


**EXPLANTATION BY OSTEONECROSIS AFTER WISDOM TOOTH EXTRACTION** <https://doi.org/10.56238/sevened2024.031-048>

**José Eudes Protázio de Oliveira<sup>1</sup>, Vilton Zimmermann de Souza<sup>2</sup>, Gabriel Baldissera de Souza<sup>3</sup>, Taysnara Ismaeley de Andrade<sup>4</sup>, Eduardo Panceri Vieceli<sup>5</sup>, Fábio Castanha Figueiredo<sup>6</sup>, Gislaine Felipe Garcia<sup>7</sup> and Rafael Manfro<sup>8</sup>**

**ABSTRACT**

Osteonecrosis, defined as the death of bone tissue due to lack of blood supply, is a pathological condition that, associated with predisposing factors, can affect the gnathic bones, exacerbating the inflammatory process due to the wide oral microbiota, and can significantly affect the quality of life of patients. Patients with skeletal disorders that induce bone loss, such as osteoporosis, make continuous use of antiresorptive drugs in order to alter bone remodeling. The objective of this study is to describe a case report of the treatment of osteonecrosis of the jaws induced by denosumab, discussing clinical-pathological aspects of the disease. This article highlights the case of patient R.S.B.K., 78 years old, who was affected by breast cancer, for whom she underwent chemotherapy treatment for 5 years. He suffered a pathological rib fracture, where he started treatment with an anti-resorptive drug called Denosunab. After dental extraction of element 28, a local infectious inflammatory process involving adjacent implants began, which culminated in unsuccessful surgical interventions. After the end of the half-life of the medication, the return of tissue functions was observed, evolving with bone coverage by the oral mucosa. It is concluded that the correct and early diagnosis is essential, combined with a resolute treatment through a conservative approach, improving the quality of life of patients.

**Keywords:** Antiresorption. Denosumab. Bisphosphonate-associated osteonecrosis. Bone resorption.

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<sup>1</sup> Master in Implant Dentistry  
São Leopoldo Mandic

<sup>2</sup> Master in Implant Dentistry  
São Leopoldo Mandic

<sup>3</sup> Undergraduate student in dentistry  
Unoesc

<sup>4</sup> Oral and Maxillofacial Specialist  
HRA/PE

<sup>5</sup> Specialist in implant dentistry  
Instituto Orbis

<sup>6</sup> Master in Implant Dentistry  
São Leopoldo Mandic

<sup>7</sup> Master in Implant Dentistry  
São Leopoldo Mandic

<sup>8</sup> Master in Implant Dentistry  
São Leopoldo Mandic



## INTRODUCTION

Defined as "death of bone tissue due to lack of blood supply", osteonecrosis or aseptic necrosis is a pathological condition associated with predisposing factors such as the use of medications, radiotherapy therapies, alcoholism, and idiopathic alterations <sup>1,2</sup>.

Studies show that this pathology is often associated with long bones, affecting the femur with a high incidence, followed by gnathic bones, whose inflammatory processes are exacerbated by a wide microbiota presented in the oral cavity <sup>2,3</sup>.

In gnathic bones, osteonecrosis is more commonly present in the mandible, since it has anatomical and physiological characteristics that give it a lower blood supply and greater bone density, being affected in 65% of the cases to the detriment of the maxilla with 26% <sup>4,5</sup>.

Osteonecrosis with continuous use drugs, such as antiresorptive drugs (bisphosphonates and denosomab) and antigens, are used in patients with skeletal disorders that induce bone loss or metastases associated with primary tumor <sup>6,20</sup>.

Although they are drugs that inhibit osteoclast function and consequent decrease in bone remodeling, bisphosphonates and denosumab have different mechanisms of action, since the latter is an antibody and thus has a better distribution throughout the bone space, thus presenting advantages in treatment, especially in postmenopausal osteoporosis <sup>6,7</sup> element.

Another difference observed is related to the potential for osteonecrosis formation, where studies show that patients submitted to extraction using bisphosphonates had poor bone remodeling, while denosumab, being an antibody, is transient, and as long as it is suspended, it is capable of allowing bone remodeling, since its half-life is short <sup>8,9</sup> element.

The epidemiological profile of osteonecrosis of the jaws is uncertain, since its frequency is related to the duration of drug use, the molecule of origin, the dosage, and the route of administration. In relation to gender, it is more frequent in women, due to hormonal factors <sup>10,11</sup>.

It can be stated that the highest prevalence is in patients who use bisphosphonates with intravenous administration (0.10%), when compared to oral use with 0.001% of the total cases <sup>11,12</sup>.

The diagnosis in most cases is related to the signs and symptoms found and associated with the history of antiresorptive drug use <sup>12</sup>. Sometimes, it is necessary to use imaging tests such as radiographs or computed tomography, in order to measure the degree of extension and quality of remaining healthy bone <sup>12,13</sup>. Usually, after the sequelae caused by the loss of the implant, they trigger aesthetic limitations and also from the



biomechanical point of view<sup>21</sup>.

The main clinical feature associated with osteonecrosis includes an area of ulcerated mucosa with exposed bone without vitality. It also presents signs of infection with local pain and strong breath <sup>14</sup>.

With the progression of the disease, an irregular bone surface and probable pathological fractures may be observed during chewing <sup>15</sup>.

Radiographically, it presents with variations from radiolucent to radiopaque lesions, which are detectable only in more advanced stages, where it presents with an area of misshapen bone sequestration, surrounded by a radiolucent allus with well-defined boundaries <sup>16,17,18</sup>. As it is a pathology with infectious characteristics, professionals should be aware of possible differential diagnoses, among which alveolar osteitis, infectious osteomyelitis, periodontal diseases, and osteoradionecrosis can be highlighted<sup>18,19</sup>.

Specific alterations of the oral cavity can act as "triggers" for the development of drug osteonecrosis, such as the presence of active infectious processes such as carious lesions, periodontal diseases, or any alteration that may trigger an infectious process <sup>2,3</sup>.

Preventive measures should be taken, whenever possible, before starting treatment with antiresorptive drugs, such as thorough evaluation and adequacy of the oral cavity medium <sup>5,6</sup>.

The treatment of osteonecrosis differs as to the best therapy to be employed. Studies indicate that the combination of surgical techniques with adjuvant therapies is effective <sup>7</sup>. Surgical procedures must be well planned in advance, as they will generate new tissue trauma in regions with impaired healing <sup>8,9</sup>. Whenever possible, less invasive surgical procedures such as debridement and bone curettage associated with a broad-spectrum antimicrobial should be prioritized <sup>6</sup>.

Alternative methods such as photodynamic therapy, hyperbaric chamber and the use of Platelet and Leukocytes-Rich Fibrin (L-PRF) have been shown to be effective in the treatment of early stages of the disease, as well as in association with surgical procedures <sup>16,17</sup>.element.

LPRF is a concentrate of platelets and leukocytes that has a modulating capacity in the bone repair process by releasing growth factors. It acts to control inflammatory processes, stimulating osteogenesis and helping to repair compromised bone tissue <sup>18,19</sup>.

## CLINICAL CASE DESCRIPTION

Patient R.S.B.K., 78 years old, female, sought the private clinic for evaluation after the evolution of an abscess on the left side of the face. After clinical examination, a

computed tomography scan was requested to aid the diagnosis, since only one extraction of element 28 had been performed 8 months earlier. The patient reported that local discomfort persisted in the region of the third molar until the moment of the evolution of the pathological condition. In the medical history, it was found that the patient had been affected and treated for breast cancer approximately 10 years ago. She used a chemotherapy drug, Aromasim, for 5 years. 3 years ago, she was affected by a pathological fracture of the rib due to osteoporosis, starting the use of Denosumab. On intraoral clinical examination, a strong painful sensitivity was evidenced on palpation of the maxillary rim of 28 and discretely on the buccal surface of the implant 27. After the removal of the implant crown 27, a peri-implant probe confirmed marked exposure of the turns and a smaller number of the implant 26; and, communication with the alveolus of element 28 (Figures 1a. and 1b). On CT scans, the presence of the lamina dura and bone rarefaction on the alveolar border were observed (Figures 2 a and 2b). With the diagnosis of drug osteonecrosis due to denosumab confirmed, the surgical planning was organized with a previous prescription of amoxicillin with clavulanate and non-steroidal anti-inflammatory drugs. The implants were removed and the entire bone region involved was debrided (Figure 3). The suture was performed after the installation of L-PRF (Figure 4). After 2 weeks, the surgical wound evolved with suture dehiscence, exposing the yellowish face of the necrotic bone. There was no spontaneous discomfort. Only during palpation in the palatine and vestibular region (Figure 5).

Figure 1. Peri-implant and alveolar catheterization.



Figure 2. Panoramic image and tomographic sections.

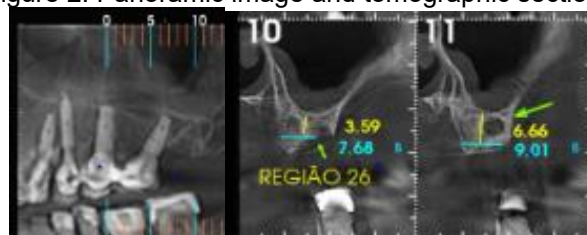


Figure 3. Explanting with decortication



Figure 4 LPRF Installation



Due to the worsening of the patient's systemic condition with the appearance of liver metastasis, a surgical reapproach was postponed upon evaluation and release by the medical team. Palliative care through irrigation with 0.9% SF, mouthwash with 0.12% chlorhexidine gluconate and 10 sessions of laser therapy relieved symptoms. Thus, after 60 days, there was an increase in bone fenestration, evidencing the implant cavity 25 (Figure 6).

Figure 5. View of the maxillary ridge. Note bone exposure and hyperemia of the oral mucosa.



After palliative care was maintained, the evolution of fenestration remained stable despite the degenerative aspect of the exposed bone after 120 days.

Figure 6. Necrotic bone and implant cavity.



Recurrent and persistent use of mouthwashes such as 0.12% chlorhexidine gluconate required a change due to a complaint of decreased taste. Therefore, the use of a mouthwash of Dutch origin called Blue M with a high concentration of active oxygen, Xylitol and lactoferric, whose joint action prevents bacterial growth, was instituted. Once the taste complaint was reestablished and without medical clearance for surgical intervention, the fenestration evolved, exposing a little more bone in the maxillary rim with the appearance of a worn necrotic 150 days after the operation. (Figure 7 ).

After 180 days of the initial intervention, a soft tissue repair without bone adhesion was observed during periodontal probing, allowing the observation of a granulation tissue isolating the bone segment, transforming it into a sequestration. It is worth noting that since the half-life of denosumab is 6 months, it is possible to suggest that its active ingredient declined, due to the increase in the osteoclastic activity of monocytes. Thus, it was possible to highlight bone sequestration without major sequelae and without the involvement of the maxillary sinus (Figures 8a and 8b)

Figure 5. Appearance of bone degeneration



Figure 6. Bone exposure with decreased hyperemia



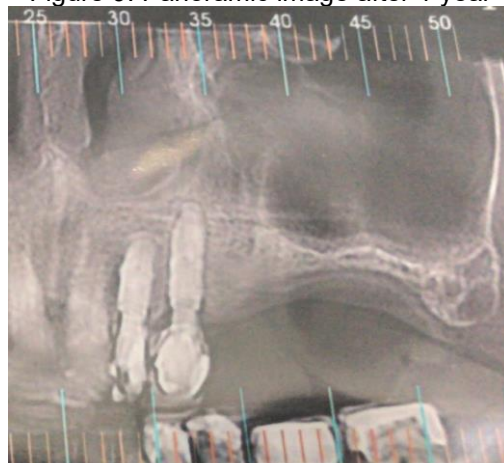
Figure 8a. Kidnapping removed.



Figure 8b after 10 days.



Figure 9. Panoramic image after 1 year



One year after the first surgical intervention, the operated region is in an excellent state of healing (Figure 9), with bone support on the floor of the maxillary sinus (Figure 10).

Figure 10. Wound healed after 1 year.



## FINAL CONSIDERATIONS

Long- and short-term oral anti-resorptive drugs are currently a preventive alternative against osteoporosis, and are widely disseminated in the medical field. However, the lack of guidance regarding the adequacy of oral health is increasing the incidence of osteonecrotic lesions of odontogenic origin, and especially of traumatic dental interventions. The dental surgeon needs to perform an accurate clinical examination in order to detect patients using antiresorptive drugs, perform the appropriate technique or refer them to the most experienced professional.





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