekli yönlendirilmiş kemik rejenerasyonu, sticky PRP ve kortikokansellöz allogreft ile birlikte uygulandığında horizontal alveoler kemik yetersizliklerinin tedavisinde güvenilir ve öngörülebilir bir seçenek olarak değerlendirilebilir. Daha geniş örneklem grupları ve uzun dönem klinik takip çalışmalarına ihtiyaç duyulmakla birlikte, bu yaklaşım implant tedavisi öncesinde başarılı kemik hacmi kazanımı sağlayabilecek etkili bir alternatif olarak görünmektedir.

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HORIZONTAL ALVEOLAR RIDGE AUGMENTATION WITH BLOOCELL: A CASE REPORT

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Abstract

Objective

Horizontal alveolar ridge deficiencies, particularly knife-edge ridge deformities, frequently complicate implant placement due to insufficient bone width. Various augmentation techniques have been proposed to reconstruct these defects before implant surgery. This report presents the clinical management of a horizontal alveolar ridge deficiency using Bloocell supported guided bone regeneration.

Case

A 45-year-old female patient was referred for implant rehabilitation in the left posterior mandible. Clinical and radiographic examination revealed adequate vertical bone height but severe horizontal bone deficiency with a knife-edge ridge configuration. Following full-thickness flap elevation under local anesthesia, cortical perforations were created using a round bur. A Bloocell membrane was stabilized with two microscrews over the defect. Platelet-rich plasma (sticky PRP) prepared from the patient's blood was mixed with 1 cc cortico-cancellous allograft and placed between the native bone and the Bloocell scaffold. Primary wound closure was achieved without tension. After a three-month healing period, re-entry surgery demonstrated satisfactory horizontal ridge augmentation, allowing placement of two dental implants with adequate primary stability.

Conclusion

Bloocell-supported horizontal ridge augmentation combined with sticky PRP and cortico-cancellous allograft appears to be a predictable and effective technique for reconstruction of horizontal alveolar deficiencies prior to implant placement.

Keywords: Horizontal ridge defect, Bloocell, guided bone regeneration, PRP, dental implant

1. Introduction

Adequate alveolar bone volume is one of the major prerequisites for successful implant-supported rehabilitation. Horizontal ridge deficiencies are frequently encountered following tooth loss and are characterized by a knife-edge ridge morphology that limits implant placement. Guided bone regeneration (GBR) remains one of the most predictable approaches for increasing alveolar ridge width before implant surgery. The use of barrier membranes together with bone graft materials enhances osteoconduction while maintaining the regenerative space. Recently, Bloocell has been introduced as a biocompatible regenerative scaffold that facilitates bone regeneration when combined with graft materials and autologous biologic agents such as platelet-rich plasma (PRP). This report describes the clinical management of a severe horizontal ridge deficiency using Bloocell-supported augmentation prior to implant placement.

2. Case Report

A 45-year-old female patient presented to our clinic for implant rehabilitation of the left posterior mandible. Clinical and radiographic examinations demonstrated adequate vertical bone height but insufficient horizontal ridge width with a pronounced knife-edge morphology (Figure 1).

Following administration of local anesthesia, a full-thickness mucoperiosteal flap was elevated. Cortical perforations were created with a small round bur to enhance bleeding and improve graft vascularization (Figure 2). A Bloocell scaffold was adapted to the recipient site and stabilized using two titanium microscrews (Figure 3).

Autologous sticky PRP was prepared from the patient's peripheral blood and mixed with 1 cc of cortico-cancellous allograft. The graft mixture was placed between the native alveolar bone and the Bloocell scaffold to completely fill the horizontal defect (Figure 4). After graft placement, the flap was advanced and primary tension-free closure was achieved using interrupted sutures (Figure 5).

Three months later, re-entry surgery demonstrated successful horizontal ridge augmentation with sufficient bone width for implant placement. Two dental implants were inserted into the augmented site with satisfactory primary stability. Healing was uneventful, and prosthetic rehabilitation was subsequently planned.

3. Conclusion

Bloocell-supported guided bone regeneration combined with sticky PRP and cortico-cancellous allograft may represent a reliable treatment option for reconstruction of horizontal alveolar ridge deficiencies before implant placement. Further clinical studies with larger patient populations and long-term follow-up are required to confirm its effectiveness.

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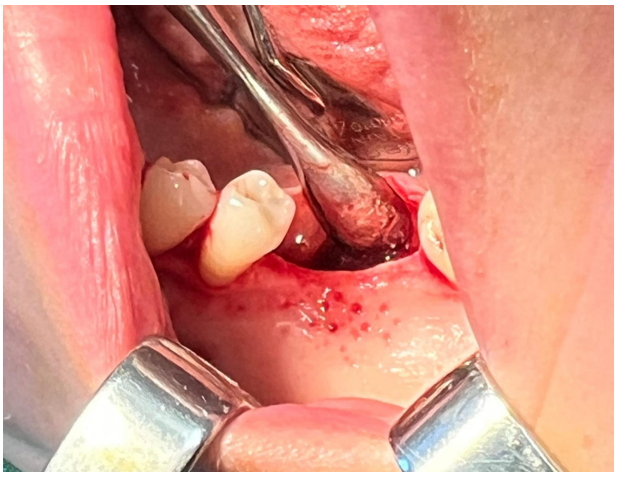
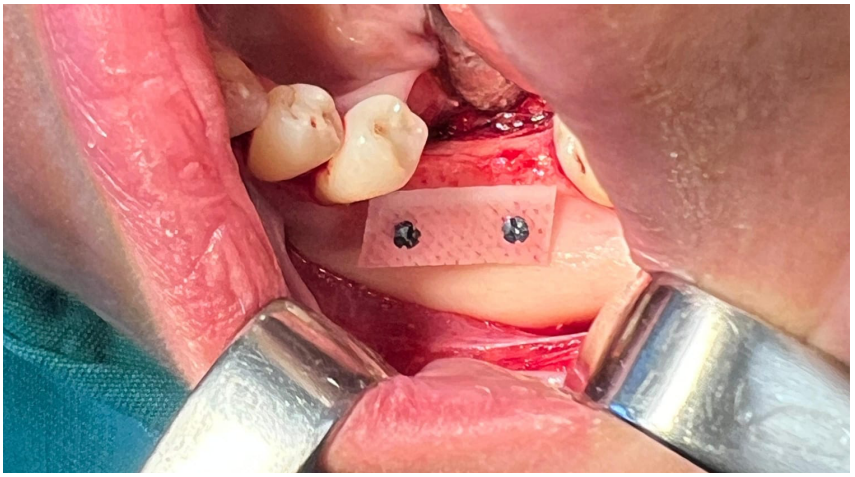

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TREATMENT OF A PERSİSTENT OROANTRAL COMMUNİCATİON FOLLOWİNG FAİLED BUCCAL FAT PAD FLAP USİNG A PALATAL ISLAND FLAP: A CASE REPORT

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Abstract

Objective: An abnormal communication between the maxillary sinus and the oral cavity is defined as an oroantral communication and typically occurs as a result of oral surgical complications. Numerous techniques have been described for the closure of oroantral communications. In this case, an oroantral fistula treated using the palatal island flap technique is presented.

Case report: A 78-year-old patient developed an oroantral communication following the extraction of tooth #17 in our clinic. The communication was initially managed using the buccal fat pad technique; however, clinical follow-up revealed that closure was unsuccessful. Therefore, the palatal island flap technique was selected for closure. Routine postoperative follow-up examinations demonstrated reliable closure of the oroantral communication.

Conclusion: The palatal island flap technique enables successful closure of the defect while preserving adequate blood supply and without reducing the depth of the maxillary buccal vestibule. This case demonstrates that the palatal island flap technique can be successfully applied in the management of recurrent oroantral communications.

Keywords: Oroantral fistula, Buccal fat pad, Palatal island flap

1. Introduction

Oroantral fistula (OAF) is an epithelialized pathological communication between the oral cavity and the maxillary sinus that most commonly develops following extraction of maxillary posterior teeth, cyst or tumor surgery, trauma, or implant-related procedures (1,5). If left untreated, OAF may result in chronic maxillary sinusitis, passage of fluids between the oral cavity and the nasal cavity, speech disturbances, and a significant reduction in quality of life (1,5).

Several surgical techniques have been described for the management of OAF, including the buccal advancement flap, buccal fat pad (BFP) flap, and palatal rotational or island flap (1–3). The buccal fat pad flap is widely accepted because of its rich vascularity and high success rate; however, flap failure or incomplete closure may occur in large defects, compromised tissues, or previously operated sites, requiring alternative reconstructive procedures (2,3,6). This report presents the successful management of a persistent oroantral fistula that developed after failure of a buccal fat pad flap using a pedicled palatal island flap.

2. Case Report

A 78-year-old female patient was referred to our clinic because of an oroantral communication that developed following extraction of the maxillary right second molar (tooth #17). Initially, the defect had been treated using a buccal fat pad flap; however, clinical follow-up revealed incomplete closure of the defect, epithelialization of the communication, and subsequent formation of a persistent oroantral fistula.

The patient complained of fluid leakage from the oral cavity into the nasal cavity and discomfort in the affected region. Clinical and radiographic examinations confirmed the presence of a persistent oroantral fistula, and surgical closure was planned.

Before surgery, the design of the palatal island flap was outlined on the palate (Figure 1). During the

procedure, the epithelialized fistulous tract was completely excised, and all unhealthy soft tissues surrounding the defect were removed to obtain fresh wound margins (Figure 2). A pedicled palatal island flap based on the greater palatine artery was then carefully elevated and rotated to cover the defect (Figure 3). The flap was adapted without tension and secured with interrupted sutures. The donor site was covered with oxidized regenerated cellulose (Surgicel®) and allowed to heal by secondary intention (Figure 4).

Postoperatively, the patient received appropriate antibiotic therapy, analgesics, oral hygiene instructions, and dietary recommendations. Follow-up examinations demonstrated excellent flap viability without evidence of flap necrosis, wound dehiscence, or infection. Complete closure of the oroantral fistula was achieved, and all symptoms resolved successfully.

3. Discussion

Successful management of oroantral fistulas depends on several factors, including defect size, tissue quality, previous surgical procedures, and the presence of maxillary sinus infection (1,2,5). Although the buccal fat pad flap remains one of the most reliable techniques because of its excellent vascularity and ease of use, flap necrosis, wound dehiscence, or incomplete epithelialization may occasionally result in persistent fistulas requiring secondary reconstruction (2,3,6).

The palatal island flap offers several advantages in salvage procedures. Owing to its robust blood supply from the greater palatine artery, it provides excellent tissue viability, adequate thickness, and stable coverage of the defect while preserving the depth of the buccal vestibule (1,4,7). These characteristics make it particularly suitable for recurrent oroantral fistulas or cases in which primary closure has failed.

In the present case, complete closure of the fistula was achieved using a palatal island flap after unsuccessful treatment with a buccal fat pad flap. The absence of postoperative complications and maintenance of flap vitality support previous reports suggesting that the palatal island flap is a predictable and reliable salvage technique for persistent oroantral fistulas (1,4,7).

4. Conclusion

Various surgical techniques have been described for the management of oroantral fistulas; however, treatment selection should be individualized, particularly in patients with previous unsuccessful surgical attempts (1,2). In the present case, the palatal island flap provided predictable healing, excellent vascular support, and preservation of the buccal vestibular depth following failure of a buccal fat pad flap. These findings suggest that the pedicled palatal island flap represents a reliable and effective treatment option for recurrent or persistent oroantral fistulas (1,4,7).

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6. Figure Legends

Figure 1. Preoperative design of the palatal island flap.

Figure 2. Excision of the epithelialized fistulous tract.

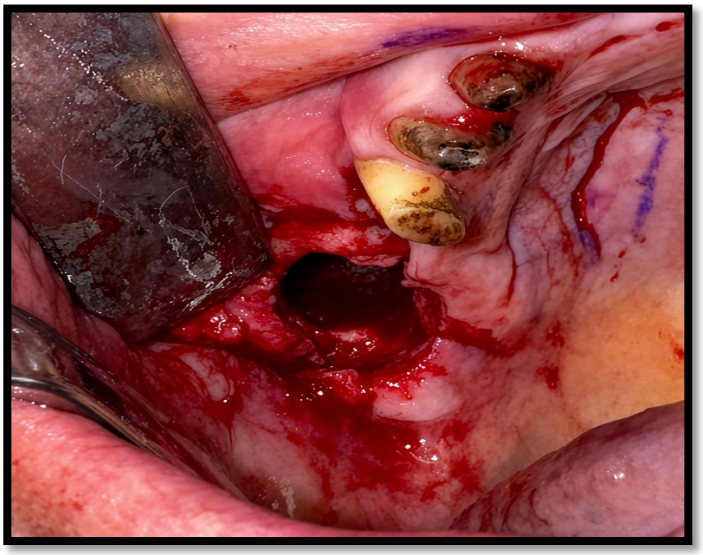


Figure 3. Rotation and adaptation of the palatal island flap.

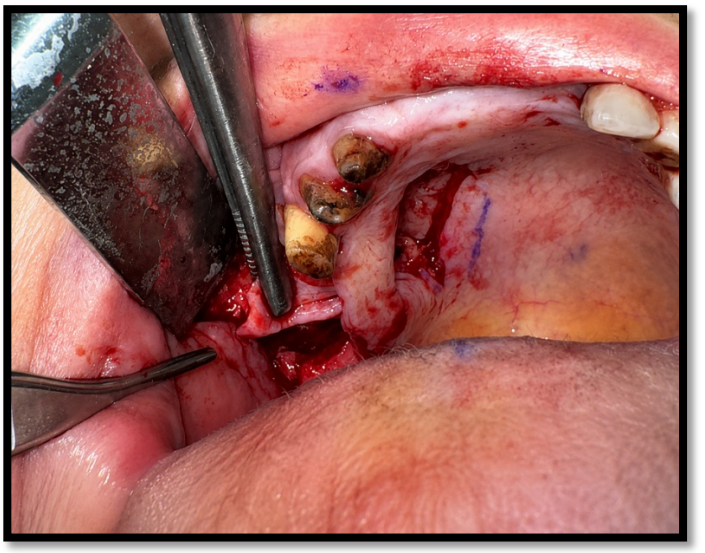
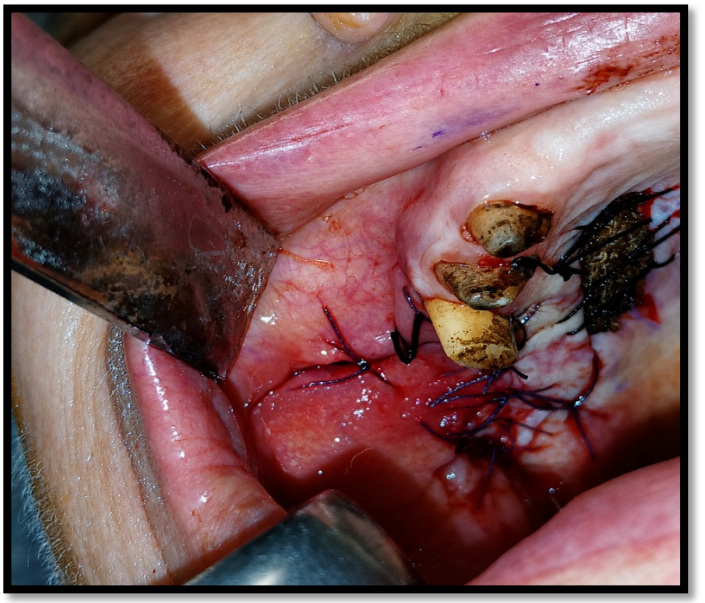


Figure 4. Immediate postoperative clinical appearance.



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EP-100

RECONSTRUCTION OF ANTERIOR MAXILLARY ALVEOLAR FRACTURE AND LARGE DEFECT WITH PLATE: A CASE REPORT

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Abstract

Objective: Alveolar fractures resulting from maxillofacial trauma can lead to significant problems in terms of aesthetics, function, and occlusion, particularly in the anterior region. In cases accompanied by extensive bone defects, the healing process may be adversely affected if proper stabilization is not achieved. Therefore, the primary goals of treatment are the stabilization of fracture segments and the preservation of the alveolar contour.

Case Report: A 37-year-old male patient presented with complaints of post-traumatic pain, mobility, and aesthetic impairment in the anterior maxillary region. Clinical and radiographic evaluation revealed an alveolar fracture accompanied by a large bone defect.During treatment planning, the prognosis of tooth number 11 was assessed as poor, and its extraction was decided. Under local anesthesia, the tooth was removed atraumatically, and the defect area was thoroughly evaluated. The mobile alveolar segments were reduced and brought into their anatomical position. To ensure stability within the extensive defect area and to preserve the alveolar contour, a reconstruction plate was placed in the region. Subsequently, the soft tissues were closed primarily.

Conclusion: In the treatment of alveolar fractures presenting with large defects in the anterior maxilla, the use of plates significantly contributes to preserving both functional integrity and aesthetic contour by ensuring the stabilization of fracture segments. The approach implemented in this case achieved stable healing during the postoperative period, demonstrating that plate application is a reliable and effective treatment method, particularly in complex cases involving extensive defects.

Keywords: alveolar fracture; maxillofacial trauma; plate fixation

1. Introduction

Alveolar fractures are among the most common injuries associated with maxillofacial trauma and may result in significant esthetic, functional, and occlusal complications, particularly when they involve the anterior region (1–3). Depending on the severity of the trauma, these injuries may be accompanied by comminuted alveolar fractures, segmental displacement, tooth loss, and extensive alveolar bone defects (1–3). Treatment planning becomes increasingly challenging, especially in cases involving disruption of the alveolar arch integrity and substantial bone loss. In such situations, anatomical reduction of the fractured segments alone is insufficient; achieving rigid stabilization and preserving the alveolar contour are essential for optimal bone healing and long-term functional rehabilitation (1,2).

2. Case Report

A 37-year-old male patient presented with pain in the anterior maxillary region, mobility of the anterior teeth, difficulty in mastication, and esthetic impairment following facial trauma. Clinical and radiographic examinations revealed an anterior maxillary alveolar fracture associated with an extensive alveolar bone defect and loss of supporting bone (Figure 1). Tooth #11 was extracted because of its hopeless prognosis, whereas tooth #21 exhibited Miller Class II mobility and was scheduled for follow-up. The displaced alveolar segments were anatomically reduced and rigidly fixed with a 2.0-mm titanium miniplate

(Figure 2). Primary wound closure was achieved (Figure 3). The postoperative course was uneventful, and clinical and radiographic follow-up confirmed stable fracture healing (Figure 4).

3. Discussion

The management of alveolar fractures depends on fracture location, displacement, bone loss, and associated dental injuries. Although dental splinting is generally sufficient for uncomplicated fractures, rigid fixation is indicated in cases involving extensive bone defects or when adequate stability cannot be achieved (1–3).

Titanium miniplate systems provide three-dimensional stabilization of fractured segments and preserve alveolar arch continuity, thereby facilitating future prosthetic or implant-supported rehabilitation (1,2,5).

In the present case, splinting alone was considered insufficient because of the extensive bone defect. Rigid fixation with a titanium miniplate resulted in stable healing without postoperative complications.

Previous studies have reported high success rates and improved functional outcomes with miniplate fixation in alveolar fractures associated with extensive bone loss (2,5). Careful plate positioning and appropriate screw selection are essential to avoid injury to adjacent tooth roots and optimize clinical outcomes (1–3).

4. Conclusion

Alveolar fractures associated with extensive bone defects represent complex injuries requiring meticulous treatment planning. In the present case, rigid fixation with a titanium miniplate resulted in favorable clinical and radiographic outcomes without postoperative complications. Titanium miniplate fixation appears to be a reliable and effective treatment option for anterior alveolar fractures associated with extensive bone loss (2,5).

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6. Figures

Figure 1. Preoperative panoramic radiograph.

Figure 2. Adaptation and rigid fixation of the titanium miniplate.

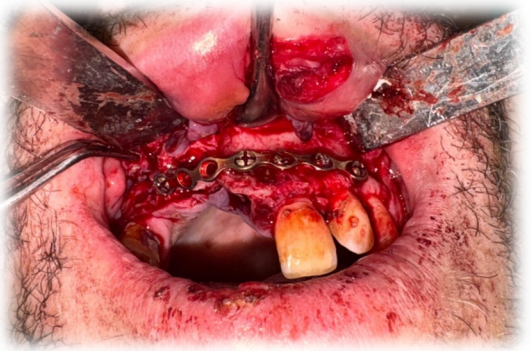

Figure 3. Clinical view following primary wound closure.

Figure 4. Postoperative panoramic radiograph.

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EP-101

MINIPLATE FIXATION COMBINED WITH INTERMAXILLARY FIXATION IN MANDIBULAR SYMPHYSIS AND CONDYLAR FRACTURES: A CASE REPORT

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Abstract

Objective

Mandibular fractures are among the most common maxillofacial injuries, with the symphysis and condylar regions being frequently affected (1,2,4). The primary goals of treatment are restoration of anatomical alignment, stable occlusion, and early functional recovery (2,3,4). This report presents the management of a patient with concomitant mandibular symphysis and condylar fractures treated with miniplate fixation combined with intermaxillary fixation (IMF).

Case

A 37-year-old male presented with pain in the mandibular region, malocclusion, and restricted mouth opening following facial trauma. Clinical examination demonstrated tenderness during mandibular movement, facial edema, and disturbed occlusion. Panoramic radiography and cone-beam computed tomography (CBCT) revealed a displaced mandibular symphysis fracture associated with a condylar fracture. Surgical treatment was planned. Intermaxillary fixation was first established to restore proper occlusion. Open reduction of the symphysis fracture was then performed, followed by rigid internal fixation using a titanium miniplate and screws. The condylar fracture was managed conservatively with intermaxillary fixation. Stable occlusion was confirmed intraoperatively. The patient received postoperative instructions regarding oral hygiene, nutrition, and mandibular exercises and was followed regularly during the healing period.

Conclusion

The combination of rigid internal fixation for mandibular symphysis fractures and intermaxillary fixation provides stable occlusion and satisfactory functional recovery in selected patients with concomitant condylar fractures (5-8). Accurate diagnosis, careful treatment planning, and appropriate fixation techniques are essential for successful management of mandibular fractures.

Keywords: Mandibular fracture, Symphysis fracture, Condylar fracture

1. Introduction

The mandible is one of the most frequently fractured bones of the facial skeleton because of its prominent position and mobility (1,2,4). Among mandibular fractures, the symphysis and condylar regions are commonly involved depending on the direction and magnitude of traumatic force (2,4). Symphysis fractures usually result from direct trauma, whereas condylar fractures often occur due to transmission of impact forces through the mandible (2,4).

Untreated mandibular fractures may lead to malocclusion, impaired mastication, speech difficulties, temporomandibular joint dysfunction, and facial deformity. The principal objectives of treatment include anatomical reduction of fracture segments, restoration of occlusion, stable fixation, and early return of mandibular function. Open reduction and internal fixation have become the preferred treatment modality for displaced mandibular fractures because they provide predictable functional and aesthetic outcomes (1,3,5,6).

2. Case Report

A 37-year-old male patient was referred to the Department of Oral and Maxillofacial Surgery after facial trauma. The patient complained of mandibular pain, malocclusion, and limited mouth opening.

Clinical examination revealed tenderness during mandibular movements, swelling in the lower facial region, and disturbed dental occlusion. Panoramic radiography and cone-beam computed tomography demonstrated a displaced fracture of the mandibular symphysis accompanied by a condylar fracture.

Based on the clinical and radiographic findings, surgical intervention was planned. Under local anesthesia, intermaxillary fixation was initially established to achieve correct occlusion. Open reduction of the symphysis fracture was subsequently performed, and anatomical reduction was achieved. The fracture was stabilized using a titanium miniplate and screws, providing rigid internal fixation.

The condylar fracture was treated conservatively and supported with intermaxillary fixation. At the completion of surgery, stable occlusion was verified clinically.

Postoperatively, the patient received detailed instructions regarding oral hygiene maintenance, dietary modifications, and mandibular physiotherapy. Regular follow-up examinations demonstrated satisfactory healing without postoperative complications.

3. Discussion

Combined mandibular symphysis and condylar fractures present unique challenges because treatment must restore both anatomical integrity and functional occlusion (2,4,7). The treatment strategy depends on fracture displacement, occlusal stability, and patient-related factors.

Rigid internal fixation with miniplates has become the standard treatment for displaced symphysis fractures due to its ability to provide stable fixation and facilitate early functional rehabilitation (1,5,6). In cases where

condylar fractures are minimally displaced and occlusion can be restored, conservative treatment combined with intermaxillary fixation remains an effective therapeutic option (7,8).

In the present case, stabilization of the symphysis fracture with miniplate fixation together with intermaxillary fixation resulted in stable occlusion and satisfactory functional recovery. Conservative management of the condylar fracture was successful without the need for additional surgical intervention.

These findings support previous reports indicating that appropriate case selection and individualized treatment planning contribute significantly to favorable clinical outcomes (5-8).

4. Conclusion

The successful management of combined mandibular symphysis and condylar fractures depends on accurate diagnosis, careful treatment planning, and appropriate fixation techniques. Rigid fixation of the symphysis combined with intermaxillary fixation can provide excellent occlusal stability and functional recovery in selected patients. Long-term clinical follow-up remains essential to monitor mandibular function and temporomandibular joint health.

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6. Figures

Figure 1. Preoperative panoramic radiograph demonstrating mandibular fractures.

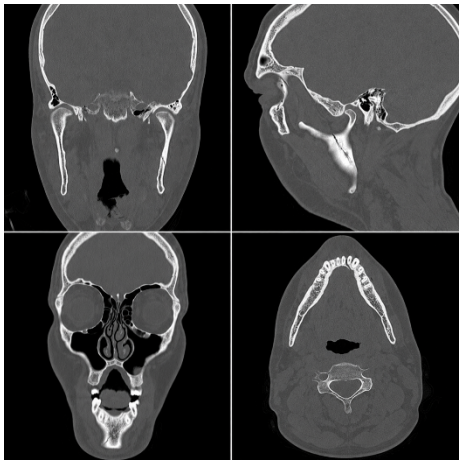

Figure 2. Cone-beam computed tomography images showing displaced symphysis fracture and condylar fracture.

Figure 3. Intraoperative view after open reduction and miniplate fixation of the symphysis fracture.

Figure 4. Intermaxillary fixation performed for occlusal stabilization.

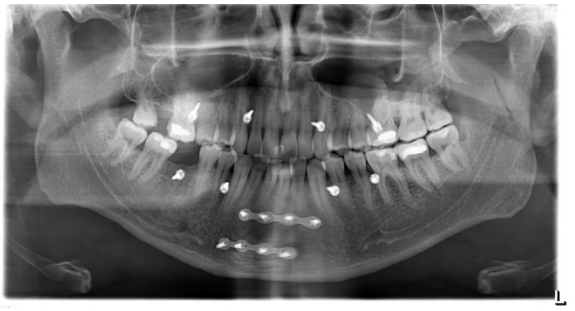

Figure 5. Postoperative panoramic radiograph demonstrating stable fixation and satisfactory reduction.

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EP-103

COMBİNED ZYGOMATİC AND CONVENTİONAL IMPLANT REHABİLİTATİON İN A SEVERELY ATROPHİC MAXİLLA: A CASE REPORT

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Abstract

Introduction: Severely atrophic maxilla presents significant clinical challenges in dental implant rehabilitation. Due to insufficient bone volume, placement of conventional implants without augmentation procedures is often not feasible. In such cases, zygomatic implants have emerged as an effective alternative approach by reducing the need for bone grafting and shortening the treatment period. This case report describes the combined application of zygomatic and conventional implants in a patient with a severely atrophic maxilla.

Case Report: A patient with a severely atrophic maxilla was referred to our clinic following clinical and radiological evaluation. As part of the treatment plan, placement of two bilateral zygomatic implants and three conventional implants in the anterior region was planned. The surgical procedure was performed under general anesthesia. For accurate positioning of the zygomatic implants, a window was created on the anterior wall of the sinus, and the implants were inserted into the zygomatic bone. Due to alveolar bone deficiency, the conventional implants were placed in a palatal position within the existing alveolar bone. The zygomatic implants were covered using the buccal fat pad. No postoperative complications were observed, and the healing period progressed uneventfully.

Conclusion: In patients with severely atrophic maxillae, zygomatic implants combined with conventional implant applications provide a reliable and effective treatment alternative by reducing the need for advanced augmentation procedures. With appropriate surgical planning and proper case selection, functional and prosthetic rehabilitation can be achieved in a relatively short period. In the present case, the combined treatment approach resulted in successful clinical outcomes with satisfactory healing and without postoperative complications.

Keywords: Zygomatic implant, Dental implant, Atrophic maxilla

1. Introduction

Severe maxillary atrophy represents one of the most challenging conditions in implant dentistry because the insufficient residual alveolar bone often prevents the placement of conventional dental implants. Traditionally, rehabilitation of these patients has relied on advanced bone augmentation procedures, including maxillary sinus floor elevation, onlay bone grafting, and autogenous bone grafts. Although these techniques have demonstrated predictable outcomes, they are associated with increased surgical morbidity, donor-site complications, prolonged treatment time, higher treatment costs, and the risk of graft resorption (1,4).

Since their introduction by Brånemark, zygomatic implants have become a reliable graftless alternative for the rehabilitation of severely atrophic maxillae. Several clinical studies and systematic reviews have reported survival rates exceeding 95%, demonstrating that zygomatic implants provide predictable long-term outcomes when appropriate surgical planning and patient selection are achieved (2,3). Furthermore, combining posterior zygomatic implants with anterior conventional implants has become a well-established treatment concept for full-arch rehabilitation, allowing stable prosthetic support while avoiding extensive bone grafting procedures (2,5).

The present report describes the surgical rehabilitation of a patient with a severely atrophic maxilla using bilateral zygomatic implants combined with three anterior conventional implants.

2. Case Report

A patient presenting with severe maxillary atrophy was referred to our clinic seeking implant-supported fixed prosthetic rehabilitation. Clinical examination and radiographic evaluation were performed using panoramic radiography (Figure 1) and cone-beam computed tomography (CBCT) (Figure 2). Radiographic findings revealed advanced posterior maxillary bone resorption with insufficient bone volume for conventional implant placement.

Following comprehensive treatment planning, rehabilitation with bilateral zygomatic implants in the posterior maxilla combined with three conventional implants in the anterior region was selected. This treatment approach was preferred to avoid extensive bone augmentation procedures and to provide adequate support for a full-arch fixed prosthesis.

The surgery was performed under general anesthesia. After elevation of a full-thickness mucoperiosteal flap, bilateral windows were prepared on the anterior wall of the maxillary sinus to facilitate the placement of the zygomatic implants (Figure 3). The sinus membrane was carefully elevated, and the implants were inserted into the zygomatic bone following the planned trajectory.

Because of severe anterior alveolar bone resorption, three conventional implants were placed in a palatal position to achieve sufficient primary stability (Figure 4). At the end of the procedure, the exposed cervical portions of the zygomatic implants were covered with pedicled buccal fat pad (Bichat's fat pad) to improve soft tissue coverage and wound healing (Figure 5). Primary closure was achieved using tension-free sutures.

The postoperative period was uneventful. No complications such as infection, sinusitis, wound dehiscence, or implant failure were observed during follow-up. Clinical examinations demonstrated satisfactory soft tissue healing and implant stability. Postoperative panoramic radiography confirmed correct implant positioning and adequate support for prosthetic rehabilitation (Figure 6).

3. Discussion

Rehabilitation of the severely atrophic maxilla remains one of the greatest challenges in implant dentistry because conventional implant placement is often impossible without advanced reconstructive procedures. Although sinus augmentation and autogenous bone grafting have been widely accepted as predictable treatment options, they require additional surgical interventions and are associated with increased morbidity, prolonged healing time, and possible graft-related complications (4).

Zygomatic implants were introduced to overcome these limitations by providing anchorage in the zygomatic bone, thereby eliminating or reducing the need for bone grafting (1). Long-term clinical studies have demonstrated excellent survival rates, while systematic reviews have reported cumulative survival rates above 95%, confirming the predictability of this treatment modality (2,3). In addition, combining zygomatic implants with conventional anterior implants has become a widely accepted approach for the rehabilitation of severely resorbed maxillae, offering favorable biomechanical support and high patient satisfaction (5,6).

In the present case, bilateral zygomatic implants were combined with three anterior conventional implants, allowing full-arch rehabilitation without additional bone augmentation procedures. Sufficient primary stability was achieved despite severe alveolar bone resorption. Furthermore, the use of the pedicled buccal fat pad provided adequate soft tissue coverage around the implant necks, contributing to uncomplicated wound healing. No postoperative complications, including sinusitis, implant failure, or soft tissue dehiscence, were observed during the follow-up period.

Despite the favorable clinical outcome, this report has inherent limitations. It describes the management of a single patient and lacks long-term prosthetic follow-up. Therefore, additional prospective clinical studies with larger patient populations and longer observation periods are required to further validate the long-term effectiveness of this treatment approach.

4. Conclusion

The combination of bilateral zygomatic implants and anterior conventional implants represents a predictable and effective treatment option for the rehabilitation of severely atrophic maxillae. This graftless approach reduces the need for extensive bone augmentation procedures while shortening treatment time and minimizing surgical morbidity. In the present case, successful implant placement, satisfactory soft tissue healing, and the absence of postoperative complications demonstrated the clinical feasibility of this treatment modality. Nevertheless, further long-term clinical studies are required to confirm the predictability of this approach.

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6. Figures

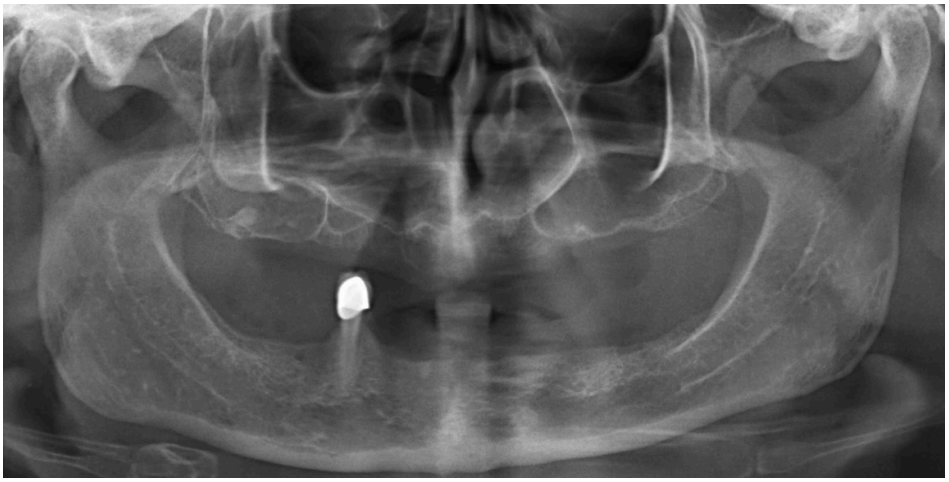

Figure 1. Preoperative panoramic radiograph.

Figure 2. Preoperative cone-beam computed tomography (CBCT).

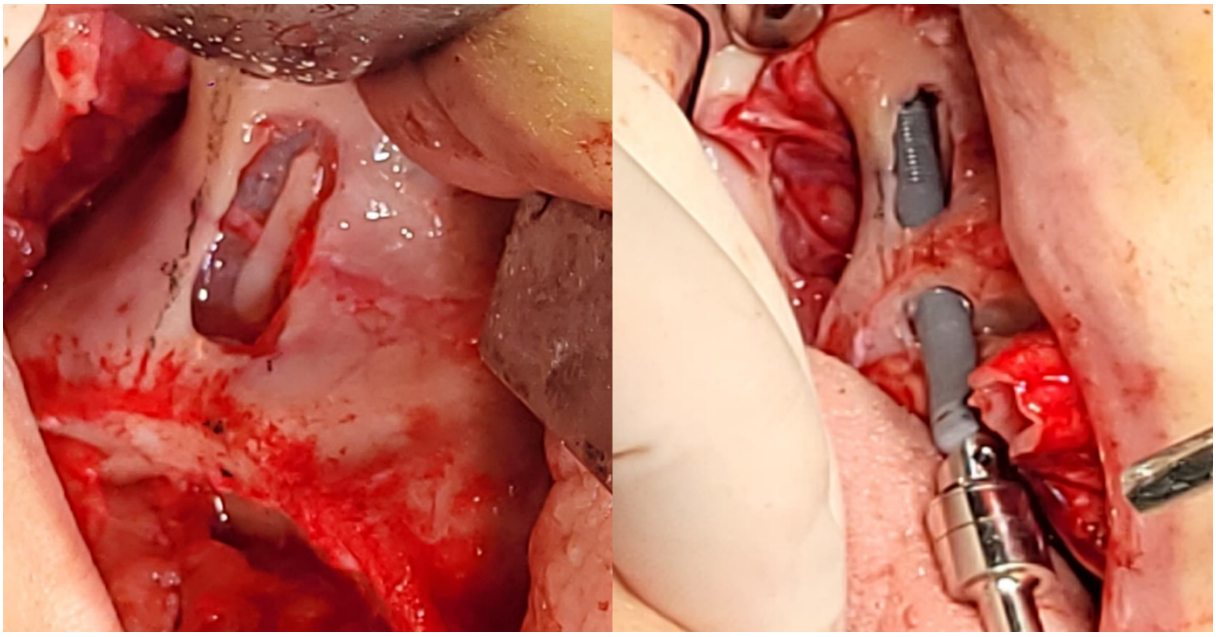

Figure 3. Bilateral anterior maxillary sinus window preparation.

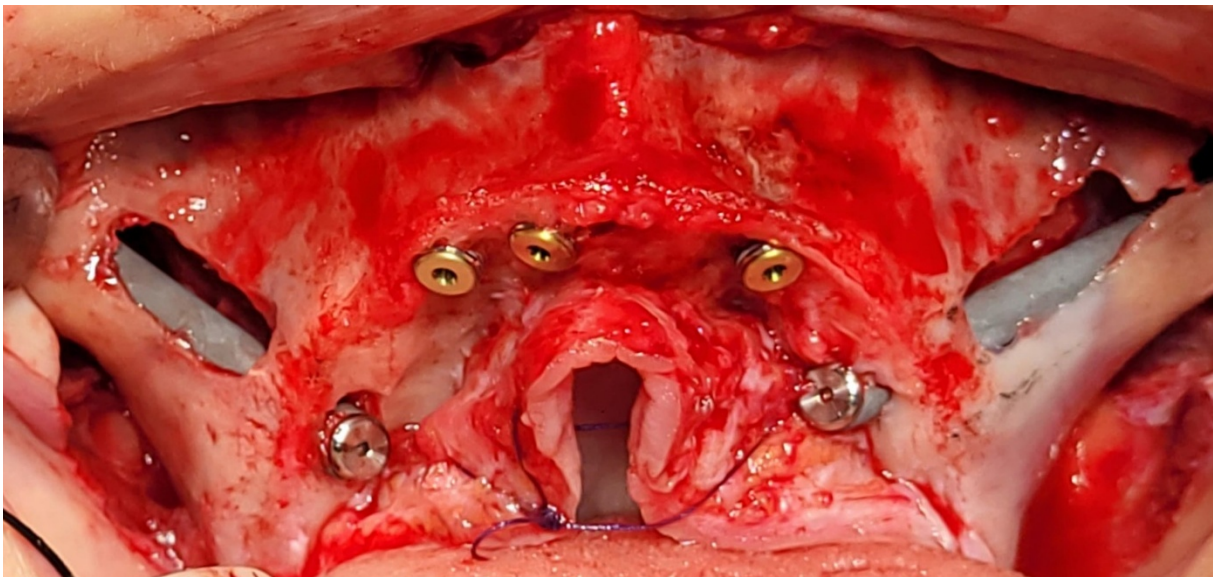

Figure 4. Placement of bilateral zygomatic implants and three anterior conventional implants.

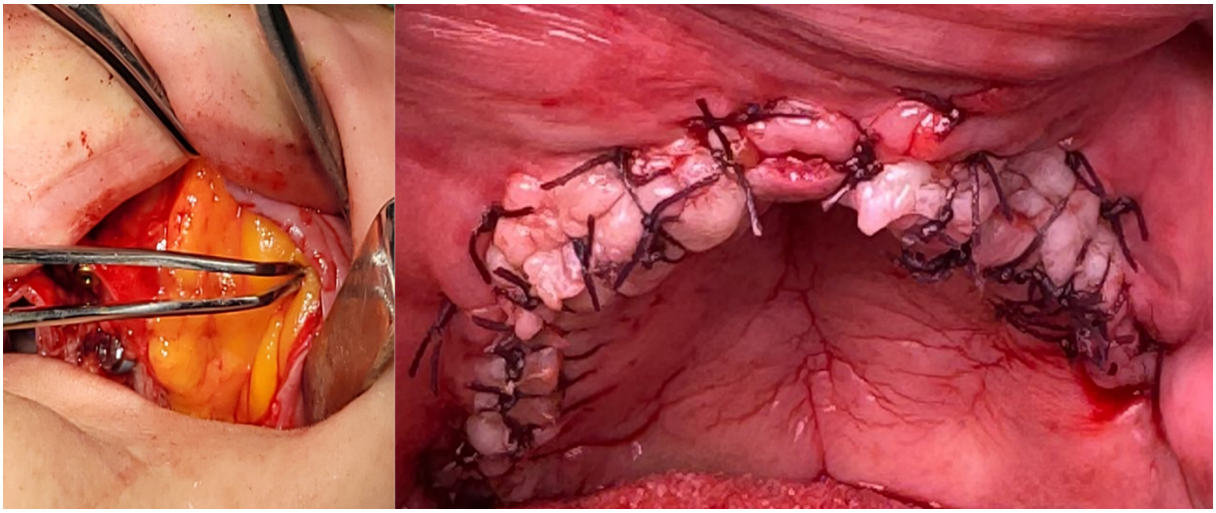

Figure 5. Soft tissue coverage using a pedicled buccal fat pad.

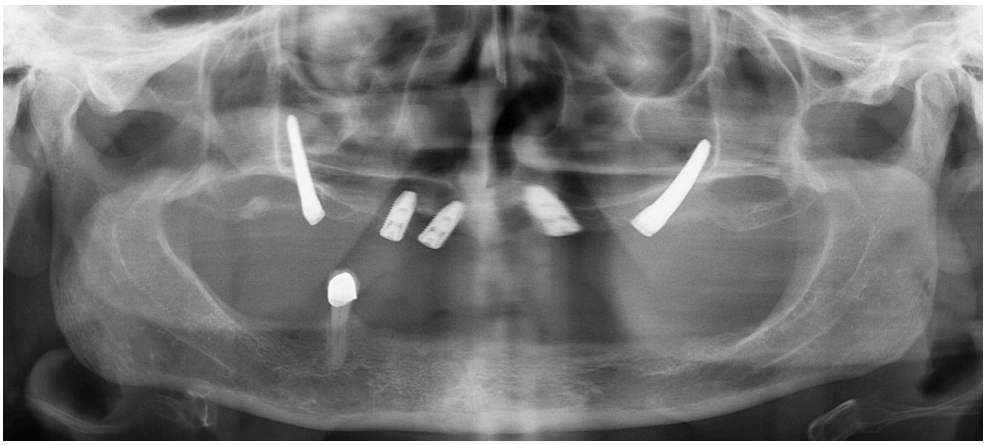

Figure 6. Immediate postoperative panoramic radiograph.

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RECONSTRUCTİON AND IMPLANT REHABİLİTATİON USİNG AN ANTERİOR ILİAC CREST GRAFT İN UNİLATERAL ALVEOLAR RİDGE DEFECTS: A CASE REPORT

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Abstract

Introduction: Alveolar defects associated with cleft lip and palate represent significant clinical conditions leading to both functional and aesthetic impairments. Autogenous bone grafts, particularly those harvested from the iliac crest, are widely accepted as the gold standard for the reconstruction of these defects. Achieving adequate bone volume is essential for subsequent implant-supported prosthetic rehabilitation. The aim of this study is to present the reconstruction of a unilateral alveolar cleft using an anterior iliac crest bone graft and the subsequent implant therapy.

Case Report:A 20-year-old patient with a unilateral alveolar cleft defect presented to our clinic. Following clinical and radiographic evaluation, reconstruction of the defect using an autogenous bone graft harvested from the anterior iliac crest was planned. The surgical procedure was performed under general anesthesia, and the graft was carefully adapted and stabilized in the defect area. No postoperative complications were observed, and satisfactory bone healing was achieved at the graft site. After completion of the healing period, a dental implant was placed in the reconstructed region, and successful osseointegration was obtained.

Conclusion: Reconstruction of alveolar cleft defects with anterior iliac crest bone grafts is a reliable and effective method that provides sufficient bone volume for implant placement. With appropriate surgical technique and timing, favorable functional and aesthetic outcomes can be achieved. This case supports the effectiveness of implant rehabilitation following iliac crest bone grafting in alveolar cleft patients.

Keywords: Alveolar cleft, Iliac crest bone graft , Dental implant

7. Introduction

Alveolar clefts associated with cleft lip and palate are congenital craniofacial deformities that compromise alveolar continuity, resulting in functional, esthetic, and psychosocial problems. Reconstruction of the alveolar cleft is essential to restore the continuity of the maxillary arch, support the nasal base, eliminate oronasal fistulas, and provide adequate bone volume for future implant-supported rehabilitation (1,2).

Autogenous bone grafting remains the gold standard for alveolar cleft reconstruction because of its osteogenic, osteoinductive, and osteoconductive properties. The anterior iliac crest is the most commonly preferred donor site due to its abundant corticocancellous bone and favorable clinical outcomes (3,4). This report presents the reconstruction of a unilateral alveolar cleft using an anterior iliac crest autogenous bone graft.

8. Case Report

A 20-year-old male patient presented with a missing tooth and insufficient bone volume in the anterior maxilla. Clinical and radiographic examinations revealed a unilateral alveolar cleft with significant alveolar bone deficiency (Figure 1). Considering the extent of the defect, reconstruction with an anterior iliac crest autogenous bone graft was planned.

The procedure was performed under general anesthesia. A full-thickness mucoperiosteal flap was elevated, and the recipient site was prepared by removing the fibrous tissue and reconstructing the nasal floor (Figure 2A). A corticocancellous bone graft was harvested from the anterior iliac crest and adapted to completely fill the alveolar defect (Figure 2B–C). Primary tension-free closure was achieved after graft placement (Figure 2D).

Postoperative healing was uneventful, with no evidence of infection, graft exposure, or wound dehiscence. Follow-up radiographic examinations demonstrated satisfactory graft incorporation and adequate bone regeneration . Based on the clinical and radiographic findings, sufficient bone volume was achieved for implant-supported rehabilitation, and a dental implant was subsequently placed. Prosthetic rehabilitation is planned following successful osseointegration.

9. Discussion

Secondary alveolar bone grafting with autogenous bone remains the reference standard for the reconstruction of alveolar clefts because of its predictable biological behavior and high clinical success

(1,3). The anterior iliac crest provides sufficient corticocancellous bone for large defects while maintaining acceptable donor-site morbidity (4). Recent systematic reviews continue to support iliac crest bone grafting as the most predictable treatment for achieving adequate bone regeneration before implant rehabilitation, despite ongoing research into alternative regenerative approaches (5,6).

In the present case, successful graft integration and satisfactory bone regeneration were achieved without postoperative complications. The regenerated bone provided sufficient volume for subsequent implant placement, demonstrating the effectiveness of anterior iliac crest bone grafting in the management of unilateral alveolar clefts. Nevertheless, long-term implant and prosthetic outcomes should be evaluated in future follow-up.

10. Conclusion

Anterior iliac crest autogenous bone grafting is a reliable and predictable treatment option for the reconstruction of unilateral alveolar clefts. The technique provides sufficient bone volume for implant-supported rehabilitation while restoring alveolar continuity with favorable clinical outcomes. The present case demonstrated successful bone regeneration without postoperative complications, supporting the continued role of iliac crest grafting as the gold standard for alveolar cleft reconstruction.

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6. Figures

Figure 1. Preoperative clinical and radiographic evaluation of the unilateral alveolar cleft.

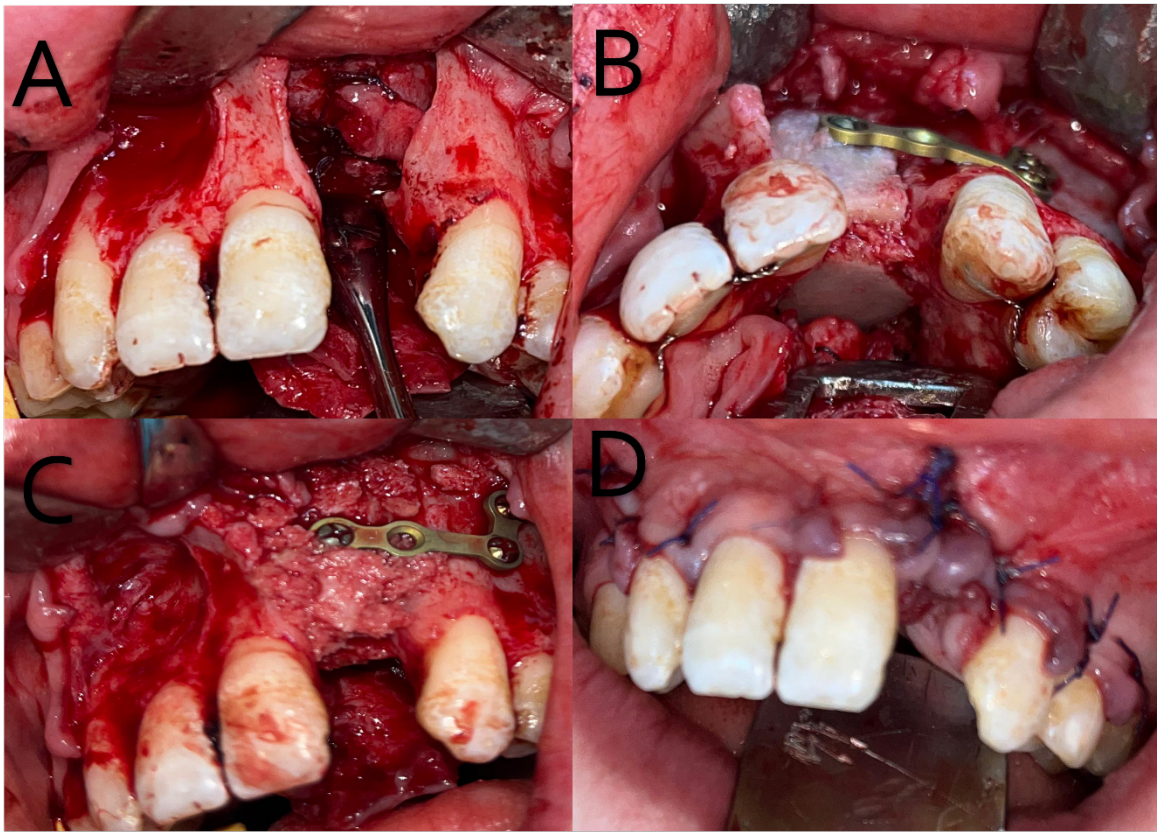

Figure 2A. Recipient site preparation and nasal floor reconstruction.

Figure 2B. Harvesting of the corticocancellous bone graft from the anterior iliac crest.

Figure 2C. Adaptation and placement of the autogenous bone graft into the alveolar cleft.

Figure 2D. Primary closure of the recipient site.

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EP-106

LOW-GRADE MUCOEPIDERMOID CARCINOMA IN THE PALATAL REGION: A Case Report

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Abstract

Introduction: Minor salivary gland tumors are uncommon lesions of the oral cavity and are most frequently located in the palatal region. Because of their slow growth and asymptomatic presentation, they may mimic benign lesions. Histopathological examination remains the gold standard for diagnosis.

Case Report: A healthy 16-year-old male presented with a painless palatal swelling. Pleomorphic adenoma was considered initially and the patient was followed clinically. The lesion enlarged during two months of follow-up and was totally excised. Histopathological examination revealed low-grade mucoepidermoid carcinoma. Healing was uneventful. The patient was referred to the Department of Otorhinolaryngology, where no additional pathology was detected, and he remains under regular follow-up.

Conclusion: Persistent palatal swellings should always be evaluated carefully and histopathological examination is essential for definitive diagnosis.

Keywords: Mucoepidermoid carcinoma, Palatal lesion, Minor salivary gland tumor, Pleomorphic adenoma

1. Introduction

Minor salivary gland tumors are relatively uncommon neoplasms and most frequently occur in the palate(1-2). Low-grade mucoepidermoid carcinoma often presents as a painless, slow-growing swelling and may mimic benign lesions such as pleomorphic adenoma(2-3). Therefore, histopathological examination is mandatory for definitive diagnosis. This report presents the clinical course and management of a young patient with low-grade mucoepidermoid carcinoma of the palate.

2. Case Report

A 16-year-old male patient presented with swelling in the left posterior palate. Clinical examination revealed a localized swelling with erythematous mucosa. Panoramic radiography showed no remarkable osseous pathology. Because of the benign appearance, the patient was followed clinically. At one month, erythema resolved but swelling persisted. At two months, enlargement of the lesion was observed and complete surgical excision was performed. Histopathological examination established the diagnosis of low-grade mucoepidermoid carcinoma. One week postoperatively, healing was satisfactory. The patient was referred to ENT; no further pathology was identified and regular follow-up continues.

3. Discussion

Low-grade mucoepidermoid carcinoma may easily be mistaken for benign palatal lesions because of its indolent clinical behavior(2-3). Persistent lesions that fail to regress during follow-up should be surgically evaluated(3-5). Complete excision provides favorable outcomes and histopathological examination remains indispensable.(4-5)

4. Conclusion

Low-grade mucoepidermoid carcinoma should be included in the differential diagnosis of persistent palatal swellings. Early diagnosis, surgical excision, and histopathological evaluation are essential.

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6. Figures

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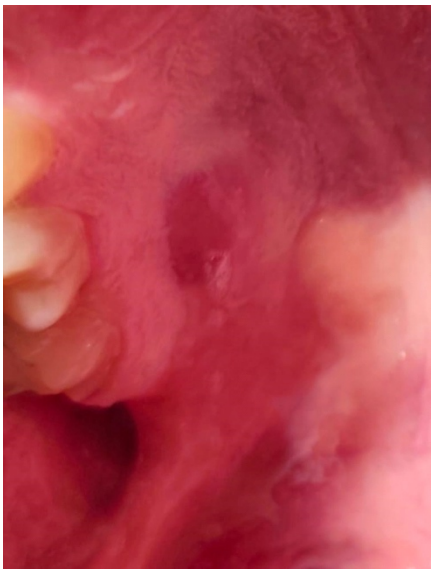
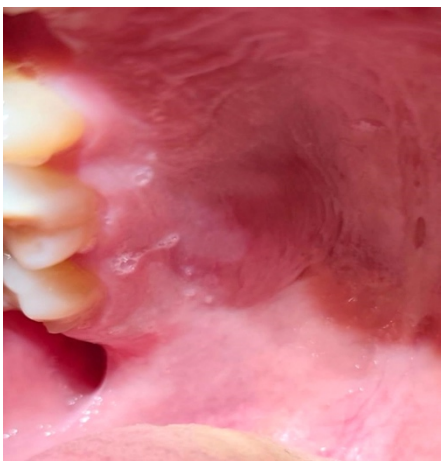
2. 

3. 

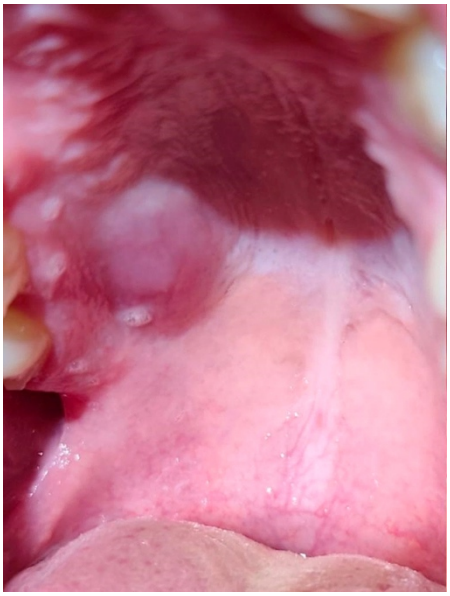
4. 

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Figure 1. Initial panoramic radiograph.

Figure 2. Initial clinical appearance.

Figure 3. One-month follow-up.

Figure 4. Two-month follow-up.

Figure 5. One-week postoperative appearance.

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Multidisciplinary Management of a Displaced Maxillary Alveolar Fracture in the Mixed Dentition Period: A 9-Month Follow-Up

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Abstract

Objective: Traumatic injuries to the maxillary anterior teeth are common in children and may result in dental and alveolar bone fractures. In the mixed dentition period, alveolar fractures involving permanent tooth germs require careful multidisciplinary management because of ongoing growth and occlusal changes. This case report presents the treatment and 9-month follow-up of a displaced maxillary alveolar fracture involving permanent canine germs after a traffic accident.

Case Report: An eleven-year-old male patient was admitted to our clinic with a maxillary alveolar fracture caused by a traffic accident. Clinical examination revealed inferior and palatal displacement of the maxillary alveolar segment, occlusal disturbance, and a negative overjet appearance. In addition, extensive soft tissue loss in the buccal gingiva and exposed alveolar bone were observed. Radiographic examination demonstrated bilateral fracture lines involving the permanent canine germs. Under general anesthesia, the displaced alveolar segment was reduced to its anatomical position and stabilized using a fiber splint. Due to the exposed bone and soft tissue defect, regular wound care was performed postoperatively. Endodontic treatment was initiated in the second postoperative month in the pediatric dentistry clinic because of trauma-related pulpal involvement. The fiber splints were removed in the third month. During the 9-month follow-up period, occlusion remained stable, hard and soft tissue healing was successfully completed, the impacted canines continued their development, and satisfactory esthetic and functional outcomes were achieved.

Conclusion: Maxillary alveolar fractures involving permanent tooth germs require long-term multidisciplinary follow-up to preserve growth, occlusion, and tooth development.

Early surgical reduction, splint stabilization, wound care, and pediatric/endodontic management contributed to successful outcomes in this case.

Keywords: Dentition, Mixed; Maxillofacial injuries, Tooth injuries

1. Introduction

Dentoalveolar injuries constitute a significant portion of maxillofacial trauma in children and are of particular concern because they occur during active craniofacial growth and dental development. Alveolar fractures involve displacement of an alveolar bone segment containing one or more teeth and may affect periodontal tissues, dental pulp, and developing permanent tooth germs. In pediatric patients, prompt diagnosis and appropriate management are essential, as these injuries may lead to long-term complications involving tooth eruption, occlusal development, and dentofacial growth (1,2). Management of alveolar fractures during the mixed dentition period differs from that in adults because developing permanent teeth and erupting dentition must be preserved while restoring anatomical alignment. Delayed or inadequate treatment may result in pulpal and periodontal complications, eruption disturbances, and occlusal abnormalities (3). Current evidence emphasizes early reduction and splint stabilization as key factors for successful healing. However, reports describing long-term outcomes of alveolar fractures involving developing permanent tooth germs remain limited (2,4).

2. Case Report

A systemically healthy 10-year-old boy presented to our clinic two days after sustaining maxillofacial trauma in a traffic accident. Extraoral examination revealed facial swelling and multiple lacerations. Intraoral examination demonstrated inferior and palatal displacement of the maxillary anterior alveolar segment, negative overjet, segmental mobility, extensive gingival tissue loss, and exposed alveolar bone.

Although the involved teeth exhibited no significant mobility, the alveolar segment moved as a single block. Panoramic radiography revealed a displaced bilateral alveolar fracture extending through the region of the developing permanent canine germs.

Because of the patient's agitated condition, cone-beam computed tomography could not be obtained. Based on the clinical and radiographic findings, emergency surgical treatment under general anesthesia was planned. After irrigation with sterile saline and removal of blood clots, the displaced alveolar segment was repositioned anatomically.

Proper occlusion was confirmed clinically, and a fiber splint extending from teeth #14 to #24 was applied to stabilize the segment. Due to extensive traumatic gingival tissue loss, primary closure was not possible and healing by secondary intention was allowed. Postoperatively, systemic antibiotics were prescribed, and the patient was recalled every two days for wound care and dressing changes. At the 10-day follow-up, complete epithelialization had not yet occurred; however, full soft tissue coverage was observed. The splint was maintained for eight weeks and subsequently removed without evidence of mobility or occlusal instability. At the eighth-week follow-up, pulpal necrosis was diagnosed in teeth #11, #12, #21, and #22. Single-visit root canal treatment was therefore performed by the Department of Pediatric Dentistry. At the 24-and 36-week follow-up examinations, the alveolar segment remained stable, satisfactory bone healing was evident, and functional occlusion was maintained.
Favorable esthetic and functional outcomes were achieved. Radiographic evaluation demonstrated continued development of both permanent canine germs with preservation of their physiological eruption pathway and no evidence of eruption disturbances. Clinical and radiographic follow-up is ongoing.

3. Discussion

Although alveolar fractures are relatively uncommon among pediatric dentoalveolar injuries, they are clinically important because of their potential impact on developing permanent teeth and supporting structures. During the mixed dentition period, treatment objectives include not only stabilization of the fractured segment but also preservation of normal dental development. Previous studies have reported pulpal, periodontal, and developmental complications associated with alveolar fractures, emphasizing the importance of long-term follow-up (3). In the present case, treatment planning was complicated by the involvement of bilateral developing permanent canine germs and extensive soft tissue loss. Permanent canines are particularly vulnerable because of their prolonged developmental period and complex eruption pathway.
Earlier studies have suggested that trauma involving developing tooth germs may lead to eruption disturbances, positional changes, or developmental defects. However, no such complications were observed during follow-up in the present case, indicating successful preservation of normal development and eruption (5).

Early anatomical reduction and adequate stabilization are widely accepted as fundamental principles in the management of alveolar fractures. Systematic reviews have shown that prompt repositioning facilitates periodontal healing, restores functional occlusion, and reduces the likelihood of long-term complications (2). In the present case, surgical reduction performed two days after injury corrected the negative overjet and re-established a stable occlusal relationship. Furthermore, the absence of segmental mobility following eight weeks of splinting confirmed successful stabilization and healing. Pulpal complications are among the most frequently reported sequelae of alveolar fractures. Displacement of the alveolar segment may compromise the vascular supply of affected teeth and increase the risk of pulpal necrosis (6). Consistent with previous reports, pulpal necrosis developed in four maxillary incisors and was successfully managed with endodontic treatment. This finding highlights the need for careful monitoring of traumatized teeth even when fracture healing appears satisfactory.

Another noteworthy aspect of this case was the favorable outcome despite extensive soft tissue loss and exposed alveolar bone at presentation. Previous studies have emphasized that treatment success in pediatric dentoalveolar trauma should be assessed not only by fracture healing but also by preservation of developing dentition and maintenance of function (7,8).

In the present case, stable occlusion, satisfactory bone healing, and continued canine development were observed throughout follow-up. These findings support the importance of a multidisciplinary approach involving surgical management, pediatric dental care, endodontic treatment, and long-term radiographic monitoring. Such collaboration enables early detection and management of complications while promoting optimal functional and developmental outcomes.

4. Conclusion

These findings suggest that early anatomical reduction, appropriate splint stabilization, and long-term multidisciplinary follow-up are critical for achieving favorable clinical outcomes in the management of displaced alveolar fractures involving developing permanent tooth germs during the mixed dentition period.

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6. Figures

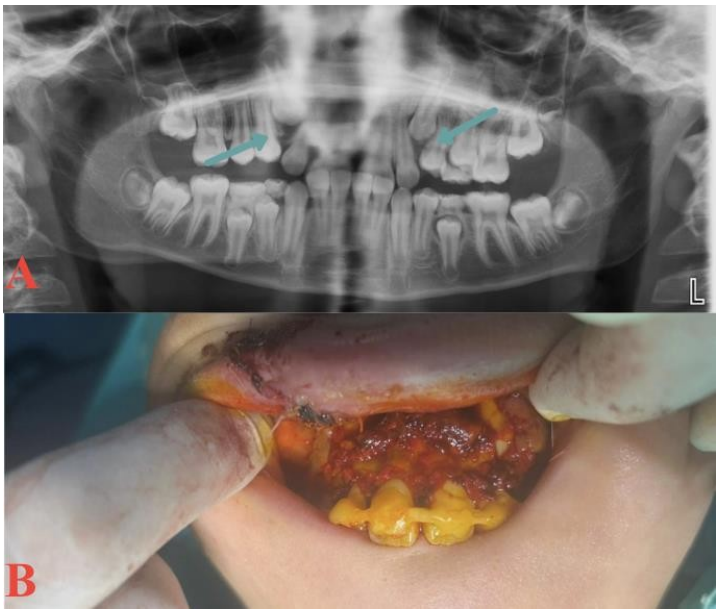

Figure 1. (A) Initial panoramic radiograph (OPG). Blue arrows indicate the fractured alveolar segment. (B) Clinical view after reduction and splinting, demonstrating the extensive laceration area and exposed maxillary bone.

Figure 2. (A) Intraoral photograph obtained on postoperative day 10. (B) Three-month follow-up intraoral photograph. (C) Six-month follow-up intraoral photograph. (D) Nine-month follow-up intraoral photograph demonstrating increased clinical crown exposure of tooth #23 and progression of the eruptive process of tooth #13, indicating continued physiologic eruption.

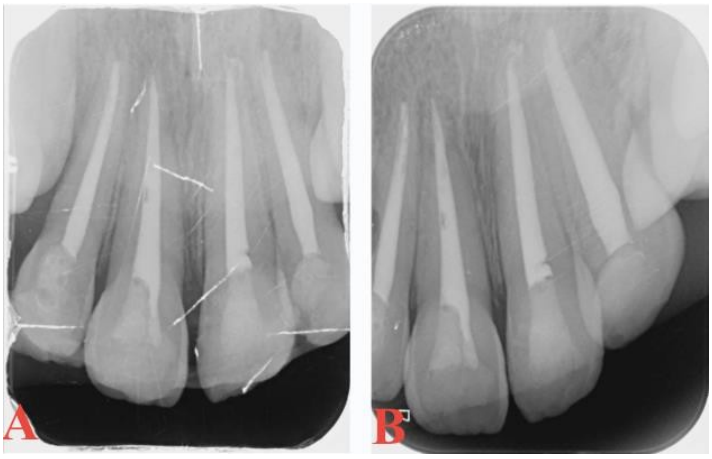

Figure 3. (A) Periapical radiograph obtained immediately after endodontic treatment. (B) Periapical radiograph at the 9-month follow-up.

Figure 4. Nine-month follow-up panoramic radiograph (OPG) demonstrating successful healing and consolidation of the fractured alveolar segments, along with continued eruption and normal developmental progression of the permanent canine tooth buds.

TÜRK ORAL VE MAKSİLLOFASİYAL CERRAHİ DERNEĞİ
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EP-114

TREATMENT OF MULTIPLE ODONTOGENIC KERATOCYSTS IN A PATIENT WITH GORLIN-GOLTZ SYNDROME: A CASE REPORT

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Abstract

Objective: Gorlin-Goltz Syndrome (Nevoid Basal Cell Carcinoma Syndrome, NBCCS) is an autosomal dominant disorder characterized by multiple odontogenic keratocysts (OKCs), basal cell carcinomas, and skeletal anomalies. Odontogenic keratocyst is an odontogenic lesion with aggressive behavior and a high recurrence potential, frequently presenting as multiple lesions at an early age in patients with Gorlin-Goltz syndrome. This case report presents the surgical enucleation of an odontogenic keratocyst associated with Gorlin-Goltz syndrome.

Case: Clinical and radiographic evaluation of a young male patient admitted to our clinic revealed a radiolucent lesion in the anterior maxillary region. The patient's medical history was significant for Gorlin-Goltz syndrome and multiple cystic lesions. Cone-beam computed tomography (CBCT) examination demonstrated a well-defined cystic lesion with cortical expansion in the relevant region. The lesion was completely removed under local anesthesia using the enucleation technique. During surgery, excision was carefully performed while preserving the relationship between the lesion and surrounding tissues. The excised specimen was submitted for histopathological examination, which confirmed the diagnosis of odontogenic keratocyst. The postoperative course was uneventful, and the patient was placed under regular follow-up.

Conclusion: Early diagnosis and appropriate surgical treatment are of great importance in odontogenic keratocysts associated with Gorlin-Goltz syndrome. Although enucleation is an effective treatment method when carefully performed, long-term follow-up is necessary because of the high risk of recurrence. This case highlights the importance of a multidisciplinary approach in the management of odontogenic keratocysts in syndromic patients.

Keywords: Gorlin-Goltz syndrome, odontogenic keratocyst, enucleation

1. Introduction

Gorlin-Goltz syndrome, also known as Nevoid Basal Cell Carcinoma Syndrome (NBCCS), is a rare autosomal dominant genetic disorder primarily associated with pathogenic variants of the PTCH1 gene and characterized by multiple basal cell carcinomas, odontogenic keratocysts (OKCs), ectopic calcifications, and various skeletal abnormalities (1–3). Odontogenic keratocysts are among the most common oral and maxillofacial manifestations of the syndrome and frequently develop during the first and second decades of life as multiple lesions (2,3). Owing to their thin epithelial lining, locally aggressive behavior, and high recurrence potential, these lesions are of considerable clinical importance (4–6). Early diagnosis and appropriate treatment are essential to minimize functional and esthetic morbidity (1,4). This case report presents the surgical management of an odontogenic keratocyst located in the anterior maxilla of a patient with Gorlin-Goltz syndrome.

2. Case Report

A 17-year-old male patient presented to our clinic after an asymptomatic radiolucent lesion was detected in the anterior maxilla during routine clinical and radiographic examination. The patient's

medical history revealed a diagnosis of Gorlin-Goltz syndrome and previous treatment for multiple odontogenic keratocysts involving different regions of the jaws.

Clinical examination revealed no pain, swelling, or signs of infection. Cone-beam computed tomography (CBCT) and panoramic radiography demonstrated a well-defined unilocular radiolucent lesion causing cortical expansion (Figures 1 and 2). Following evaluation of the lesion and its relationship with adjacent anatomical structures, surgical enucleation was planned.

The procedure was performed under local anesthesia. After elevation of a mucoperiosteal flap, the cystic lesion was carefully separated from the surrounding bone and completely removed by enucleation (Figure 3). Particular attention was paid to preserving the integrity of the cystic lining and avoiding damage to adjacent anatomical structures. The surgical site was irrigated thoroughly and closed primarily. Histopathological examination confirmed a parakeratinized odontogenic keratocyst.

The postoperative course was uneventful. Clinical and radiographic follow-up demonstrated satisfactory healing (Figure 4). Considering the high recurrence potential associated with Gorlin-Goltz syndrome, the patient was enrolled in a long-term clinical and radiographic follow-up program.

3. Discussion

Odontogenic keratocysts are among the hallmark manifestations of Gorlin-Goltz syndrome and typically occur at a younger age than sporadic lesions. Patients with NBCCS frequently present with multiple cysts and have a substantially increased risk of recurrence because of the underlying PTCH1 mutation and the intrinsic biological behavior of these lesions (1–3).

The optimal management of odontogenic keratocysts remains controversial. Conservative approaches, including enucleation and marsupialization, preserve adjacent anatomical structures and reduce surgical morbidity, whereas more aggressive procedures, such as peripheral ostectomy or resection, may reduce recurrence but are associated with greater functional and esthetic morbidity (4,7). In the present case, complete enucleation was selected because the lesion was well-defined and could be removed without compromising adjacent anatomical structures.

Histopathological examination confirmed the diagnosis of a parakeratinized odontogenic keratocyst, which is the subtype most frequently associated with Gorlin-Goltz syndrome (1,6). Although postoperative healing was uneventful, patients with NBCCS remain at lifelong risk of developing new odontogenic keratocysts or experiencing recurrence (2,4,5). Therefore, long-term clinical and radiographic follow-up is essential for the early detection and management of recurrent or newly developed lesions.

4. Conclusion

Patients with Gorlin-Goltz syndrome frequently develop multiple odontogenic keratocysts at an early age and require lifelong clinical and radiographic surveillance (2,5,6). Although enucleation represents an effective and conservative treatment modality in appropriately selected cases, recurrence remains a major concern, particularly in syndromic patients (4–6). The present case highlights the importance

of a multidisciplinary approach in the diagnosis and management of Gorlin-Goltz syndrome and emphasizes the value of regular long-term follow-up for the early detection of recurrent lesions.

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6. Figures

Figure 1. Preoperative CBCT image.

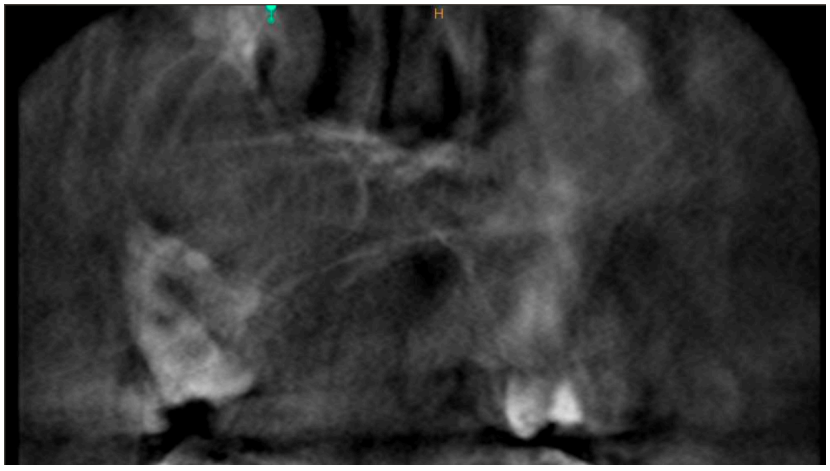

Figure 2. Preoperative panoramic radiograph.

Figure 3. Intraoperative view after complete enucleation.

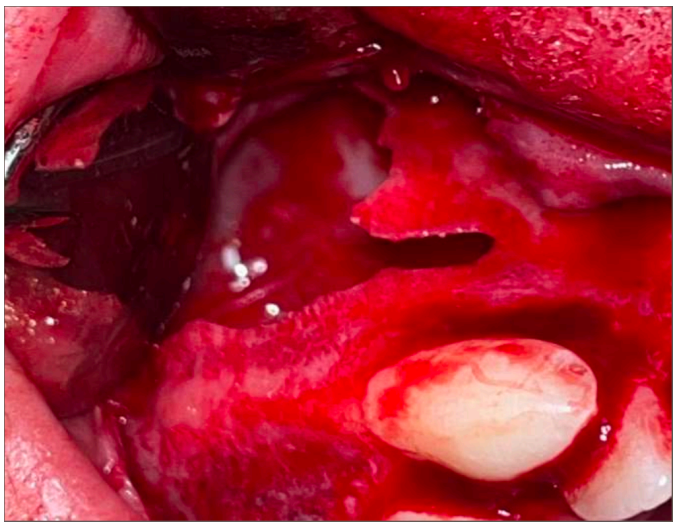

Figure 4. Postoperative panoramic radiograph showing satisfactory healing.

EP-115

COMPARATIVE ANALYSIS OF TWO DIFFERENT OROANTRAL FISTULA CLOSURE TECHNIQUES: A CLINICAL STUDY

ABSTRACT

Objective: Oro-antral communication (OAC) is an uncommon but important complication in dentoalveolar and maxillofacial surgery. Various closure techniques exist, depending on the size and location of the defect. This retrospective study evaluates the effectiveness of the palatal submucosal connective tissue flap (PSCTF) compared to the buccal fat pad flap (BFPF) in the closure of oro-antral fistulas (OAFs).
Materials and Methods: Twenty patients were randomly divided into two groups. Group I underwent OAF closure using the BFPF, and Group II received closure with the PSCTF. Postoperative parameters such as pain, mouth opening, swelling, infection, and wound healing were assessed on the 7th and 28th postoperative days to determine clinical outcomes.
Results: Statistical analysis showed no significant difference in pain levels between the two groups on both the 7th and 28th days. Similarly, swelling scores did not significantly differ preoperatively or on the 1st postoperative day ($p = 0.821$).
Conclusion: Both PSCTF and BFPF are reliable techniques for closing large OACs. While neither method demonstrated long-term superiority, BFPF was associated with more short-term edema, and PSCTF with slightly increased pain, indicating both approaches are clinically effective with minor differences in early healing responses.

Keywords: Oro-antral fistula, submucosal connective tissue, buccal fat pad, maxillofacial surgery

INTRODUCTION

Oro-antral communication (OAC) is a relatively rare complication of dentoalveolar and maxillofacial surgery [1]. OAC arises after the extraction of maxillary posterior teeth whose root tips are anatomically close to the maxillary antrum, along with the thin bone in this region [2]. OAC creates a pathological pathway for bacterial infiltration, potentially leading to antrum infection and impaired healing due to abnormal communication between the oral cavity and maxillary sinus. Untreated OACs may cause maxillary sinusitis in 50% of patients within 48 hours and in 90% within 2 weeks, emphasizing the urgent need for early diagnosis and prompt intervention. If left untreated, OACs can progress to chronic sinusitis and severe complications, particularly when communication persists and epithelializes, resulting in an oro-antral fistula (OAF) [3].
Various techniques have been described for closing OACs, depending on the size of the opening. Smaller openings may heal spontaneously or be treated with simple surgical methods, while larger openings (>6 mm) often require surgical interventions such as local flaps, buccal fat pads, or grafts. Buccal flaps and buccal fat pads are commonly preferred [4]. However, disadvantages of using mucoperiosteal flaps from the buccal region include postoperative pain, swelling, and long-term complications related to buccal sulcus depth and poor denture fit. Numerous prospective and retrospective clinical studies have examined the success of different methods used in OAC treatment [5]. The main flaps for the closure of OAF are buccal flaps, palatal flaps, and their modifications [6]. Buccal flaps have been successful in effectively closing OAFs; however, care must be taken during the procedure to avoid injury to the parotid papilla and/or the duct. Despite their technical simplicity, buccal flaps have several disadvantages, including their thin nature, tendency to obliterate the mucobuccal

fold, and instability due to cheek movements [7].
An alternative but less commonly used technique for OAF closure is the buccal fat pad flap (BFPF) technique, first described by Egyedi [8]. The BFPF technique involves the use of a pedicled buccal flap. The size of the BFPF remains consistent regardless of an individual's body weight and fat distribution due to its proximity, which reduces surgical time and facilitates easy harvest and mobilization. Additionally, BFPF provides an excellent blood supply, causing minimal donor-site morbidity. Complete epithelialization typically occurs within 2–3 weeks. This technique also significantly minimizes the risk of reduced vestibular depth, which may occur with buccal advancement flaps [8,9]. The palatal flap and its modifications have proven effective in successfully closing OAFs. The palatal mucosa is thicker and firmer than the buccal mucosa, allowing for the design and advancement of a well-nourished flap supplied by blood vessels from the anterior palatine foramen, particularly the palatine artery [10, 11].

The advantage of utilizing a pedicled palatal flap for OAF closure is the preservation of buccal vestibule depth. However, rotation of the palatal mucoperiosteum flap may result in an exposed palatal area until secondary epithelialization occurs, creating a bulge of soft tissue at the axis of rotation. The submucosal connective tissue palatal flap technique (PSCTF) successfully addresses these challenges. This modification effectively provides mucosal coverage for the raw area, enhancing the outcome of the closure procedure [11,12,13].

This prospective study aims to assess the efficiency of the PSCTF compared with the BFPF technique for the closure of OAFs. Through a retrospective analysis, this study aims to provide valuable insights into the success rates and outcomes of these two closure techniques, offering a comprehensive understanding of their advantages and potential limitations

MATERIALS AND METHODS

The study was designed as a retrospective cohort study on patients who underwent maxillary canine, premolar, and molar tooth extraction at Istanbul University's Faculty of Dentistry between 2021 and 2023. Ethical standards were approved by the Istanbul University's Faculty of Dentistry Ethical Committee (approval date: 30/07/2024, approval number: 174). This retrospective study analyzes cases in which the PSCTF or BFPF technique was employed to close OAF.
The study population consisted of caucasian patients from Türkiye, aged 18-65 years, with a 50% male and 50% female distribution, with no underlying health conditions that could interfere with the healing process, who developed OAC after posterior maxillary teeth surgery and underwent OAC therapy. The diagnosis of OAC was made by clinical examination and the Valsalva maneuver. Cone-beam Computed Tomography (CBCT) images were taken, and the diagnosis was confirmed. After applying the exclusion criteria (patients with systemic diseases affecting healing or incomplete follow-up), 20 eligible patients were selected. Patients were divided into three age groups (18-30 years, 31-60 years, and >60 years) based on clinically relevant standard grouping commonly used in oral and maxillofacial surgery research. These groupings reflect distinct physiological stages that may impact recovery outcomes. Although every effort was made to match the populations, the limited specification may introduce variability. Patients were randomly assigned to Group I (BFPF) or Group II (PSCTF) using simple randomization. A computer-generated random sequence was used to allocate the 20 eligible patients into two groups of 10 each. Group I underwent OAF closure using a BFPF. Group II underwent closure with a PSCTF. Patients in both groups were exposed to similar surgical techniques, ensuring consistency in procedural conditions. Patient demographics, OAF details (size, location, etiological factors), surgical specifics (technique used, approach, and additional procedures), and postoperative outcomes were recorded.

Surgical Procedure

In Group I, closure of the OAF was performed using the BFPF technique. Following local anesthesia, a circular incision with a 3-mm margin was made around the defect to access the surgical site and excise the epithelial tract and any associated inflamed tissue (Figure 1a). Two vertical incisions were extended into the vestibule to facilitate the reflection of a trapezoidal buccal mucoperiosteal flap, exposing the lateral wall of the maxilla. Further exposure of the buccal fat pad was achieved by making a vertical incision through the periosteum posterior to the zygomatic buttress. External pressure below the zygomatic arch facilitated herniation of the BFP, which was gently extracted and carefully dissected using scissors (Figure 1b). After sufficient length was gained, the BFPF was advanced to cover the oral defect and secured in place using absorbable polydioxanone sutures (Figure 1c). Postoperatively, the fat pad in the oral cavity was left exposed without additional coverage (Figure 1d).
In Group II, incisions for the standard advancement flap in the buccal area were made (3). A full-thickness mucoperiosteal flap was raised. The perforation area was exposed (Figure 2a), and the polypoid and infected tissues within the sinus were excised using a surgical curette. The irregular bone formation was smoothed using a round burr. Multiple perforations were made in the bone tissue surrounding the site using a small round bur (Figure 2b). A linear excision ranging from 1.5 to 2 cm was made in the palatal area, extending towards the posterior region. A partial-thickness mucoepithelial flap was elevated. The subepithelial connective tissue in the fistula region was rotated from front to back (Figure 2c). The wound was closed using a biodegradable suture to secure the tissue to previously established bone perforations. It is crucial to secure the subepithelial connective tissue while maintaining its structural integrity, thickness, and mobility. Finally, the buccal advancement flap, previously prepared on the vestibule side, was mobilized through periosteal incisions and anchored to the palatal mucosa, encompassing the tension-free connective tissue repositioned from the palatal area (Figure 2d).

Postoperatively, patients received comprehensive instructions to prevent complications and facilitate optimal healing. They were advised to refrain from activities that could generate either negative or positive pressure within the sinus cavity, such as using drinking straws, forcefully blowing the nose, or sneezing without covering the mouth. These precautionary measures aimed to minimize the risk of disrupting the surgical site and exacerbating postoperative discomfort.

Additionally, patients were prescribed oral antibiotics (1 gr amoxicillin + clavulanic acid) twice a day for seven days to reduce the risk of infection and promote healing. NSAID analgesics (100 mg flurbiprofen) twice a day for seven days were also administered to manage postoperative pain and discomfort. Furthermore, patients were instructed to use decongestant nasal drops and inhalants to reduce nasal mucosal swelling and facilitate healing. Regular saline mouthwashes were recommended starting 24 hours postoperatively to maintain oral hygiene and minimize the risk of infection. Sutures were removed 10-12 days postoperatively to ensure optimal healing of the surgical site.

Following surgery, a follow-up protocol was implemented to monitor patient progress and assess the effectiveness of the procedures. Scheduled appointments were arranged for the 7th and 30th day post-surgery. During these visits, several parameters were evaluated to comprehensively gauge the patient's response to treatment and identify any potential complications.

Patients underwent thorough assessments to evaluate various aspects of their postoperative experience. Pain, mouth opening, edema, infection, and wound healing were evaluated on the 7th and

30th postoperative day. Pain was assessed using a 10-mm visual analogue scale and divided into four categories: 0 - no pain, 1-3 - mild pain, 3-7 - moderate pain, and 7-10 - severe pain. Edema was evaluated by averaging the values obtained from extraoral measurements of the tragus-pogonium and tragus-subnasale distances before and after surgery, using a tape measure placed on the skin. Mouth opening was assessed by measuring the maximum interincisal distance at each follow-up. Presence of purulent drainage, redness, fistula and positive result of Valsalva maneuver on control days were sings of unsuccessful treatment.

STATISTICAL ANALYSIS

In the power analysis conducted using the G*power 3.1 program for our study, the effect size for the Pain Score between the study groups was found to be 1.18 (alpha error probability = 0.05); in the sample size analysis conducted by taking a power value of 0.8, the minimum required number of samples for each group was found to be 10. Statistical analyses were performed using the NCSS (Number Cruncher Statistical System) 2007 Statistical Software (Utah, USA). In the data evaluation, descriptive statistical methods (mean, standard deviation, median, interquartile range) were used. The distribution of variables was examined using the Shapiro-Wilk normality test. For time comparisons of normally distributed variables, the paired t-test was employed, while one-way analysis of variance (ANOVA) was used for group comparisons. The Tukey multiple comparison test was used for subgroup comparisons. The independent t-test was employed for paired group comparisons, while the Wilcoxon test was used for time comparisons of variables that did not follow a normal distribution. The Mann-Whitney U test was used for paired group comparisons. The results were evaluated at a significance level of $p<0.05$.

RESULTS

A total of 20 patients, with 10 in each group, aged between 18 and 65 years, were included in the study. Demographic data are shown in Table 1.
The statistical analysis revealed no significant difference between the mean pain scores of Group 1 and Group 2 on the 7th and 30th days (p=0.218, p=0.739, respectively). However, the mean pain scores on the 30th day were significantly lower than those on the 7th day for both Group 1 (p=0.005) and Group 2 (p=0.006) (Table 2, Figure 3).

On the 7th day, Group 2 exhibited significantly higher mean mouth opening compared to Group 1 (p=0.001). There was no significant difference in mean mouth opening between Group 1 and Group 2 on the 30th day (p=0.539). However, both Group 1 and Group 2 demonstrated significantly higher mean mouth opening on the 30th day compared to the 7th day (p=0.001, p=0.016, respectively) (Table 2, Figure 4).

Regarding swelling, there was no statistically significant difference between the mean swelling scores of Group 1 and Group 2 in the preoperative (1st day) assessments (p=0.821). However, on the 7th day, Group 2 exhibited significantly lower mean swelling compared to Group 1 (p=0.001). There was no significant difference in mean swelling between the two groups on the 30th day (p=0.770). Notably, for Group 1, a statistically significant difference was observed in mean swelling between the preoperative (1st day), 7th, and 30th days (p=0.0001). The mean swelling on the 7th day was significantly higher than both the preoperative (1st day) and 30th day measurements (p=0.0001), while no significant difference was observed between the preoperative (1st day) and 30th day swelling (p=0.081). Similarly, for Group 2, a significant difference was observed in mean swelling between the 1st, 7th, and 30th days (p=0.0001). The mean swelling on the 7th day was significantly higher than

both the 1st and 30th days (p=0.0001), while no significant difference was observed between the 1st and 30th day mean swelling (p=0.054) (Table 2, Table 3, Figure 5).

No cases of infection or wound dehiscence were observed in either group during follow-up.

DISCUSSION

This study assessed the effectiveness of two techniques for treating OAF compared with conventional buccal flap procedures. A study conducted found no significant differences in surgery duration between the two groups, ensuring consistency in surgical procedures. Flap techniques for OAF treatment can be broadly categorized into local and distant flaps. Although various methods exist, surgeons often prefer buccal flaps, BFPFs, and palatal flaps for larger OAFs (>5 mm). The surgical approach emphasizes adequate sinus drainage and tension-free tissue closure over the intact bone, requiring excision of the sinus pathology and fistula tract before OAF closure [14,15].

Buccal advancement flaps are the first-choice method for managing OAF. However, these flaps, first described by Rehrman, have disadvantages such as reducing vestibular depth and failing in very large defects [16]. To overcome these disadvantages, the BFPF technique, first described by Egyedi et al., which offers better blood supply, is preferred for larger defects [17]. Baumann et al. used the BFPF technique in 29 patients, stating that it was safe in the posterior maxilla and soft palate with minimal donor-site morbidity [18]. In a retrospective study of 20 patients, Shukla et al. compared buccal advancement flaps and BFPF techniques, noting that BFPF had more favorable short- and long-term outcomes. Although BFPF was associated with more visible pain and edema, the differences were not statistically significant. Furthermore, mouth opening limitations seen in BFPF cases during the first two weeks returned to normal afterward, with morbidity being more common in buccal advancement flaps [8].

Palatal flaps used for OAF closure have advantages such as thick keratinized tissue, preservation of vestibule depth, and excellent arterial blood supply. These are preferred for larger defects compared to buccal advancement flaps. However, the thickness of the keratinized tissue can limit the rotation of the flap. Full-thickness palatal flaps also have disadvantages such as exposed palatal bone and the formation of "dog-ear" deformities [19]. To avoid these, the modified submucosal connective tissue flap described by Bergin et al. uses a half-thickness incision in the palatal region, shifting connective tissue to the fistula area without disrupting its blood supply, thus eliminating the "dog-ear" issue [14].

In their retrospective study of 10 patients, Yabroudi et al. compared the PSCTF with the traditional pedicled palatal flap. They found that the modified technique resulted in less discomfort, faster healing, and reduced analgesic use. The absence of an open wound significantly increased postoperative comfort, although the modified technique was technically more challenging [7, 20].

Although studies comparing buccal flaps and palatal flaps exist, no clinical studies have compared the BFP and PSCTF techniques. According to our study's results, both techniques yield similar outcomes in terms of pain, mouth opening, and edema.

However, our study has limitations, including a small sample size, which may affect the generalizability of our findings. The retrospective nature of the study precluded ideal randomization, potentially introducing selection bias. Additionally, our study focused solely on comparing two techniques, and the follow-up period was relatively short, leaving postoperative rehabilitation unaddressed.

CONCLUSION

In conclusion, both the PSCTF and BFP techniques can be used safely in the treatment of extensive OAC. Although neither technique showed superiority over the other in the long term, BFP was associated with slightly higher edema in the short term, while patients who underwent the PSCTF experienced slightly more pain.

Tables

Age Group (years)	Group 1 N=10	Group 2 N=10	Total N=20
18-30	6	4	10
31-60	4	5	9
>60	0	1	1

Table 1. Age of Study Population Between the Groups

			Group 1	**Group 2**	**p**
		Mean±SD	2.80±1.03	3.40±0.84	
	7th	**Median (IQR)**	3 (2-4)	3 (3-4)	0.218‡
		Mean±SD	0.21±0.42	0.30±0.48	
	30rd	**Median (IQR)**	0 (0-0.25)	0 (0-1)	0.739‡
Pain Skor	**p†**		**0.005**	**0.006**	
	7th	**Mean±SD**	32.10±2.60	36.30±2.06	**0.001***
	30rd	**Mean±SD**	37.90±2.13	38.40±1.35	0.539*
Mouth Opening	**p‡**		**0.001**	**0.016**	
Swelling	**1st**	**Mean±SD**	10.67±0.72	10.77±1.17	0.821*

	7th	**Mean±SD**	12.96±0.55	11.26±1.13	**0.0001***
	30rd	**Mean±SD**	10.73±0.73	10.86±1.17	0.770*
	p‡		**0.0001**	**0.0001**	

*** Independent t-test ‡Mann-Whitney U test †Wilcoxon signed-rank test ⁑Paired t-test ǂPaired one-way analysis of variance**

Table 2. Statistical analysis of pain score, mouth opening and swelling values.

Newman-Keuls multiple comparison test	**Swelling**	
	Group 1	**Group 2**
1 st /7 th	**0.0001**	**0.0001**
1 st / 30 rd	0.081	0.054
7 th / 30 rd	**0.0001**	**0.0001**

Table 3. Multiple comparisation of swelling between groups.

Figures

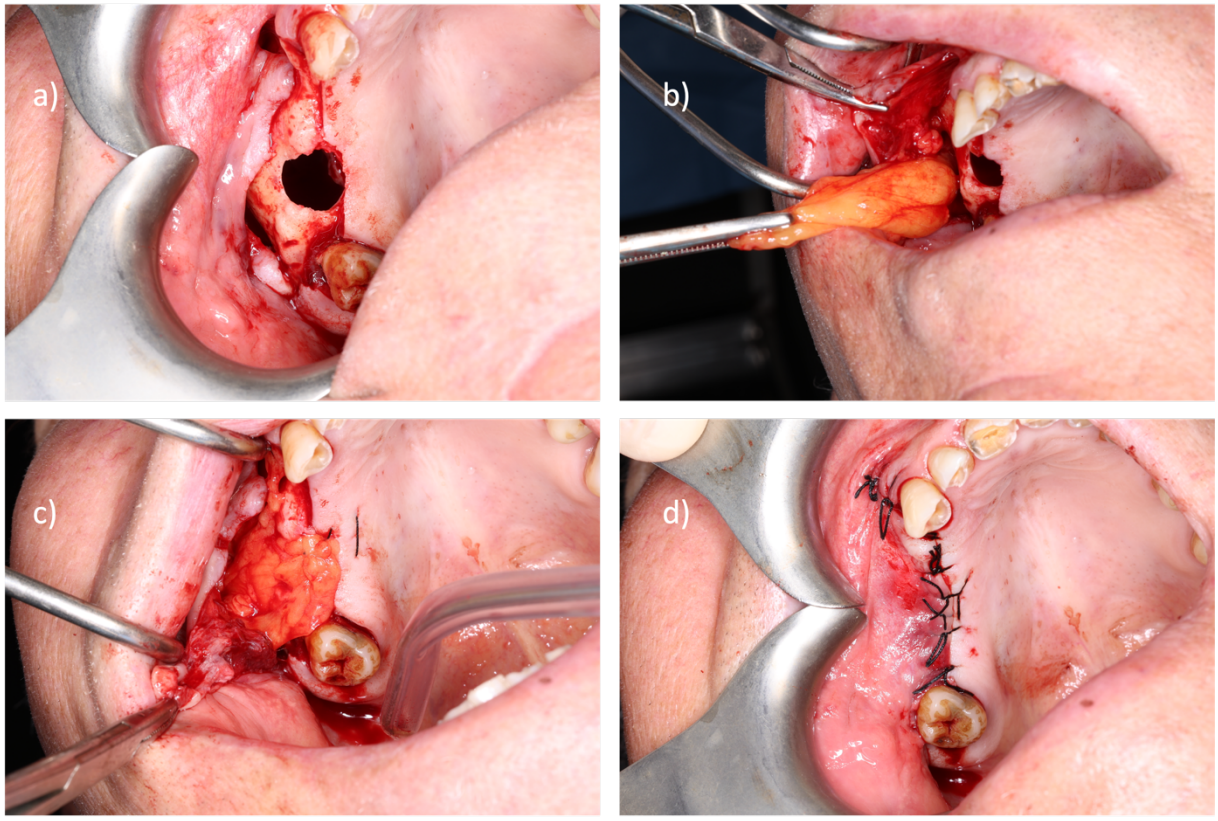

Figure 1. intraoral photographs taken during OAF closure operation using BFPF technique. An incision similar to the buccal flap technique was made to access the surgical site (Figure 1a) The periosteum was incised behind the zygomatic buttress to expose the BFP, which was manipulated by applying extraoral pressure below the zygomatic arc(Figure 1b). The BFP was sutured to the adjacent palatal tissue to cover the fistula adequately (Figure 1c). Sutures were meticulously placed to secure the fat pad over the bony defect, and the mucoperiosteal flap was replaced in its original position to ensure proper closure(Figure 1d).

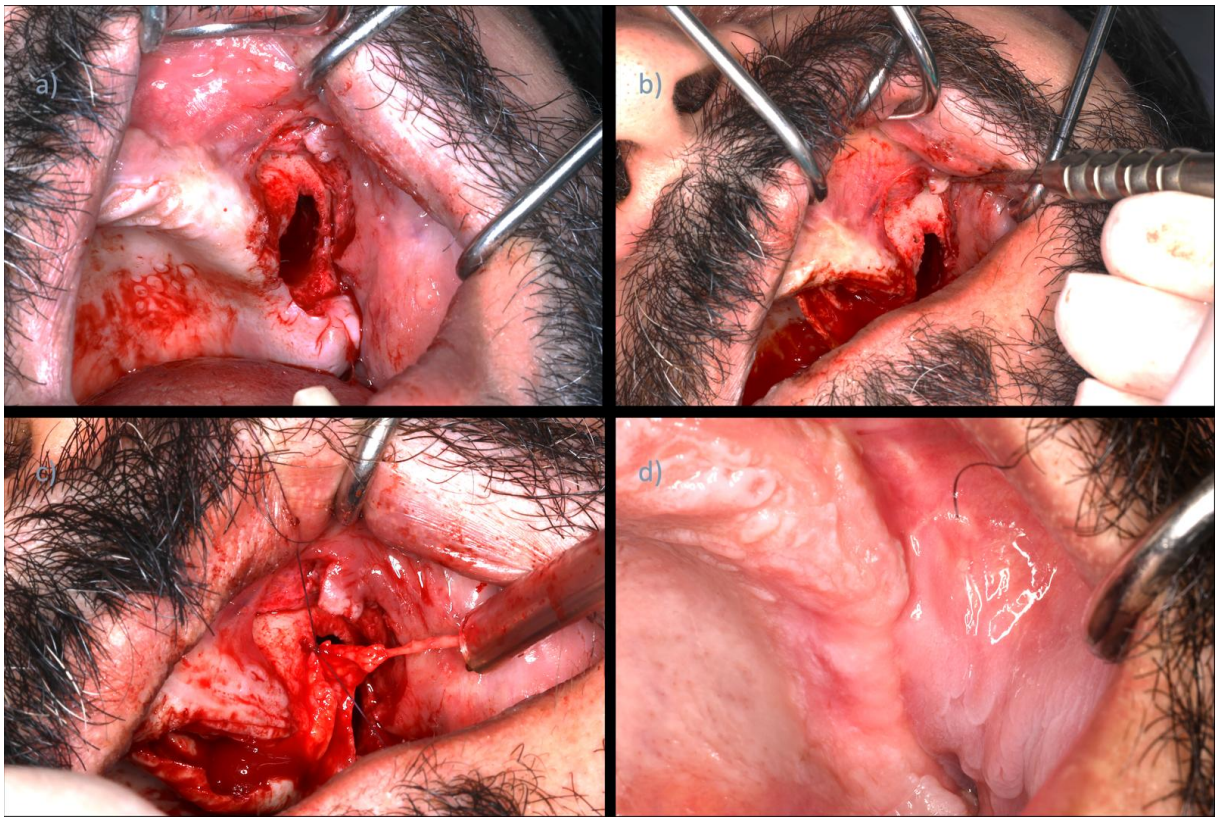

Figure 2. intraoral photographs taken during OAF closure operation using PSCTF technique. Full-thickness mucoperiosteal flap was raised. The perforation area was exposed (Figure 2a), Multiple perforations were created in the bone tissue surrounding the site by using a small circular bur (Figure 2b), The subepithelial connective tissue in the fistula region, which lacked teeth, experienced rotational movement from the front to the back (Figure 2c), The buccal advancement flap, which had been previously prepared on the vestibule side, was successfully mobilized through periosteal incisions and anchored to the palatal mucosa by encompassing the tension-free connective tissue that had been repositioned from the palatal area (Figure 2d).

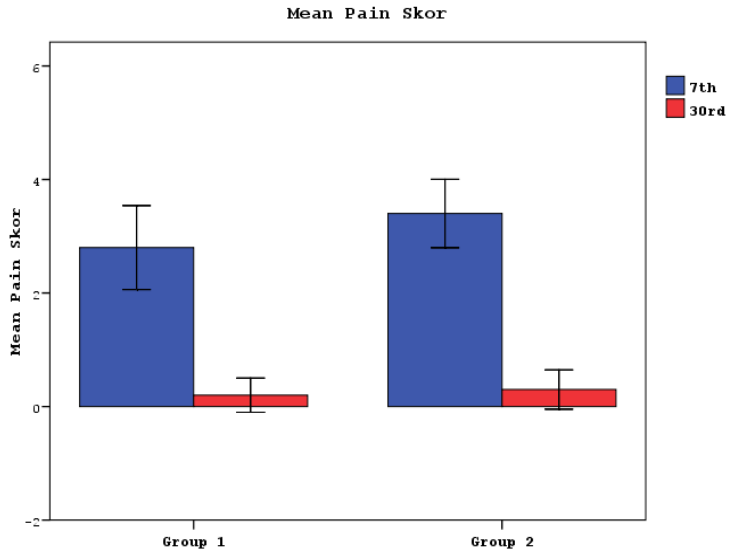

Figure 3. Mean Pain Score Graphics between groups

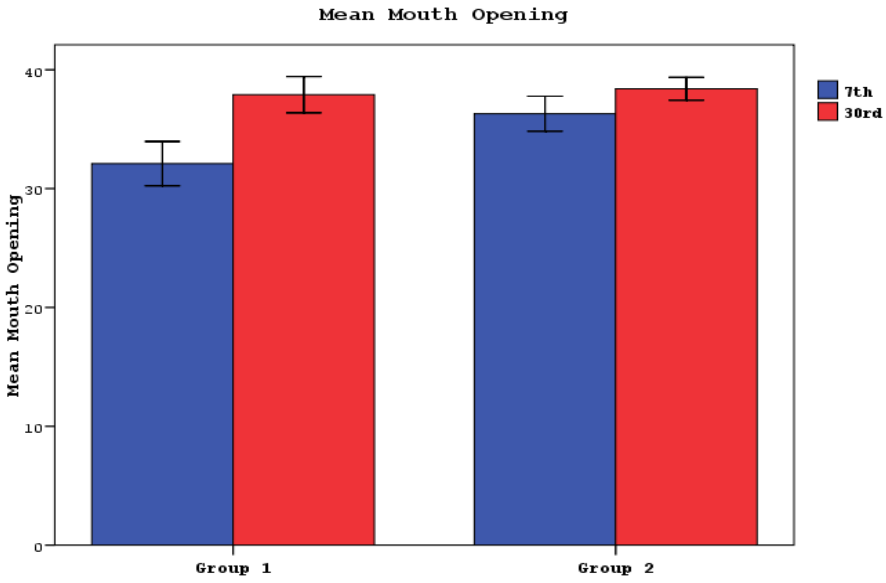

Figure 4. Mean Mouth Opening graphics between groups.

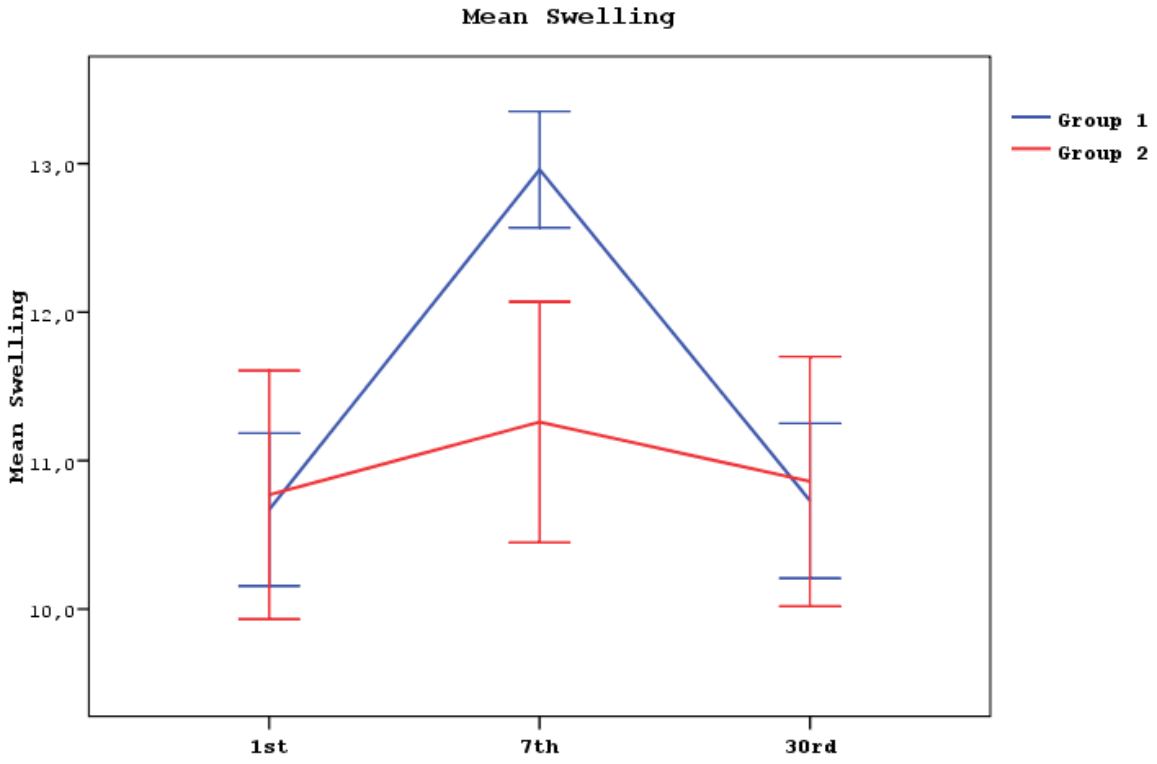

Figure 5. Mean swelling graphics between groups.

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