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CASE PRESENTATION

Diagnostic and therapeutic approach to a case of odontogenic keratocyst

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ABSTRACT

Introduction: the odontogenic keratocyst is a benign epithelial lesion with aggressive behavior and high recurrence, whose early detection is essential to preserve maxillofacial function.
Objective: to present the diagnostic and therapeutic approach of a clinical case of odontogenic keratocyst in a young patient.
Case presentation: a 23-year-old male patient from riobamba was described, with an incidental radiographic finding of a unilocular radiolucent image associated with the impacted lower left third molar. Clinical examination revealed no alterations. Extraction of the molar was performed, followed by enucleation of the lesion, curettage, and application of carnoy's solution, complemented with excisional biopsy. Histopathological analysis confirmed a parakeratinized odontogenic keratocyst, characterized by stratified squamous epithelium with prominent nuclei and satellite cysts. Clinical and radiographic follow-up at three months showed adequate bone regeneration and absence of recurrence. Management included conservative techniques combined with adjuvants to reduce the risk of relapse, prioritizing the preservation of anatomical structures.
Conclusions: this case highlights the importance of early diagnosis and personalized treatment. The combination of marsupialization, enucleation, and Carnoy's solution represents an effective alternative to decrease recurrence, ensuring functionality and aesthetics in young patients.

Keywords: Surgery, Oral; Diagnosis, Oral; Odontogenic Cysts; Bone Regeneration.

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INTRODUCTION

Odontogenic keratocysts are most frequently found in the mandibular ramus region and in relation to the lower third molars.[1,2] However, in the case described, it was evident in a young patient during the second decade of life, which underlines the need for a timely and personalized diagnostic and therapeutic approach. [3,4,5]

Although this lesion does not usually manifest in children, its aggressive behavior, destructive capacity and high recurrence in the third decade of life justify the importance of early diagnosis.[1,6,7] Since in most cases it is asymptomatic, panoramic, occlusal radiographs and tomography are essential for its detection.[8,9,10,11]

Conservative surgical treatment, accompanied by regular clinical and radiographic follow-up, is an effective strategy for reducing recurrence. This approach allows for the reduction of complications and the preservation of anatomical structures, especially in growing patients, where age should guide reconstructive decisions. The combination of techniques such as marsupialization and enucleation, along with the use of adjuvants, has proven to be a valid alternative. This management aims to maintain functionality and aesthetics, while minimizing the impact on adjacent tissues and reducing surgical morbidity.[12,13,14,15]

Finally, the application of modified Carnoy's solution has become established as an effective therapeutic option. This chemical agent helps reduce the recurrence rate and prevents damage to adjacent structures, offering a conservative alternative that guarantees satisfactory results in young patients.[6,14] Considering the above, this review was conducted, with the objective of presenting the diagnostic and therapeutic approach to a clinical case of odontogenic keratocyst in a young patient.

CASE REPORT

A 23-year-old male patient from Riobamba, Ecuador, presented to the DentalMedik dental specialty center requesting an evaluation for the extraction of his lower left third molar. During the initial evaluation, a diagnostic protocol was implemented. The patient reported no signs or symptoms, and the extraoral and intraoral clinical examination revealed no abnormalities.

The radiographic study (Fig. 1) revealed a well-circumscribed, unilocular, oval radiolucent lesion approximately 8 mm in diameter, surrounded by a radiopaque halo, located in the periapical and periradicular area of the distolingual root of tooth 3,8 (left mandibular third molar). Based on this finding, extraction of the molar and surgical intervention of the lesion were planned.

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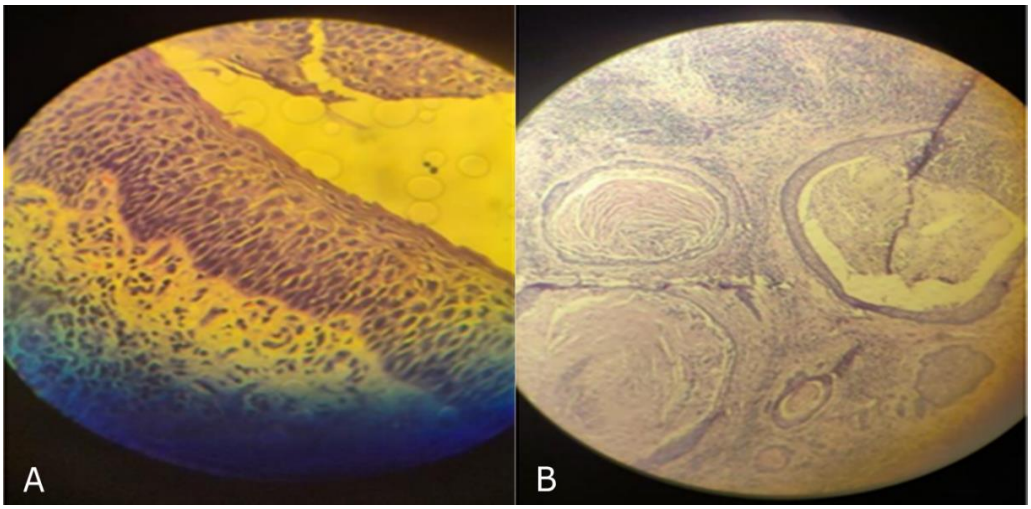
Grades: An oval or rounded cavity is observed, presenting as a well-circumscribed radiolucent image with thin radiopaque borders, periapical and periradicular zone at the level of the root (distopalatal) of tooth 3.8 (lower left third molar)

Fig. 1 Panoramic radiograph of the patient showing the keratocyst in quadrant 3.

Under local anesthesia, tooth 3,8 was extracted, followed by enucleation and complete curettage of the cavity, complemented by the application of Carnoy's solution. An excisional biopsy of the cystic lesion was also performed, and the cavity was sutured with 4/0 nylon. Histopathological analysis (Fig. 2) revealed parakeratinized squamous epithelium with pale cells with prominent polarized nuclei and the presence of satellite cysts, confirming the definitive diagnosis of odontogenic keratocyst.



Grades: A (evidence of the macroscopic appearance of the tissue sample); B (evidence of the microscopic appearance of the tissue sample))

Fig. 2 Histological section of the biopsy taken.

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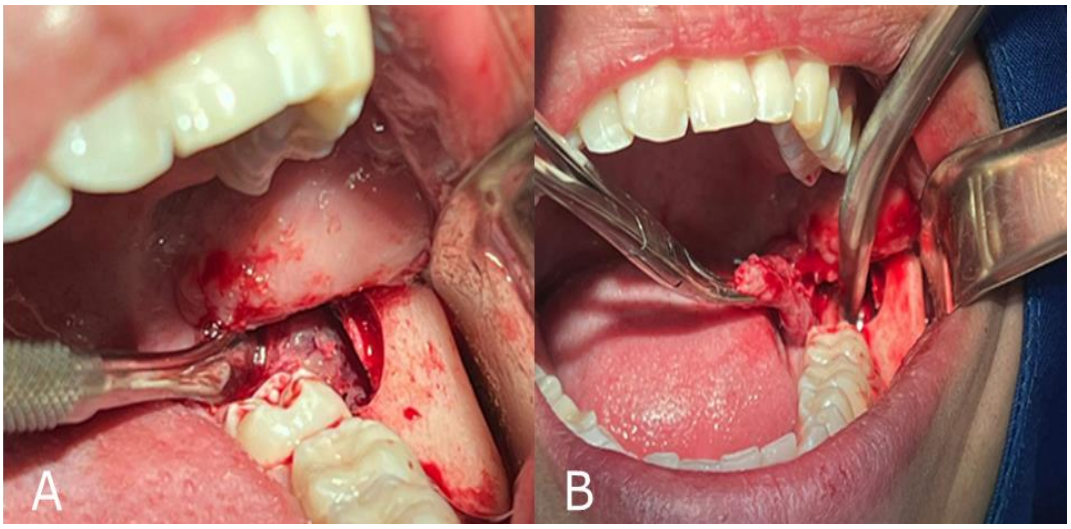
Rev Ciencias Médicas. 2025; 29(S1): e6981

A conservative treatment was chosen, consisting of marsupialization, enucleation, curettage, Carnoy's solution, and excisional biopsy. The surgical treatment was performed under strict aseptic and antiseptic conditions, using 2 % chlorhexidine for the surgical field, intraoral rinsing with 0,12 % chlorhexidine, and extraoral preparation with alcoholic chlorhexidine. The Vazirani-Akinosi anesthetic technique (closed mouth) was employed, and a linear wrap-around incision was made from the retromolar trigone to the first lower left molar, raising a mucoperiosteal flap, allowing exposure of the cyst (Fig. 3).



Grades: A (incision at the site of the lesion); B (exposure of the cyst)

Fig. 3 Surgical approach performed.

Aspiration was performed, yielding pearly yellowish fluid consistent with keratin, ruling out purulent infection. The lesion was completely removed (Fig. 4) and sent in 10 % formalin for histological examination. The wound was closed with four simple sutures, which were removed after eight days. Medication consisted solely of analgesics due to the absence of infection.

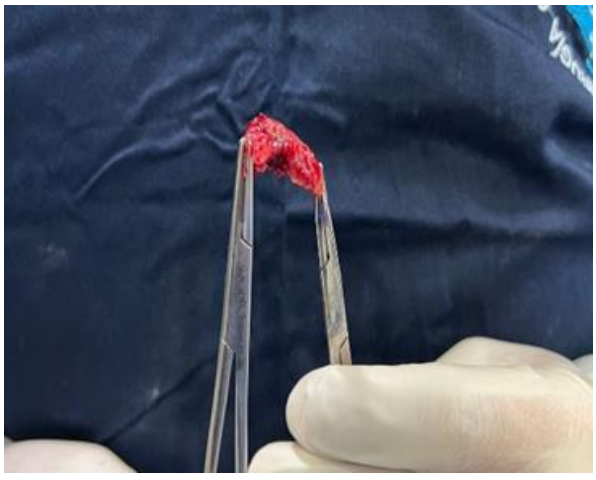


Fig. 4 Odontogenic keratocyst removed.

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Clinical and radiographic follow-up at three months (Fig. 5) showed adequate healing and bone regeneration, with no evidence of recurrence of the lesion. The conservative management implemented allowed for the preservation of anatomical structures and ensured a favorable outcome for the patient.

Fig. 5 Panoramic radiograph for follow-up.

DISCUSSION

The odontogenic keratocyst was first described in 1956, highlighting its aggressive behavior and high recurrence rate; subsequently, in 1960, its histological characteristics were detailed, and later, the keratinization in primordial cysts was described, refuting the initial assumptions.[5,16] In 2005, the World Health Organization reclassified it as a benign, uni- or multicystic, intraosseous lesion of neoplastic origin, lined with parakeratinized stratified squamous epithelium and with potentially infiltrative behavior.[17] Finally, in 2017, the WHO recategorized it as a keratocystic odontogenic tumor, lined by parakeratinized squamous epithelium of 4-12 cell layers, capable of affecting the maxilla without manifesting evident clinical signs.[18,19]

Most cases of keratocysts are asymptomatic; however, clinically, the lesion usually causes swelling, pain, and bone expansion, with slow growth.[7] As mentioned in the case report, this type of lesion is often asymptomatic and is usually found after routine radiographic examinations or for other reasons. Sometimes, despite being large, they do not present with painful symptoms. Symptoms may only begin due to a superinfection of the cyst, showing signs of local inflammation and, in some cases, exaggerated evolution, presenting with abscesses or fistulas.[20]

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According to Quintana Díaz and colleagues,[7] a multilocular radiographic appearance is the most frequent in parakeratinized odontogenic keratocysts associated with basal cell nevus carcinoma syndrome, while a unilocular radiographic appearance is more related to orthokeratotic lesions. It is essential to note that in this case report, the radiographic appearance is unilocular, and after histological studies for obtaining the biopsy, it was found to be associated with a parakeratinized keratocyst, somewhat contradicting what the author mentioned. This finding coincides with the literature review regarding its histological characteristics, which mentioned a minority of cases with orthokeratosis.

This type of lesion is of great interest due to its high recurrence rate, estimated at 20-30 %. Keratocysts are characterized by a high cellular proliferative potential, mediated by proteins related to cell apoptosis (p53, bcl-2, ki67, and PCNA), which are elevated in this type of cyst. Similarly, the production of IL-1, IL-6, TNF, and intraluminal prostaglandins demonstrates its recurrent behavior.[20] Therefore, a clinical/radiographic follow-up was performed on the patient reported in this case after three months to observe for any recurrence. It is also emphasized that follow-up should be performed periodically to prevent this harmful condition associated with odontogenic keratocysts.

The choice of treatment is a subject of debate due to the various factors involved in treating a keratocyst. The most decisive factors are the high recurrence rate of the lesion, the effectiveness of existing techniques or combinations of techniques, and the patient's condition, as well as the condition of the lesion itself. The treatment performed followed a more conservative approach, consisting of marsupialization and enucleation with Carnoy's solution, curettage of the cavity, and an excisional biopsy.

The use of marsupialization as a first-line treatment is effective, but the idea of using more aggressive methods in case of complications is not rejected,[9] but it can be inferred that decompression leads to a lower recurrence without the use of adjuvant methods.[12] On the other hand, it is stated that methods such as marsupialization and decompression do not constitute an effective treatment alone because of the possibility of leaving residues in the cavity, excision of the cystic mass is required,[3] other authors accompany the previous argument with the use of Carnoy's solution, due to the low recurrence obtained in the patients,[11,14] it should be noted that whether the lesion is of small size as well as multiple lesions, perforations or expansion of the tissue, a conservative method can be used together with two adjuvants or en bloc resection respectively.

Using adjuvant methods increases the effectiveness of the treatment, because performing enucleation as the sole treatment will be ineffective due to the high probability of epithelial remnants of the keratocyst in the cavity,[10] increasing its future recurrence. The method with the lowest recurrence rate is en bloc resection of the keratocyst, as it involves its complete removal. However, this method can lead to aesthetic, functional, and emotional complications for the patient,[15] and is therefore reserved for more advanced and complex lesions.[6] Methods exist that address future problems in different ways, such as the application of tibial bone grafts followed by enucleation of the keratocyst to preserve the functionality of the jaw, teeth, and inferior alveolar nerve.[13] Several authors reaffirm the use of conservative and adjuvant methods for treating keratocysts. Although the procedure is more time-consuming, it results in a lower recurrence rate compared to the potential for adverse effects on the patient's future aesthetics and functionality.[5,6]

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CONCLUSIONS

Odontogenic keratocysts are most frequently located on the mandibular ramus and lower wisdom teeth, although in this case, they presented in a young patient in their twenties, highlighting the need for a timely and personalized approach. Despite their low incidence in children, their aggressive and destructive nature, along with the high recurrence rate in the third decade, justifies the importance of early diagnosis through radiographic studies, given their typically asymptomatic course. Conservative surgical treatment, accompanied by periodic follow-up, helps reduce recurrence and complications, especially in growing patients, where age should guide reconstructive decisions to preserve anatomical structures. Furthermore, the application of modified Carnoy's solution is confirmed as an effective and safe alternative, capable of decreasing the recurrence rate and ensuring conservative management that prioritizes both function and aesthetics.

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