

## Atypical traumatic bone cyst involving impacted lower third molar: report of case

### Cisto ósseo traumático atípico envolvendo terceiro molar inferior impactado: relato de caso

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#### ABSTRACT

The traumatic bone cyst is an uncommon nonneoplastic lesion of the jaws that is considered as a "pseudocyst" because of the lack of an epithelial lining. This lesion is particularly asymptomatic and, therefore, is diagnosed by routine dental radiographic examination as a unilocular radiolucency with scalloped borders, mainly in the posterior mandibular region. The exact etiopathogenesis of the lesion remains uncertain, though it is often associated with trauma. The objective of this paper is to report one case of atypical traumatic bone cyst involving impacted lower third molar, addressing its clinical and radiographic characteristics, differential diagnosis, treatment through surgical exploration and case follow-up.

**Indexing terms:** Bone cysts. Differential diagnosis. Oral surgical procedures. Tooth, impacted.

#### RESUMO

O cisto ósseo traumático é uma lesão não neoplásica incomum dos maxilares, considerada um "pseudocisto" devido à ausência de um revestimento epitelial. Esta lesão é particularmente assintomática e, portanto, é diagnosticada pelo exame radiográfico odontológico de rotina como uma radiolucência unilocular com bordas recortadas, principalmente na região mandibular posterior. A etiopatogenia exata da lesão permanece incerta, embora esteja frequentemente associada a trauma. O objetivo deste trabalho é relatar um caso de cisto ósseo traumático atípico envolvendo terceiro molar inferior impactado abordando suas características clínicas, radiográficas, diagnóstico diferencial, tratamento por meio de exploração cirúrgica e preservação do caso.

**Termos de indexação:** Cistos ósseos. Diagnóstico diferencial. Procedimentos cirúrgicos bucais. Dente impactado.

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How to cite this article

Vale DS, Lopes HB, Freitas GP, Araujo NP, Rosa FG, Nunes Júnior F. Atypical traumatic bone cyst involving impacted lower third molar: report of case. RGO, Rev Gaúch Odontol. 2023;71:e20230011. <http://dx.doi.org/10.1590/1981-86372023001120210149>

## INTRODUCTION

According to the World Health Organization, the Traumatic Bone Cyst (TBC) is an intraosseous pseudocyst devoid of epithelium, equally empty or filled with serous or bloody fluid [1]. It was initially described in Dentistry by Carl D. Lucas in 1929 [2], and has synonyms such as solitary bone cyst, simple bone cyst, hemorrhagic bone cyst and idiopathic bone cavity [1-3].

Considered a non-neoplastic bone lesion, it comprises only 1-2% of maxillary cysts [4]. The etiology of TBC is not yet defined; nevertheless, the literature supports the suggested thesis of liquefied necrosis or blood clot reabsorption after hemorrhage in the medullary bone resulting from some trauma, resulting in destruction of the surrounding bone, causing an increase in the bone cavity [5].

Traumatic bone cysts have no genre predilection [6] and are usually diagnosed in young patients, in the first two decades of life, although it can be diagnosed in any age group. The vast majority are asymptomatic and discovered in routine radiographic examinations such as panoramic radiographs. On clinical examination, it usually does not bring cortical bulging [7], having a positive response to pulp vitality tests [4].

Radiographically presents itself as a radiolucent image with irregular or well-defined jagged edges, unilocular. Also, its multilocular presentation being uncommon and due to its medullary confinement, it rarely expands the bone plate [3]. Also, root resorption is rare [4].

Microscopic examination shows clotted blood, fibrin, and occasionally giant cells [1]. Surgical exploration is the most recommended curative therapy, as well as the best way to close the diagnosis of traumatic bone cyst. Therefore, thus ruling out other cystic lesions with more aggressive behavior in its differential diagnosis [8].

The target of this paper is to report one case of atypical traumatic bone cyst involving impacted lower third molar, addressing its clinical and radiographic characteristics, differential diagnosis, treatment through surgical exploration and case follow-up.

## CASE REPORT

A 15-year-old male was forwarded to the Department of Dentistry, São Lucas University Center (UNISL) in Porto Velho, Rondonia, by his orthodontist. In his orthodontic records, a panoramic radiography image showed a radiolucent multilocular large lesion with undefined margins involving the impacted lower third molar on the right side (tooth 48) extending to the mandibular ramus (figure 1). During the anamnesis, no systemic disorders were found, but the patient reported an episode of trauma in the region playing soccer. In the intraoral examination, absence of swelling and without symptoms was observed.



**Figure 1.** Initial panoramic radiograph showing an multilocular radiolucent large lesion with undefined margins involving the tooth 48 impacted.

Cone beam computed tomography (CBCT) was requested for a better imaging evaluation of the lesion (figure 2A and 2B), showing the resorption of the buccal bone cortical of the mandibular ramus. Considering the radiographic characteristics of the lesion, as well as involvement with an impacted lower third molar, the diagnostic hypotheses were ameloblastoma or odontogenic keratocyst.



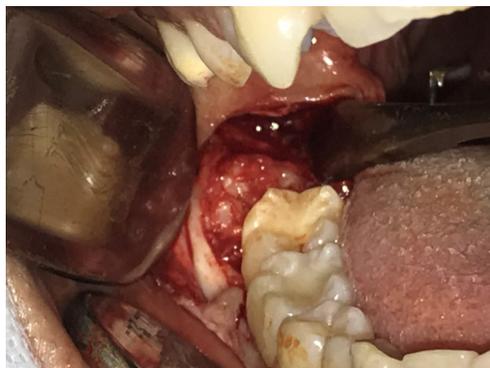
**Figure 2.** CBCT showing lesion involving the tooth 48 impacted. A) Axial view. B) 3D reconstruction view.

Thereby, surgical exploration was performed with the purpose of an incisional biopsy for subsequent histopathological report with a conclusive diagnosis of the lesion.

Under local anesthesia was made an intrasutural incision through teeth 46 and 47 with extension to the region of the anterior edge of the ramus of mandible. It was displaced, giving access the area of the tooth 48 impacted. Before reaching the lesion, a small bone cavity was made with a surgical drill, under saline irrigation, posterior to tooth 48 impacted, to puncture the lesion and determine its internal contents, thereby discarding vascular lesions, such as hemangioma and aneurysmal cyst, as the origin.

The puncture was positive for cystic fluid and, thus, an osteotomy was performed to remove the tooth 48 impacted, expanding the access to the lesion (figure 3). Since the lesion had no capsule, and surgically it was only an empty cavity, the surgical diagnosis was conclusive for traumatic bone cyst. The interior of the surgical cavity was curetted in all its walls to induce bleeding and enable bone formation.

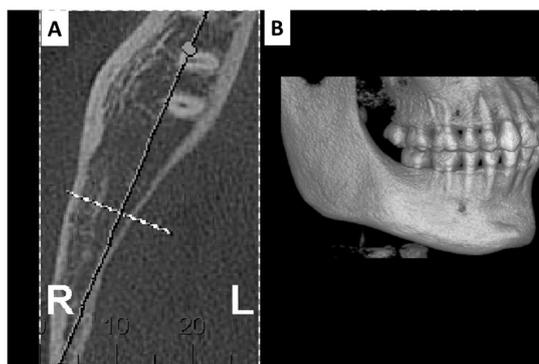
Twelve months after the surgery, the panoramic radiography (figure 4) and CBCT (figure 5A e 5B) for postoperative control showed new bone formation at the site in response to the induced bleeding during the surgery. Thus, the radiographic images show a successful treatment with bone formation in the right posterior part of the mandible.



**Figure 3.** Surgical appearance of the empty cavity after removed the tooth 48 impacted.



**Figure 4.** Panoramic radiograph one year postoperatively, showing bone formation in the right posterior part of the mandible.



**Figure 5.** CBCT one year postoperatively showing bone formation in the right posterior part of the mandible. A) Axial view. B) 3D reconstruction view.

## DISCUSSION

TBC has been referred to by different names in the literature. When occurring in the jaw - traumatic, hemorrhagic, or extravasation bone cysts are the preferred diagnostic terms. However, extragnathic lesions are usually termed simple, solitary, or unicameral cysts [3,9,10]. The wide variety of names is indicative of the etiology of the lesion as a matter of conjecture. Regardless of the traumatic-hemorrhagic hypothesis is widely accepted beyond the divergent views regarding the etiology of TBC, it does not agree with development of the lesion without a clear history of trauma to the orofacial region in many cases [3,6]. In our study, the patient reports a history of trauma in the region of the lesion playing soccer.

The TBC is a nonneoplastic intraosseous lesion that mostly affects patients in their second decade of life; the approximate mean age of patients is 20 years. Sex predilection is controversial; although some studies have not found any sex predominance [3], some have stated a male predilection [11,12]. The majority of TBCs taking place in the maxillofacial region are preferentially located in the body and symphysis of the mandible; however, a few cases in the condyle and of the multiple TBCs have been reported [13]. In our study, the reported case involved a male patient in the second decade of life (15-year-old), and the lesion was localized in the posterior region of the mandible associated with the impacted third molar. Therefore, due to this location feature involving a retained third molar, this makes it an atypical case of TBC.

Most patients are asymptomatic, and the lesion is generally discovered incidentally through routine radiographic examination. Regarding clinical findings, the lesion usually presents itself without symptoms, and a few patients demonstrate an increased volume of the affected area. The teeth involved are vital and show no evidence of root

resorption [4,11,12]. In the case presented here, the patient had no edema, no painful symptoms, and the lesion was detected on a panoramic radiograph requested for planning orthodontic therapy.

Radiographically, the cyst appears as a radiolucent area, usually unilocular, variable in size and with well-defined limits [14]. In the case report, the TBC appears as an multilocular large radiolucent lesion with undefined margins involving the impacted lower third molar on the right side (tooth 48), showing the resorption of the buccal bone cortical of the mandibular ramus.

Concerning treatment, some studies have reported that this lesion may be self-repairing, this would even justify the low incidence of TBC in older patients [15,16]. However, surgical exploration is the most recommended curative therapy, as well as the best way to close the diagnosis of traumatic bone cyst. After that procedure, the new bone formation is considerably fast [4]. Also, bone regeneration with plasma-rich-protein following enucleation of traumatic bone cyst has been reported to speed up bone cavity repair [17]. In the present case, due to the location of the lesion and association with retained lower third molar, surgical exploration was the chosen treatment method, as it was essential for the differential diagnosis with other more aggressive lesions such as ameloblastoma and odontogenic keratocyst. Therefore, having ruled out the possibility of these more aggressive lesions, curettage of the walls of the surgical cavity was performed to stimulate bone neof ormation. There was no need to collect tissue for histopathological analysis due to the absence of an epithelial membrane.

## CONCLUSION

TBC is an asymptomatic lesion, mostly discovered during routine radiographic examination. Also, TBC associated impacted lower third molar is atypical case and little reported in the literature. Besides, surgical exploration was the most appropriate treatment method for the reported clinical case, as it allowed us to rule out other pathologies with radiographic characteristics like TBC, but with a more aggressive behavior. In addition, it allowed for faster bone cavity repair.

## Collaborators

DS Vale, surgeon responsible for conducting the case, preparation of paper and review of the text. HB Lopes and GP Freitas, preparation of paper and review of the text. NP Araujo, FG Rosa and FN Junior, review of the text.

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Received on: 21/12/2021

Final version resubmitted on: 16/8/2022

Approved on: 7/10/2022

Assistant editor: Fabiana Mantovani Gomes França