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Case Report

### Conservative approach in a large maxillary inflammatory cyst

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#### Abstract

**Background:** Radicular cyst is the most prevalent inflammatory odontogenic cyst and it has small dimensions. The objective of this work is to report a case, approaching conservative therapeutic intervention, using marsupialization and cystic enucleation associated with endodontic therapy, for the treatment of a large radicular cyst in the maxilla. **Case report:** A young female patient with pain and swelling in region of the sulcus and palate in the left side from maxilla and movimentation of teeth 22 and 23. Panoramic radiography showed unilocular radiolucent image, extending from 21 to 25, approximately 4cm at its largest diameter. The histopathological result of the biopsys revealed an odontogenic cyst of inflammatory origin. The therapeutic approach was the endodontic treatment of 21 and 23 and endodontic therapy of the involved teeth associated with marsupialization, which allowed a reduction of the lesion and the possibility of cystic enucleation, avoided the possible involvement of adjacent structures, such as the maxillary sinus, with regression of signs and symptoms, achieving the restoration of patients'oral homeostasis.

Keywords: Endodontics, Apicectomy, Odontogenic Cysts, Radicular cyst, Descompression Surgical

## INTRODUCTION

Radicular cysts are the most prevalent odontogenic inflammatory lesion in the oral cavity, accounting for the majority of all odontogenic cysts, <sup>[1-5]</sup> being more prevalent in adults, between the third and sixth decades, being more frequently located in the anterior region of the maxilla. <sup>[6]</sup> It originates from a devitalized tooth, with necrotic pulp, coming from a periapical granuloma, which is derived from a prolonged endodontic infection, which stimulates the proliferation of the epithelial remains of Malassez near the infected region, thus forming a cystic cavity, which develops due to the accumulation of fluid in its interior. <sup>[7]</sup>

Most radicular cysts have a slow evolution and can reach large extensions. Its diagnosis is usually given by routine intraoral radiographs, or in cases of re-acutization, in which the patient may present spontaneous pain, purulent exudation and rapid increase in the volume of the cystic cavity. <sup>[7,8]</sup> Radiographically, it appears as a radiolucent, unilocular, circular/oval area, with continuous, well-defined and regular limits and adjacent to the root of a devitalized tooth. <sup>[9]</sup> In most cases, it can present with sizes ranging from five millimeters to a few centimeters in diameter, but most have an average diameter of 1.5 cm. <sup>[10]</sup> When they present a large extension, swelling, sensitivity, painful symptoms, mobility and tooth displacement can be observed. <sup>[11]</sup>

Establishing the type of treatment depends on the size and location of the lesion, adjacent bone integrity and its proximity to vital structures. <sup>[8,12-14]</sup> In smaller lesions, the treatment of choice is non-surgical endodontic therapy. In extensive lesions, treatment consists of marsupialization, followed by cystic enucleation and endodontic treatment of the involved teeth. <sup>[9,13-15]</sup> Regardless of the diameter or therapeutic approach, after treatment, clinical and radiographic follow-up is necessary to assess tissue repair, observe the bone neoformation process and the absence of symptoms. <sup>[13]</sup> Generally, inflammatory cysts do not recur after adequate treatment, and occasionally fibrous scars may occur, instead of bone neoformation, however, without necessity for intervention, <sup>[16]</sup> with long-term follow-up.

The present work aims to report a case of a large radicular cyst, using the technique of marsupialization, followed by enucleation, associated with endodontic treatment of involved teeth.

#### **Case Report**

A 26-year-old female patient presented with a complaint of pain and edema in the left maxilla region. On physical examination, there was swelling in the region of 23, and a slight swelling in left palate, close to teeth 22 and 23, causing malposition (Figure 1).



**Figure 1:** Swelling in the anterior palate on the left side and buccal region of teeth 22 and 23 (arrows).

Teeth 21, 22 and 23 responded negatively to the pulp vitality tests. Panoramic radiograph revealed a large unilocular radiolucent image, with irregular contours, with a radiopaque halo, measuring approximately 4cm in its largest diameter, in the left maxillary sinus, close to periapical region of teeth 21 to 25 (arrows), causing roots divergence of 22 and 23, and 22 being endodontically treated (Figure 2).

Cone Beam Computed Tomography showed an extensive hypodense, oval, homogeneous, unilocular, well-delimited image, with a discrete hyperdense halo, located in the anterior region of the maxilla, on the left side, involving the periapical region of teeth 21 to 25. The lesion was in intimate close contact with nasopalatine canal, floor of the left nasal cavity (with bulging and thinning of its floor) and with medial wall of left maxillary sinus. The lesion also causes accentuated bulging/thinning and possible rupture of the buccal and palatal bone corticals (Figure 3).



Figure 2: Initial radiographic aspect showing large radiolucent image (arrows) involving the apical region of teeth 21 to 25.



**Figure 3:** Tomographic aspect showing hypodense, well-delimited, unilocular images of great extension in: (A) sagittal, (B) axial and (C) coronal views.

The diagnostic hypotheses were radicular cyst and unicystic ameloblastoma. Incisional biopsy was performed and histopathological report was consistent with an inflammatory odontogenic cyst.

Endodontic treatment of teeth 21 and 23 was started and tooth 22 was cleared using the Pro-Design R (Easy) system, with constant exudate secretion from this tooth. All conducts were cleaned and disinfected with 2.5% sodium hypochlorite (NaClO), placement of intracanal medication (formocresol-Biodynamics) and temporary sealing with ionomeric cement (SSWhite).

Then, the lesion was marsupialized, with a circular incision in the region between 22 and 23, and suture of a rubber drain (Figure 4). The patient was instructed to perform daily cleaning of the cystic cavity, using sterile gauze with 0.12% chlorhexidine gluconate (Periogard, Colgate) to prevent secondary infection, in addition to mouthwashes with its. The rubber drain was maintained for 21 days, with exudation being present throughout this period. Even after drain removal, there was still persistence of exudation. After three months of follow-up, the absence of exudate drainage and also a reduction in the lesion were reported.



Figure 4: Marsupialization with drain suture.

Thus, free of exudate, endodontic treatment was finalized. Electronic odontometry was performed with the Romiapex a15 (Rompidan) tooth locator and manual refinement, using K-type files, using 2.5% sodium hypochlorite (NaClO) as irrigator, between file changes. Then, the conducts were filled using a calibrated Odous cone (Odous de Deus) and Sealer 26 (Dentisply) obturator cement.

During 22 endodontic retreatment, loss of path of the conduct at the apex was observed, causing failure of the apical seal. Therefore, eight days after the endodontic filling, a parendodontic surgery was performed, after enucleation of the lesion, with histopathological confirmation of an inflammatory odontogenic cyst.

After curettage of the cystic cavity, 22 apicectomy was performed, using an extra fine diamond bur (FG Microdont), following the bevel orientation, and application of 2% chlorhexidine gel (Maquira) for five minutes. Afterwards, retroobturation was performed, using p1 ultrasonic insert (Helsen) and apical sealing with PBS HP<sup>®</sup> biological cement (CIMMO). Amoxicillin/500mg (8/8 hours, seven days), dexamethasone/4mg (12/12 hours, five days) and dipyrone/1g (12/12 hours, three days) were prescribed.

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Three months after cystic decompression and eight days after parendodontic surgery and cystic enucleation, the patient returns for suture removal. Panoramic radiography showed regression of part of the lesion and bone neoformation and after one month of enucleation and endodontic surgery, the patient returns without painful symptoms, absence of intraoral swelling and tooth repositioning (Figure 5). The periapical radiograph (Figure 6) showed bone neoformation and the patient continues to be followed up.



**Figure-5:** Absence of swelling and repositioning of 22 and 23 (four mouths after the beginning of treatment).



**Figure-6:** Periapical radiograph showing bone neoformation.

The patient signed an Informed Consent Form and this case was conducted in compliance with all bioethical principles.

# DISCUSSION

The present case reported a large-volume inflammatory cyst resulting from an unsuccessful endodontic treatment. Radicular cysts are lesions resulting from: pulp mortification chronic infections, unsuccessful endodontic treatments, as well as persistent inflammatory stimulus with the induction and proliferation of epithelial debris of Malassez, in the periapical region. <sup>[7]</sup> Among odontogenic cysts, radicular cysts are the most prevalent. <sup>[4,5]</sup>. A retrospective study of histopathological analyzes in a Brazilian service found a higher prevalence of inflammatory odontogenic cysts in the maxilla (54.8%), adults (41.0  $\pm$  15.34 years). Among the inflammatory odontogenic cysts, the radicular cyst (46.1%) was the most prevalent. <sup>[4]</sup>

The patient in this case presented swelling and painful symptoms, due to the exacerbation of the inflammatory process and also a persistent exudate drainage from teeth 22- the probable cause of that large cyst. However, in most cases inflammatory radicular cysts are small and without symptoms, but with an acute exacerbation, there may be swelling, discomfort and pain in the affected region, associated with the negative response to pulp vitality tests of the teeth involved. <sup>[17]</sup>. Such conditions were observed in the present case, with two more teeth (21, 23) had a negative response to pulp vitality tests. <sup>[8]</sup> Due to the expansion of the lesion, there was a slight malposition/crowding of 22 and 23 due to the distalization of their roots.

Imaging exams such as panoramic radiography and computed tomography is important to diagnosis and surgical planning. However, there are many radiolucent lesions with similar radiographic aspects, such as periapical granuloma, odontogenic keratocyst and unicystic ameloblastoma and a large extension radicular cyst should also be considered in the differential diagnosis. <sup>[18-20]</sup> Panoramic radiograph showed a large unilocular radiolucent image extending from 21 to 25, and the presence of unsatisfactory endodontic treatment of 22. Cone beam computed tomography with three-dimensional images and minimal distortion, allowed the visualization of the affected region in depth and the association of the lesion with adjacent anatomical structures. <sup>[8,9,21]</sup>. Tomography of the case showed a hypodense, well-delimited, unilocular image, with a hyperdense halo, in the region of the left maxillary sinus, and the involvement of the lesion with important anatomical structures, such as nasal cavity, maxillary sinus can lead to serious complications as a septic thrombosis of the cavernous sinus, putting the patient's life at risk, which, although rare, can occur with risk of death. <sup>[22]</sup> However, in the present case, there was no disruption of the floor of the maxillary sinus, despite its thinning caused by the compression of the lesion, verified by tomography. In addition, the intracystic decompression resulting from marsupialization facilitated enucleation and avoided possible contamination of the maxillary sinus.

Due to very similar radiographic characteristics between radiolucent lesions, biopsy is essential for the diagnosis of the lesion. <sup>[18,19,23,24]</sup> The biopsy of the present case confirmed the diagnostic hypothesis of an inflammatory odontogenic cyst, on the two occasions it was performed. The histopathological results showed cystic cavity, covered by hyperplastic parakeratinized stratified squamous epithelium, chronic inflammatory exudate with the presence of lymphocytes, neutrophils and plasma cells, multinucleated giant cells, cholesterol crystals, red blood cells and densely collagenized fibrous capsule. <sup>[7,8,18,24]</sup>

The therapeutic approach in this case was the maintenance of the involved necrotic teeth, with endodontic treatments on 21 and 23 and endodontic retreatment of 22, as well as marsupialization and placement of a drain for intracystic decompression and drainage of the exudate, for subsequent enucleation. This treatment is suitable for teeth that are able to be preserved, <sup>[17]</sup> from previous endodontic treatment and subsequent surgical removal of the periapical lesion. <sup>[8]</sup> Marsupialization was essential to reduce intracystic pressure and lesion volume, facilitating drainage, cleaning and reducing the size of the lesion, <sup>[23]</sup> preparing for subsequent apicectomy of the 22 and enucleation of the cystic lesion. <sup>[8]</sup> However, other authors <sup>[18,23,24]</sup> chose to perform enucleation in a large lesion in the maxillary sinus region, although the latter authors reported a slight advantage of marsupialization over enucleation, in cases of involvement of the maxillary sinus and also in mixed dentition, with preservation of permanent tooth. Tanaka *et al.* <sup>[25]</sup> also opted for marsupialization of a large radicular cyst in the maxillary sinus in a child with mixed dentition and preservation of the permanent, and also Alarabi *et al.* <sup>[26]</sup>, who performed marsupialization in a mandibular cyst in a child with mixed dentition. Deshmuch *et al.* <sup>[24]</sup> performed extraction of the involved tooth (26) in na adult man with a large enucleated cyst in the maxillar.

As tooth 22 showed loss of apical trajectory during re-instrumentation during endodontic retreatment, apicectomy and retrofilling were performed, with apical sealing using biological cement. <sup>[8]</sup> Apicectomy is an alternative to minimize the possibility of new reinfection and elimination of bacterial endotoxins, in cases where it is not possible to control the exudate (which took time in the presen case), to reverse the infectious and inflammatory conditions, in addition to allowing better intraradicular biomechanics and efficient filling and regeneration of surrounded tissues. <sup>[11]</sup>

The conservative approach performed in this case was effective and successful, allowing for lesion remission and bone neoformation, as well as preservation of the teeth and their functional reestablishment, which are important for the patient's aesthetics. Furthermore, it avoid compromised of the anatomical structures involved with the injury. Such conditions were confirmed in the patient's follow-up. <sup>[15]</sup>

## CONCLUSION

The conservative approach performed, with cystic decompression and subsequent enucleation of the cyst, associated with endodontic treatment presented an effective alternative for tooth preservation, and maintenance of the patient's function and esthetics, without compromising the adjacent structures, such as the maxillary sinus, which could cause complications for the patient.

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