

Implant rehabilitation following the resection of medication-related osteonecrosis of the jaw (MRONJ)

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Medication-related Osteonecrosis of the Jaw (MRONJ) poses a significant challenge in dental practice due to its severe impact on oral health. This case report presents a successful implant rehabilitation following wide resection of MRONJ in a single patient. After meticulous removal of necrotic bone and inflammation, bone grafting was performed, followed by the successful placement of dental implants. This case highlights the effectiveness of a comprehensive treatment approach, emphasizing the importance of inflammation removal, bone grafting, and precise implant placement in achieving successful implant rehabilitation after MRONJ-related wide resection. The successful outcome demonstrates the significance of integrating rhPTH therapy in achieving optimal implant rehabilitation after MRONJ-related wide resection. (THE JOURNAL OF KOREAN ACADEMY OF OSSEOINTEGRATION 2023;15(1):18-21)

Key words: MRONJ, Implant, rhPTH

INTRODUCTION

Medication-related Osteonecrosis of the Jaw (MRONJ) is a debilitating condition, often necessitating extensive surgical intervention for effective management¹. In this case report, we present a compelling instance of successful implant rehabilitation following wide resection of MRONJ. MRONJ, associated with prolonged bisphosphonate use, led to extensive necrosis and inflammation in the patient's jawbone. The treatment approach involved meticulous removal of necrotic tissue and inflammation, followed by grafting the affected area to promote optimal bone healing. Subsequently, dental implants were placed with precision, ensuring stable and functional oral rehabilitation.

The primary objective of this case report is to shed light on the intricate process of managing MRONJ and demonstrate the successful outcome achievable through a combination of wide resection, inflammation removal, bone grafting, and dental implant placement. This approach not only addresses the immediate concerns related to MRONJ but also provides a foundation for long-term oral health and improved quality of life for the patient.

There is currently no established guideline in the form of a research paper regarding the possibility of implant placement after the resolution of medication-related osteonecrosis of the jaw (MRONJ)^{1,2}. Medication-related Osteonecrosis of the Jaw (MRONJ) poses a multifaceted dilemma in dental care, requiring a sophisticated strategy to tackle the substantial necrosis and inflammation associated with the condition³. This case report emphasizes the vital importance of a careful treatment approach post wide resection, concentrating on eliminating inflammation, conducting bone grafting, and ensuring accurate implant placement. These findings offer valuable guidance for dental practitioners dealing with patients affected by MRONJ.

CASE REPORT

A 74-year-old female patient was referred to our clinic from a local dental practitioner due to a maxillary osteolytic lesion. Clinically, the patient exhibited gingival pain & swelling, and pus formation in the left maxillary region, along with mobility of the anterior crown and bridge prosthesis. Radiographic examinations, including panoramic and cone-beam computed tomogra-

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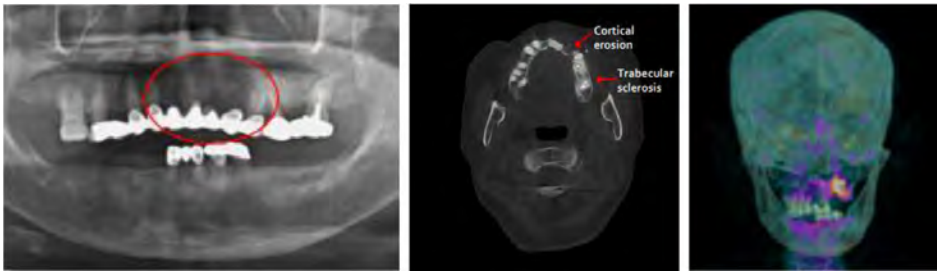


Figure 1. The radiological condition of a first-visit patient.

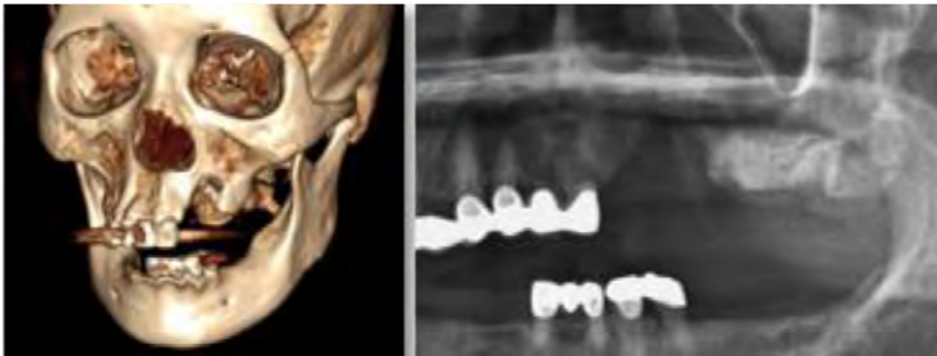


Figure 2. Confirmation of patient's radiological condition 8 months following sequestrectomy surgery.

phy (CBCT), revealed radiolucent lesions in the maxillary bone. To further assess the lesion, a bone SPECT-CT scan was performed (Figure 1). The patient's medical history indicated a 10-year history of Alendronate (oral) and Risedronate (oral) use for osteoporosis, which was switched to Denosumab (intravenous) a year ago. Additionally, the patient had a history of hypertension and stroke.

The patient was diagnosed with Stage III Medication-related Osteonecrosis of the jaw in the left maxilla, confirmed through a bone scan conducted at our clinic to determine the location and extent of the lesion. The ultimate goal was the removal of the necrotic area and oral reconstruction, which was achieved through a three-step treatment approach. Firstly, Frontal Endoscopic Sinus Surgery (FESS) and Resection of the MRONJ lesion were performed, accompanied by MRONJ management through rhPTH injection. Secondly, after 8 months of post-operation observation without recurrence or expansion of MRONJ, Bone Augmentation with A-oss and Extraction of adjacent hopeless teeth were conducted (Figures 2, 3). Finally, following confirmation of stabilization 5 months after the bone graft surgery, implant placement (TS III SOI, Osstem, OneGuide Kit or OneMS Kit, Osstem Global Co., Ltd.) was carried out using a digital guided system (Figure 4). And The prosthesis was completed after 7 months.

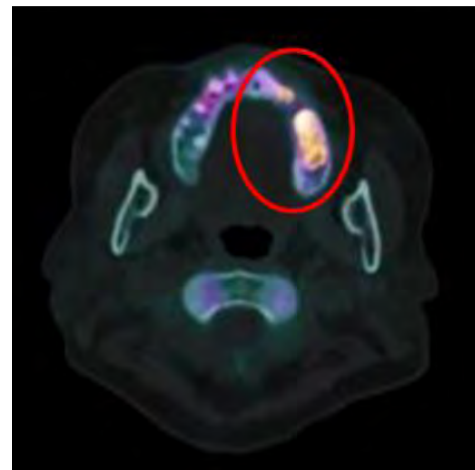


Figure 3. On postoperative day 8 months, the radiological assessment of the surgical site was conducted through Bone SPECT CT imaging. The results revealed decreased intensity at the surgical site, accompanied by gross residual uptake in a known bone lesion located at the maxillary alveolar process.

DISCUSSION

The presented case exemplifies the significance of a multidisciplinary approach in the successful rehabilitation of MRONJ-affected patients. It is essential to undertake a thorough approach, including extensive resection and precise elimination of inflammation, to halt the disease's progression and establish an ideal environment for subsequent interventions⁴. Bone grafting plays a

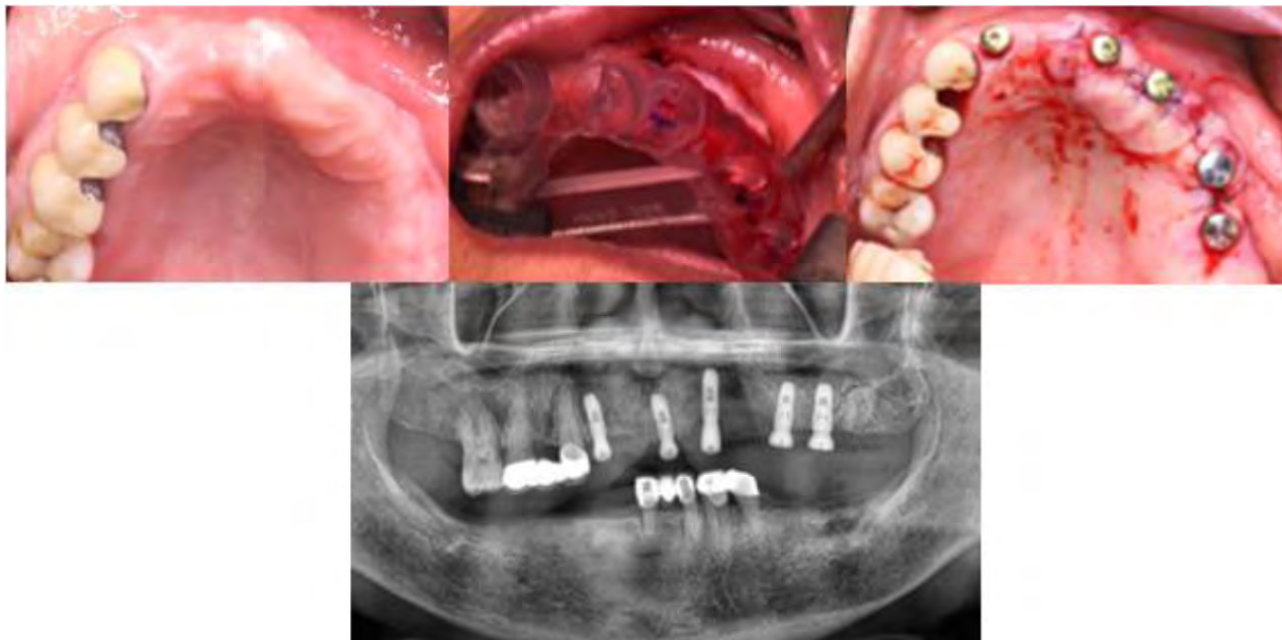


Figure 4. Implantation and bone grafting procedure performed using guided surgery (Osstem oneguide system).

pivotal role in restoring the structural integrity of the jawbone, creating a foundation robust enough to support dental implants⁵.

The precise placement of dental implants is a crucial aspect of the rehabilitation process. It ensures not only the functional aspects of oral health, such as chewing and speech, but also contributes significantly to the patient's psychological well-being by restoring their smile and confidence^{6,7}. Continued monitoring through regular follow-ups and detailed post-operative care is crucial to assess implant integration and promptly manage any potential complications, as emphasized in the scholarly literature⁸⁻¹⁰.

The placement of dental implants in patients undergoing bisphosphonate treatment lacks unanimous consensus in the literature. Despite this, published studies indicate no definitive contraindications for implant placement while patients are orally administered bisphosphonates¹¹. Several authors have reported positive outcomes with dental implants in conjunction with antiresorptive therapy, including extensive patient series where implants were successfully placed, experiencing minimal failures or none at all¹¹⁻¹⁵. Notably, no elevated risk of medication-related osteonecrosis of the jaw (MRONJ) has been observed concerning dental implant procedures in these cases. Madrid and Sanz's research findings indicate that undergoing dental procedures, including dental implant insertion, while orally taking bisphosphonates for less than five years appears to be safe¹⁶.

Some reports even fail to mention the occurrence of medication-related osteonecrosis of the jaw (MRONJ) in patients with implants after bisphosphonate usage¹⁷. However, due to the diverse nature of the studies available, there is insufficient published evidence to establish definitive conclusions regarding the insertion of implants in patients undergoing antiresorptive medication treatment or its relation to MRONJ¹¹.

In conclusion, this case report underscores the feasibility of successful implant rehabilitation following wide resection of MRONJ, emphasizing the integration of rhPTH therapy alongside inflammation removal, bone grafting, and precise implant placement. This innovative approach offers a promising avenue for MRONJ-affected patients, providing them with restored quality of life, oral function, and confidence. Continued research and collaboration among dental and medical professionals are crucial to further refine treatment protocols, making the most of rhPTH and other advanced biomaterials, and ultimately enhancing the overall quality of care for individuals challenged by MRONJ-related complications^{18,19}.

Additionally, ongoing research initiatives focused on the development of advanced biomaterials and Specialized implant technologies designed for MRONJ-affected patients show potential in significantly improving the long-term outcomes of implant rehabilitation^{4,20}. These advancements hold the promise of transforming the field, providing solutions that are not only more effi-

cient but also patient-friendly, thereby enhancing the overall quality of care for individuals dealing with challenges related to MRONJ.

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