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## CASE REPORT

### PAGET'S DISEASE OF BONE: CASE REPORT

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#### ABSTRACT

Paget's Disease of Bone (PDB), also described as Deforming Osteitis, is defined as a process of skeletal remodeling, of monostotic or polyostotic character, in which the affected bone itself undergoes an excessive resorption process, being replaced by a weakened tissue; that leads to a propensity for fractures and deformities. Its etiology is unknown, but environmental or hereditary factors, viral infections, and inflammatory processes have been related to the clinical expression of PDB. It is not a very rare disease, being the second in prevalence in relation to bone alterations, preceded only by osteoporosis. However, some aspects must be constantly remembered, especially what concerns PDB patients oral health. This is justified by the ossicleinvolvement of the maxillo-mandibular complex and care for invasive clinical management, since the elective treatment for PDB involves the use of bisphosphonates, which in the current literature has been shown to be a potential causative agent of osteonecrosis. In this sense, the present article aims to present a clinical case report of a patient with PDB who was submitted to lower molar extraction, and to discuss the drug interactions, besides highlighting the main aspects of this disease, both in the systemic context and at the oral level.

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#### INTRODUCTION

Paget's Disease of Bones (PDB) can be defined as a change in skeletal level, with a monostotic or polyostotic character. It is related to a process of bone remodeling caused by an exacerbated activation of the osteoclastic resorption process, which results in the replacement of the bone tissue by another aspect that predisposes the patient to fractures and bone deformities (Griz *et al.*, 2006). Its etiology is unknown, but environmental or hereditary factors, viral infections, and inflammatory processes have been related to the clinical expression of PDB (Spina *et al.*, 2000; Cundy *et al.*, 2008). Initially, there is an activation of the osteoclasts at the bone site, causing the reabsorption process, which results in the recruitment of odontoblasts that seek to repair the affected area through the accelerated production of bone (Lalam *et al.*, 2016). That results in a disorganized, non-lamellar structure with osteo-fibrous component. The osteoblastic activation correlates directly with the increase of Phosphatase-Alkaline; therefore, the measurement of this enzyme in serum levels is

considered to be an important marker in the diagnostic process (Brazil, 2012). Regarding epidemiology, there is a predilection for individuals of the male gender, being more incident from the fifth decade of life. Individuals with European descent are more predisposed to the disease, and the occurrence is rare in Afro-descendants and in Asians. This reinforces the environmental component of PDB etiology (Ralston, 2013). It is the second most prevalent bone disease, being preceded only by osteoporosis (Silveira *et al.*, 2017). PDB, in its clinical course, presents three phases: the lytic phase, in which there is a predominance of osteoclasts; the mixed phase, in which there is the recruitment of osteoblasts; and the blast phase, when there is a predominance of osteoblasts. In the last phase, the processes of thickening and increase of bone density occur, formed by a bone disorganized from the functional and anatomical point of view, which predisposes to chronic pain, bone deformity, and fractures (Healy, 2015). PDB clinical expression includes: joint pain, low back pain, difficulty in movement of the affected region, and significant bone remodeling that interferes both in the musculoskeletal system and in the aesthetic aspects of the patient (Siris, 1998; Griz *et al.*, 2008). The treatment for PDB has a multi professional

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character, as it involves the specialties of geriatrics, rheumatology, orthopedics, endocrinology, neurology, and imaging, as well as auxiliary actions in the areas of psychology, physiotherapy, and dentistry. Among the drugs used for PDB maintenance are anti-inflammatory and analgesic drugs, which are used to control pain, and specific drugs, that act directly on the bone structure. The drugs of choice are those of the bisphosphonate class (Corral-Godino *et al.*, 2017), which act on osteoblasts and osteoclasts action, and collaborate in the control of bone dysfunction. Bisphosphonates are pyrophosphate analogues. Their affinity for bone hydroxyapatite and their beneficial action against bone diseases (Sampaio *et al.*, 2010), such as osteoporosis, osteolytic diseases, and PDB are known. Also, they are used in oncology for the treatment of tumors (Vasconcellos *et al.*, 2004). However, this medication has had worrying side effects, mainly related to the dental universe, due to its influence on tissue repair and the risk of developing osteonecrosis. This medication is used as first-line treatment for PDB and, in the case of a very prevalent disease, it is necessary to consider the possibility of therapeutic actions at the oral level, which often involve bone tissue exposure (e.g. surgical drainage procedures), and thereby expose the subject to potential adverse effects (José *et al.*, 2008). Bisphosphonate action on bone repair of maxilla and mandible that have been exposed to surgical procedures is still unknown. However, it is known that there are a number of metabolic processes that cause the involved tissues to react in an unconventional manner and lead to poor repair, thus exposing the individual who uses bisphosphonate to osteonecrosis, especially in mandibular bone (Gegler *et al.*, 2006). The clinical expression of osteonecrosis can be defined as bone tissue exposure (Khosla *et al.*, 2007) due to non-repair of the tissues adjacent to the operated site, which can cause functional and aesthetic damage, besides predisposing the individual to secondary infections. The treatment of osteonecrosis is obscure and involves drugs of local/topical action, up to systemic action medications and auxiliary therapies (Freiberger, *et al.*, 2009). Therefore, it is understood that, faced with a patient with bone changes, as in the case of PDB, there is a need for a complete evaluation; and specifically in the dental area, to stick to the use of medications of the bisphosphonate class, since procedures involving bone tissue exposure may develop a pattern of osteonecrosis (Almazroo; Woo, 2011). Thus, this article aims to present a case report of a PDB patient who was submitted to the extraction of residual foci of lower third molars, and to discuss the preventive measures against the potential risk of developing osteonecrosis due to the use of bisphosphonate.

## CASE REPORT

Patient L.F., male, 66 years old, brown skin, was referred for evaluation of residual foci in mandible, evidencing roots of teeth 48 and 38, without the presence of dental crown, without symptomatology, and without previous history of acute infections in the place. In the subjective examination the patient reported having PDB, a situation that was followed in rheumatology clinic, with periodic radiographic control and without use of medications for metabolic control of the disease. On physical examination, remodeling was observed in the bones of the hands, of the skull, and in the mandible. Specifically in the maxillo-mandibular complex, the patient presented an increase in the gingival roller because of

increased bone structures and significant remodeling in the palate region. In the radiographic examination, areas with the appearance of cotton flakes were observed, which is one of the classic characteristics of the pathophysiological process of PDB and denounces the disorganization of the bone tissue, making it vulnerable to fractures and post-trauma repair processes. In view of the clinical picture, conventional alveolar extraction was suggested because the patient was not on bisphosphonate; however, preserving the adjacent areas to the maximum and without exerting excessive force during the operative event, due to the risk of mandibular fracture. The procedure was conducted according to the initial planning, without complications, and the healing process was verified 10 days after the surgical procedure, with the consequent discharge of the patient. As preventive post-surgical maintenance, antibiotic (Amoxicillin 500mg 8/8h, 7 days) and anti-inflammatory (Diclofenac Sodium 50mg 8/8h, 3 days) were prescribed in order to reduce the risk of infectious processes and exacerbation of the inflammatory and painful process.



**Fig. 1. Patient's hands: note the remodeling of the bone contours**



**Fig. 2. Facial appearance (frontal): fairly pronounced facial lines**



**Fig. 3. Side view: observe the increase of the glabellar region, zygomatic and the aponeurotic region**



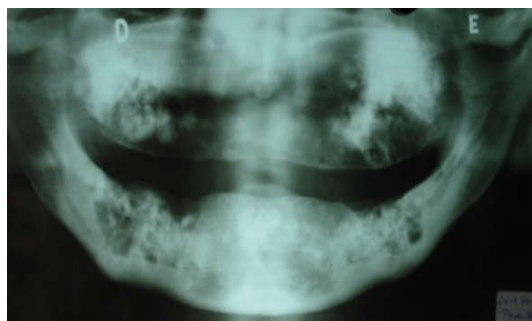
**Fig. 4. Aspect of upper arch**



**Fig. 5. Aspect of the lower arch. Note the presence of residual roots in the tooth region 38 and 48**



**Fig. 6. Radiography of the sinuses. Note the predominant radiopaque aspect, due to the blast process**



**Fig. 7. Panoramic X-ray: note the appearance of cotton flakes in the bones of the jaw and jaw as a factor in the progression of the disease**



**Fig. 8. Telerradiography: radiopaque image at the base of the skull**

## DISCUSSION

In the present case, it is observed that PDB causes physical and anatomical changes that can lead to deviations of psychic order, such as depression, closure, and non-acceptance of the pathological process. In addition, studies have shown that PDB patients have a negative impact on quality of life (Castro *et al.*, 2017). The treatment itself is based on limitation of the damage, which motivates the use of methods for early diagnosis. Another important point is the rehabilitation of the PDB patient's masticatory functions. Due to the bony enlargement of the "pliable" area, both in the upper and lower arch, it becomes difficult to adapt prostheses. The use of implants in these cases is contraindicated due to bone fragility. In view of this, the oral health team should seek to perform rehabilitation processes guided by a periodic follow-up, in order not to aggravate the bone, which may suffer prosthesis action and aggravate the PDB. Invasive dental treatment of individuals with bone diseases, as in the case report described, deserves attention, especially of those who use bisphosphonate. The world literature, as well as the manufacturers of bisphosphonate class medications, have alerted the dental and medical category on the potential risk of osteonecrosis development; nevertheless, it is a subject that was effectively put in discussion since 2003, when the first cases appeared (Marx *et al.*, 2003; Carvalho, 2008). Considering the large number of individuals who are affected by bone diseases and who are indicated for the use of bisphosphonate, there is a real need for protocols for dental interventions that may expose the individual to the risk of osteonecrosis. The preventive process should be initiated by the medical category, which performs the first reception of the PDB patient. If the use of bisphosphonate is indicated, it should guide the individual's referral for dental evaluation, in order to provide clinical and/or preventative treatment before medication begins, in order to limit invasive treatments at the oral level and, thus, collaborate in the preventive management of osteonecrosis of the maxillo-mandibular complex.

## Final considerations

In view of the above, it can be deduced that technical knowledge in PDB is important for the dental team, since the condition can involve the bones of the maxillo-mandibular complex and hinder the aesthetic-functional rehabilitation processes. In addition, PDB treatment often involves the use of bisphosphonate, a drug that the literature has presented as an osteonecrosis promoting agent when exposed to bone tissue, a

process that may occur in certain clinical dental procedures, such as the exodontia. Therefore, the surgeon-dentist, in the face of osteonecrosis, should be attentive to the patient's report on their general health and medication use. In this way, the surgeon can establish the best behavior, taking into account the need and the opportunity for intervention for stomatognathic system function restoration, since there are no effective protocols for the prevention of bone disorders caused by bisphosphonate use.

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