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CASE REPORT

Osteonecrosis of the Jaw in a Young Patient: Beyond Medication-Related Causes

Genç Bir Hastada Çene Osteonekrozu: İlaçla İlgili Nedenlerin Ötesinde

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ABSTRACT

Medication-Related Osteonecrosis of the Jaw (MRONJ) is commonly associated with pharmacological agents like bisphosphonates. However, osteonecrosis can also develop due to other etiologies, including dental trauma and infections. This case report describes osteonecrosis in a 26-year-old male patient who underwent simultaneous implant placement and surgical tooth extraction. The absence of systemic diseases or medication history highlights the role of dental trauma and impaired healing in osteonecrosis development. Management included surgical debridement and antibiotic therapy, consistent with Stage 2 osteonecrosis guidelines. The case emphasizes the importance of minimizing trauma during dental procedures to prevent osteonecrosis, even in younger patients.

Keywords: dental implant, MRONJ, osteonecrosis, trauma

ÖZET

İlaca Bağlı Çene Osteonekrozu (MRONJ), genellikle bifosfonatlar gibi farmakolojik ajanlarla ilişkilendirilse de, dental travma ve enfeksiyonlar gibi diğer etiyolojik faktörlere bağlı olarak da gelişebilmektedir. Bu vaka raporu, eş zamanlı implant yerleştirilmesi ve cerrahi diş çekimi uygulanan 26 yaşındaki bir erkek hastada gelişen osteonekrozu ele almaktadır. Hastanın sistemik bir hastalık veya ilaç kullanım öyküsünün bulunmaması; osteonekroz gelişiminde dental travma ve bozulmuş iyileşme sürecinin etkisini ön plana çıkarmaktadır. Tedavi, Evre 2 osteonekroz kılavuzları doğrultusunda, cerrahi debridman ve antibiyotik uygulaması ile gerçekleştirilmiştir. Çıkarılan materyalin histopatolojik incelemesi, osteonekroz tanısını doğulamıştır. Bu vaka, genç hastalarda dahi osteonekrozu önlemek için dental işlemler sırasında travmayı en aza indirmenin önemine dikkat çekmektedir.

Anahtar Kelimeler: dental implant, MRONJ, osteonekroz, travma

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INTRODUCTION

Osteonecrosis of the jaw (ONJ) is a growing concern in dentistry, commonly associated with medications like bisphosphonates, but can also result from other causes, including dental trauma, infections, and radiation therapy. Medication-Related Osteonecrosis of the Jaw (MRONJ) specifically arises after the use of antiresorptive drugs and antiangiogenic therapies[1], and often following oral surgeries like tooth extractions.[2] Robert E. Marx was the first to disclose ONJ, publishing the study on the adverse effect seen in bone metastases of cancers treated with bisphosphonates in 2003.[3] The American Association of Oral and Maxillofacial Surgeons (AAOMS) redefined the condition in 2014 to include other medications beyond bisphosphonates.[4,5]

Dental implant placement is a common treatment for tooth loss, especially in younger patients.[6] While the surrounding bone is expected to remain healthy, trauma from the procedure can disrupt bone metabolism, potentially leading to complications such as ONJ.[7] This case report discusses a 26-year-old male who developed ONJ following implant placement, without prior medication or systemic disease.

CASE REPORT

A 26-year-old male patient presented with exposed bone and purulent discharge around a dental implant placed at an external clinic (Figure 1). The implant procedure included simultaneous extraction of an impacted tooth13.The patient reported no systemic diseases or medication use. Radiographic examination revealed significant bone loss and sequestrum formation around the implant. In addition, a slightly radiopaque area was observed in the upper region of the implant (Figure 2).

Treatment involved implant removal, surgical debridement, and wound closure. The extracted materials were sent to the Department of Oral Pathology. Histopathological examination revealed dense mixed type inflammation within the connective tissue, microorganism colonies, necrotic debri, along with devitalized bone trabeculae lacking viable osteocytes in the lacunae (Figure 3). In histochemical studies, Brown-Brenn staining revealed the presence of gram-positive bacteria. No actinomyces colonies were identified in the Light Green PAS staining.

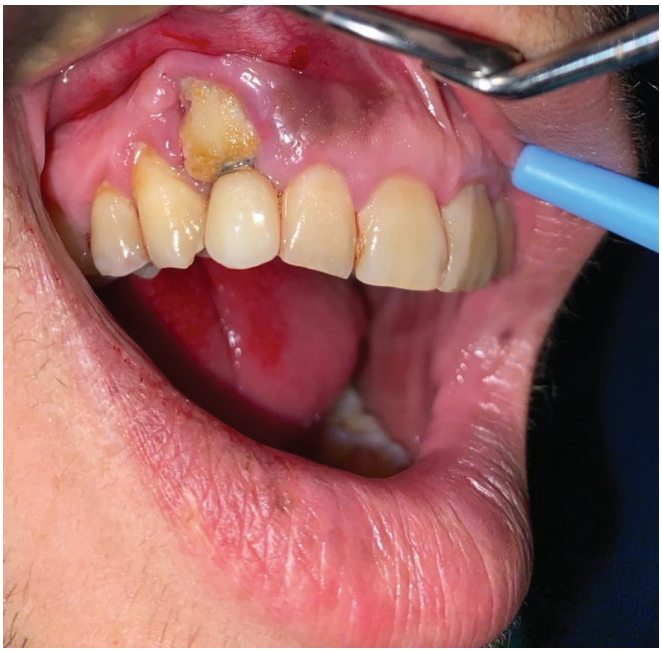

Figure 1. Intraorally, exposed bone and purulent discharge were seen around the implant site, attributed to the absence of tooth 13.

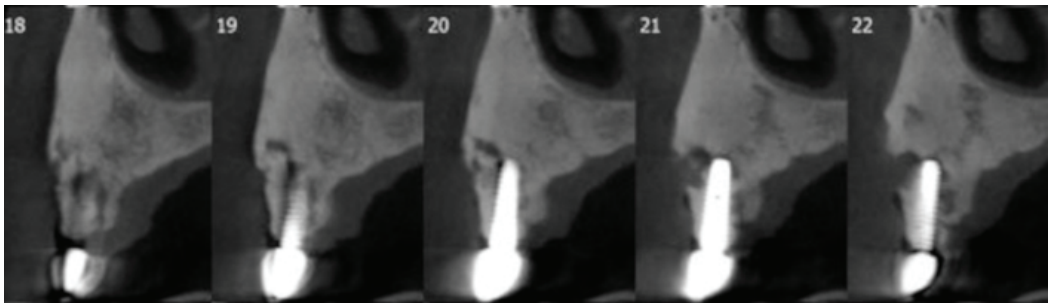

Figure 2. In CBCT, it was noted that significant bone loss and sequestrum formation around the implant.

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The diagnosis of Stage 2 ONJ was established based on bone exposure and discharge. The patient is currently undergoing antibiotic treatment and is in the process of waiting for the affected area to heal.

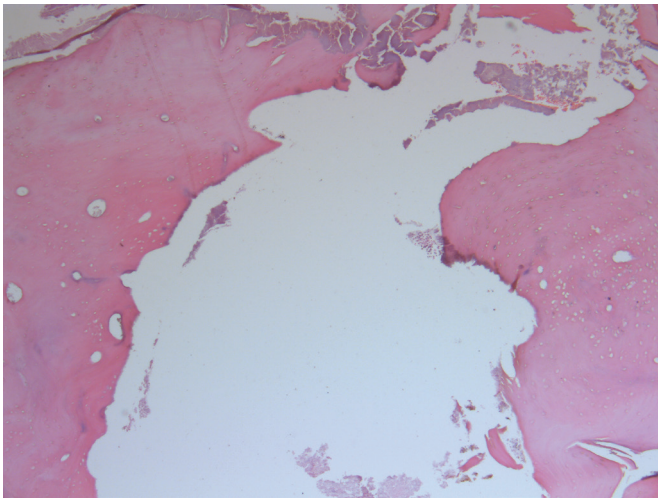

Figure 3. In histopathological examination microorganism colonies, necrotic debri, along with devitalized bone trabeculae lacking viable osteocytes in the lacunae were seen (Hematoxylin&eosin, x40 magnification)

DISCUSSION

Since 2003, osteonecrosis of jaw has been associated with bisphosphonates (BRONJ)[8] was then modified to incorporate other drugs, and in 2014 it was renamed (MRONJ).[5] However, similar clinical presentations can occur without antiresorptive medication use, with reported causes including infections, trauma, smoking, and systemic conditions like diabetes and chemotherapy.[1,5] In our case, dental trauma during implant placement likely triggered ONJ.[9] Studies show ONJ can occur after tooth extraction without medication.[10] The American Association of Oral and Maxillofacial Surgeons has identified dental implant placement as a potential risk factor for osteonecrosis[5], though more research is needed to quantify this risk. The patient's young age contrasts with the typical presentation of MRONJ, which predominantly affects older individuals receiving long-term antiresorptive therapies.[5]

Necrotic areas in ONJs often contain Actinomyces, gram-positive bacteria, and sometimes Candida species.[8] In our case, Brown-Brenn staining revealed gram-positive bacteria, while Light Green PAS staining showed no Actinomyces colonies. Bacterial infection is a key factor in post-traumatic ONJs development and should be considered critically in such cases.[8] It appears that the radiopaque area observed in the upper region of the implant in this case is attributable to a bacterial infection. Furthermore, the fact that the implant was placed in an external centre may be the main cause of bacterial infection, as sterilization rules are not followed in most centres.

Management aligned with AAOMS guidelines for Stage 2 osteonecrosis, focusing on infection control, surgical debridement, and wound closure. This case underscores the importance of minimizing trauma and ensuring optimal healing during dental implant procedures, even in low-risk patients.[5] In the differential diagnosis of osteonecrosis of the jaw, conditions such as chronic osteomyelitis, neoplastic lesions, odontogenic infections, and osteoradionecrosis or Paget's disease should be considered.[1] Osteomyelitis can resemble osteonecrosis with symptoms like bone sequestration, pain, and discharge, but it usually involves more diffuse bone damage, fever, and a history of infection. In our case, the localized bone exposure, absence of systemic symptoms, and histopathological findings of devitalized bone with gram-positive bacterial colonization support the diagnosis of ONJ rather than osteomyelitis. Moreover, there was no history of systemic conditions or medication use that could predispose the patient to other causes of osteonecrosis, such as MRONJ or osteoradionecrosis.[9]

The patient's young age and absence of systemic risk factors emphasize the role of local factors such as osseointegration failure and bacterial colonization, as confirmed by histopathological findings. While osteonecrosis predominantly affects the mandible due to its reduced blood supply, the maxillary occurrence in this case highlights the impact of procedural trauma.[9]

In conclusion, regardless of the patient's age, care should be taken to minimize trauma during dental implant placement, and attention should be paid to ensuring optimal healing of the area.

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