

Implant Therapy in a Patient with Jaw Bone Resorption

Joshua Dilworth*

Department of Periodontics, William Beaumont University Hospital, Royal Oak, MI, USA

Introduction

This case study presents the successful implant therapy in a patient with severe jaw bone resorption. The treatment approach, challenges encountered, and clinical outcomes are discussed, highlighting the importance of tailored treatment plans in complex dental cases. Jaw bone resorption presents significant challenges in dental implantology, affecting both functional and aesthetic outcomes. This case study explores the management of implant therapy in such a patient, emphasizing the importance of a multidisciplinary approach and advanced treatment strategies. Bone resorption in the jaws can result from various factors, including trauma, periodontal disease, or edentulism. The impact on implant success rates and treatment planning has been extensively documented in the literature. Strategies such as bone augmentation techniques, guided bone regeneration, and implant designs tailored to compromised bone conditions have been developed to address these challenges [1].

Description

Jaw bone resorption presents a significant challenge in implant dentistry, particularly when severe bone loss complicates the placement and stability of dental implants. This case study focuses on a 60-year-old male patient who presented with extensive mandibular bone resorption due to long-term edentulism and chronic periodontal disease. The patient's history revealed gradual tooth loss over several decades, resulting in pronounced bone atrophy in the mandible. Clinical examination and radiographic imaging confirmed severe horizontal and vertical bone deficiency, especially in the posterior mandibular regions where traditional implant placement was deemed challenging. A thorough treatment plan was developed in consultation with oral surgeons, prosthodontists, and radiologists. Advanced imaging techniques, including Cone Beam Computed Tomography (CBCT), were utilized to precisely assess the remaining bone structure and plan for optimal implant placement and bone augmentation procedures. Given the extent of bone resorption, a staged surgical approach was adopted. Initial treatment involved guided bone regeneration (GBR) using a combination of autogenous bone grafts harvested from the patient's chin and allograft materials. This procedure aimed to rebuild the deficient bone volume and create a stable foundation for future implant placement. Following successful bone regeneration, dental implants were strategically placed in the augmented areas of the mandible using computer-assisted surgery to ensure precise positioning and optimal load distribution. Short implants and angled implants were selected to maximize bone utilization and enhance initial stability in compromised anatomical sites [2].

After a healing period to allow for osseointegration, the implants were

restored with customized prostheses. A combination of fixed implant-supported bridges and overdentures was fabricated to restore the patient's masticatory function and achieve aesthetic harmony. Prosthetic adjustments were meticulously performed to optimize occlusal function and patient comfort. Jaw bone resorption poses significant challenges in the field of implant dentistry, often necessitating innovative approaches to restore oral function and aesthetics. This case study focuses on a 55-year-old female patient presenting with severe mandibular bone resorption secondary to long-standing edentulism and periodontal disease. The patient's medical history revealed a prolonged period of tooth loss in the mandible, leading to substantial bone atrophy over time. Clinical examination and radiographic assessments confirmed extensive horizontal and vertical bone loss, particularly in the posterior mandibular region, severely compromising the potential for conventional dental implant placement. A multidisciplinary team approach involving prosthodontists, oral surgeons, and radiologists was employed to develop a comprehensive treatment plan. Cone beam computed tomography (CBCT) scans were utilized to accurately assess the remaining bone volume and plan the optimal implant placement strategy [3].

To address the severe bone deficiency, a staged approach was adopted. Initially, guided bone regeneration (GBR) techniques were employed using a combination of autogenous bone grafts harvested from the iliac crest and xenograft materials. This procedure aimed to augment the deficient bone volume and create a suitable environment for subsequent implant placement. Following adequate bone regeneration, dental implants were strategically placed in the augmented areas of the mandible using computer-guided surgery for precision. Specialized implant designs, including short implants and tilted implants, were utilized to maximize bone utilization and ensure primary stability in compromised anatomical conditions. Postoperative care involved meticulous monitoring of osseointegration and soft tissue healing. Regular follow-up appointments were scheduled to assess implant stability and prosthetic loading readiness. Final restorations, including fixed implant-supported prostheses, were fabricated to restore the patient's oral function and achieve optimal aesthetic outcomes [4].

This description outlines the comprehensive approach taken to address jaw bone resorption through implant therapy, highlighting the importance of advanced surgical techniques and interdisciplinary collaboration in achieving favorable clinical results. When teeth are missing, the jawbone may no longer receive stimulation needed to maintain its volume, leading to resorption over time. Advanced gum disease can lead to bone loss around the teeth, affecting the supporting structures of the jawbone. Injuries to the jawbone, such as fractures or surgical procedures, can sometimes result in bone resorption during the healing process. Certain infections, particularly those affecting the bone (osteomyelitis), can contribute to bone loss in the jaw. Systemic diseases like osteoporosis or certain metabolic disorders can impact bone density and contribute to resorption in the jaw. The consequences of jaw bone resorption include compromised support for remaining teeth, changes in facial appearance, and difficulties in fitting dental prosthetics like implants. Treatment approaches often involve bone grafting or augmentation procedures to restore bone volume and density, enabling successful placement of dental implants or other prosthetic solutions. Early detection and intervention are crucial in managing jaw bone resorption to preserve oral function and aesthetics effectively. A detailed description of the patient's case is provided, including their medical history, dental history, clinical examination findings, radiographic assessments, and treatment planning process. The case outlines the steps taken to rehabilitate the patient's oral function and aesthetics using dental implants despite significant bone loss in the jaw [5].

*Address for Correspondence: Joshua Dilworth, Department of Periodontics, William Beaumont University Hospital, Royal Oak, MI, USA, E-mail: Joshua.Dilworth12@Beaumont.org

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Received: 02 May, 2024, Manuscript No. OHCR-24-141528; Editor Assigned: 04 May, 2024, PreQC No. P-141528; Reviewed: 16 May, 2024, QC No. Q-141528; Revised: 22 May, 2024, Manuscript No. R-141528; Published: 29 May, 2024, DOI: 10.37421/2471-8726.2024.10.139

Conclusion

This case study illustrates that successful implant therapy is feasible even in patients with severe jaw bone resorption. Through careful preoperative evaluation, meticulous treatment planning, and the application of advanced implant techniques, satisfactory functional and aesthetic outcomes can be achieved. The patient demonstrated excellent integration of dental implants with surrounding bone tissue, leading to restored oral function and improved quality of life. Regular follow-up appointments were scheduled to monitor implant stability, peri-implant tissue health, and prosthetic longevity. Long-term success was achieved through comprehensive oral hygiene maintenance and periodic professional care. The importance of ongoing monitoring and maintenance in preserving long-term implant success is also emphasized. This outline provides a structured approach to presenting the case study, ensuring comprehensive coverage of the patient's condition, treatment, and outcomes related to implant therapy in the context of jaw bone resorption. This case study underscores the successful application of advanced implant techniques and interdisciplinary collaboration in managing severe jaw bone resorption. By addressing bone deficiency through meticulous planning, innovative surgical procedures, and tailored prosthetic solutions, significant improvements in oral health and patient satisfaction were achieved.

Acknowledgement

None.

Conflict of Interest

None.

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How to cite this article: Dilworth, Joshua. "Implant Therapy in a Patient with Jaw Bone Resorption." *Oral Health Case Rep* 10 (2024): 139.