

# SURGICAL APPROACHES OF EXTENSIVE PERIAPICAL CYST. CONSIDERATIONS ABOUT SURGICAL TECHNIQUE

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## ABSTRACT

*Cystic lesions are frequent in the oral cavity. They are defined as a pathologic cavity with or without fluid or semi fluid material. The inflammatory lesions are more common, such as periapical cysts. These lesions are encountered in dental apex and the pulp necrosis is a very important cause of these cysts. The treatment can be conservative, like a biomechanic preparation of root, used when the lesion is localized, or the surgical treatment, like total or partial lesion removal. When the surgical treatment is realized, the marsupialization or decompression can be done before, and an enucleation after if necessary, and can be done a total enucleation that enucleate the lesion in one surgery. This technique is more used in big lesions. The aim of this case report is to show techniques of treatment of extensive periapical lesion, the advantages and disadvantages of each technique.*

**KEY WORDS:** Periapical cysts; enucleation; marsupialization; bone lesion

## INTRODUCTION

The apical periodontal cyst is part of a group of inflammatory lesions and is originated from remains of epithelial tissue from the

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periodontal ligament. It can be found close to the tooth apex and its etiopathogeny is based in the contamination of the root canal leading to pulp necrosis and, thus, of the periapical region which receive inflammatory stimuli that induce proliferation of epithelial cells (SHEAR, 1999).

Periodontal cysts are common among cystic lesions in the maxilla (52% to 68% of all cysts in the buccal cavity) (KYLLEY, 1977; SHEAR, 1999). The greater incidence is found among adults from 20 to 40 years of age and they are more common in male than females (BHASKAR, 1966) as well as in white than blacks (SHEAR, 1999). The anatomical distribution is connected to some factors such as caries, trauma and restorations, that is, they are more frequent in regions with greater incidence of pulp necrosis (MASS, 1995).

Most cases of periapical lesion do not present any symptom unless an exacerbated inflammatory response is present out of the infection. In this case tumefaction, sensitivity, mobility and/or tooth dislocation and absence of pulp sensitivity can be verified (GIBSON, 2001). In the x-ray it appears as regular periapical transparencies circumscribed by a well defined radiopaque line with loss of the hard lamina at least in the periapical region and possible root absorption. To confirm the diagnosis it is necessary an incisional or excisional biopsy, which should be preceded by a puncture and aspiration.

In the microscopic exam the cystic epithelium is paved and stratified and the capsule has dense fibrous conjunctive tissue and the inner part may contain liquid and scaling cells (SHEAR, 1999; KUC, 2000).

Cystic lesions can receive endodontic (conservative) or surgical (enucleation, marsupialization and decompression)(CARVALHO, 1998) treatments.

The endodontic treatment is limited most of the time to small cystic lesions with a view or as a strategy to reduce lesions to a later surgical treatment. By enucleating it is possible to remove the entire lesion in only one surgical procedure. Decompression and marsupialization are intermediate steps to a definitive treatment. They reduce the cyst to allow further enucleation (SHEAR, 1999; CARVALHO, 1998).

The choice of treatment may be determined by some factor such as the extension of the lesion, relation with noble structures, evolution, origin, clinical characteristic of the lesion, cooperation and systemic condition of the patient.

This study aims to report two cases of apical periodontal cyst of huge proportion treated with different techniques, with their advantages and disadvantages.

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## CASE REPORTS

### *Case 1:*

Male, 27 years old, reporting an increase in volume in the right maxillary region (FIGURA 1) and mobility of the 13<sup>th</sup> element. Clinically, the vestibule was cambered from the 12<sup>th</sup> to the 16<sup>th</sup> element with a healthy looking vestibular mucosa (FIGURE 2). At the x-ray it was possible to observe a radiotranslucent area from the 11<sup>th</sup> to the 16<sup>th</sup> element with a close relation with the maxillary sinus (FIGURE 3).



FIGURE 1 – Initial aspect of the patient. Note the facial asymmetry.



FIGURE 2 – Initial intra-oral view showing the volumetric increase of 13<sup>th</sup> region.



FIGURE 3 – Pre operative orthopantomographic radiography showing the extension of the lesion.

Test of sensitivity was negative for elements 12<sup>th</sup> and 13<sup>th</sup>. Then, a cavity test was done and it was detected pulp necrosis only in the 12<sup>th</sup> element. A coronary opening was done and the tooth was instrumented and a dressing with calcium hydroxide was applied, which was periodically changed and then every 2 months. In this period the surgical procedure under local anesthesia was done with marsupialization. In this moment it was noted a close relation of the lesion in teeth 12 and 13 and its ample extension. The cystic mucosa was sutured in the alveolar mucosa and a dressing with gauze and iodoform was applied (FIGURE 4). A portion of the lesion was sent to microscopic exam that confirmed the diagnosis of apical periodontal cyst. The post operative follow-up was normal and the patient was instructed to proceed adequate local hygienization with a disposable syringe and saline solution (FIGURE 5). One year after the procedure there was a marked reduction of the lesion as seen in the x-ray what allowed its enucleation (FIGURE 6). The material was sent to microscopic exam and again the diagnosis was apical periodontal cyst. The follow-up was normal and the x-ray revealed bone radiopacity in the region suggesting absence of pathology in the area (FIGURE 7). The patient is in the 24<sup>th</sup> post-operative month control and in the last phase of her endodontic treatment.

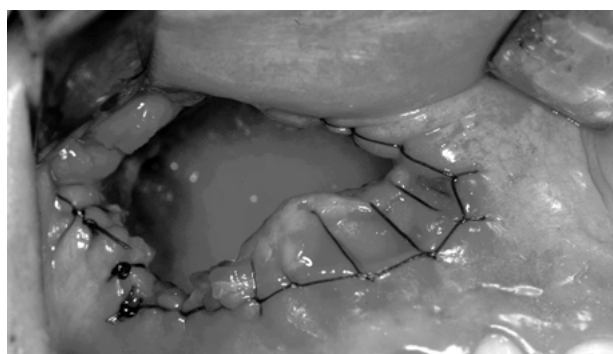


FIGURE 4 – Marsupialization procedure. Suture of the lesion edges to the buccal mucosa.

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FIGURE 5 – One-year follow-up. Intra oral clinical view. Note the regression of lesion and the healthy appearance of the mucosa.

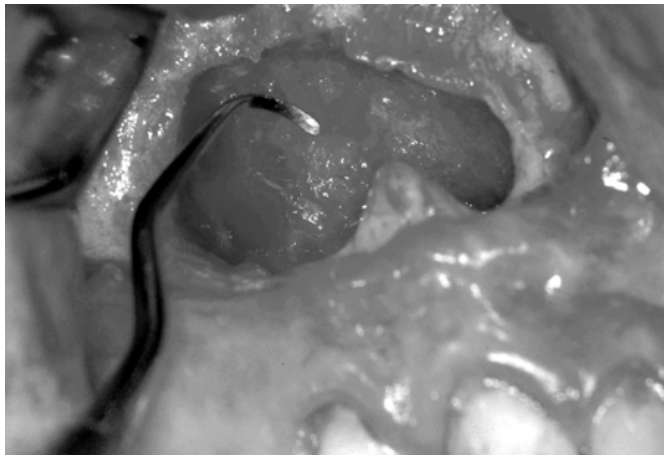


FIGURE 6 – One year follow-up view after enucleation.



FIGURE 7 – Radiography view after 18th. Marsupialization. Note satisfactory bone radiopacity close to the root apex.

### Case 2

Female, 39 years old, complaining of pain and edema in the left maxilla (FIGURE 8) reporting endodontic treatment in the 23<sup>rd</sup> element with drainage of a noticeable amount of secretion through the root duct three months ago.



FIGURE 8 – Clinical view of patient showing increase of volume in the right side.

At clinical exam it was noted a convexity in the vestibular are of the maxilla from distal to the central incisive to the 1<sup>st</sup> molar at the same side. It was also noted that the vestibular mucosa was healthy and crowding teeth (FIGURE 9). At the x-ray a radiotranslucent area was noted form the distal central incisive (21) to the 1<sup>st</sup> molar (26) although the upper limit was not clear at the x-ray (FIGURES 10 and 11). A punction-aspiration biopsy was done revealing a semi-fluid yellowish liquid that was consistent with the diagnostic hypothesis of odontogenic cyst at the pathological exam. A hypothesis was raised of an infected apical periodontal cyst. It was proposed to the patient to redo the endodontic treatment of the 23<sup>rd</sup> element as well as a surgical enucleation of the lesion. After pre-operative clinical routine evaluations the patient was operated under general anesthesia. A Newmann incision was done with a oblique vertical incision close to the distal region of the 11<sup>th</sup> element. After undermining the flaps it was possible to identify that the cystic capsule was not restrict to the lateral bone limits of the maxilla and extended to the region of the superior orbital floor showing medially a convexity of the lateral

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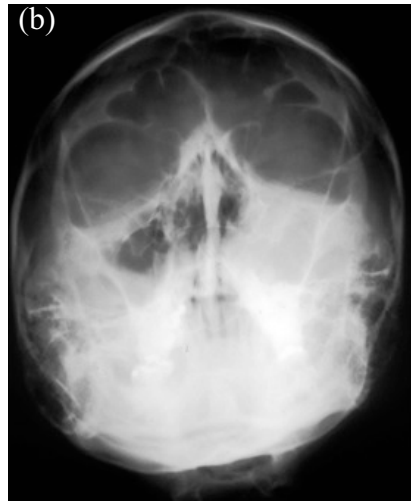
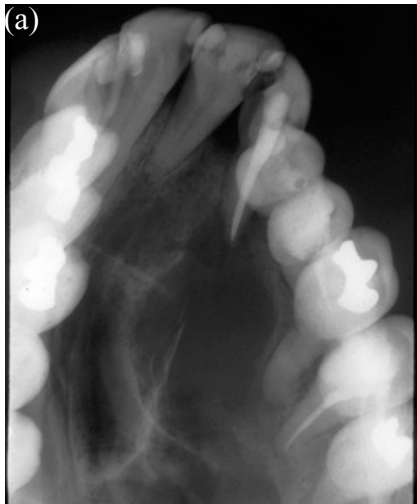
nose wall and in the posterior aspect showing an extension until the maxillary tuber (FIGURE 12). The removed tissue was examined under microscopy revealing a result consistent with apical periodontal cyst (FIGURE 13). The post-operative period was normal. After one month there was not yet normal pulp sensation in the 24<sup>th</sup> element and then an endodontic treatment was indicated. Only after six months was it possible to detect a total decrease in the volumetric increase in the face. After one year the patient presented no complains, the mucosa in the region was normal in spite of the periodontal compromise of these elements (FIGURES a and b). At the x-ray it was possible to observe radiopacity in the region without signs suggestive of pathology (FIGURES 16 and 17).



FIGURE 9 – Intra buccal view depicting marked vestibular convexity.



FIGURE 10 – Ortho pantographic radiography showing the extension of the lesion and its relation with adjacent structures.



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FIGURE 11 – (a) Lateral occlusal radiography showing the relation of the lesion to the root apex. (b) Waters' postero-anterior view showing blurring of the maxillary sinus of the lesion side.

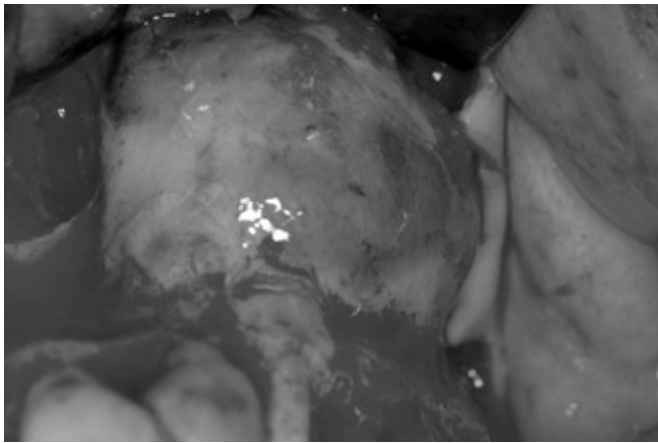


FIGURE 12 – Trans-surgical view. Note the marked lateral expansion of the lesion leading to loss of the lateral wall of the maxilla.

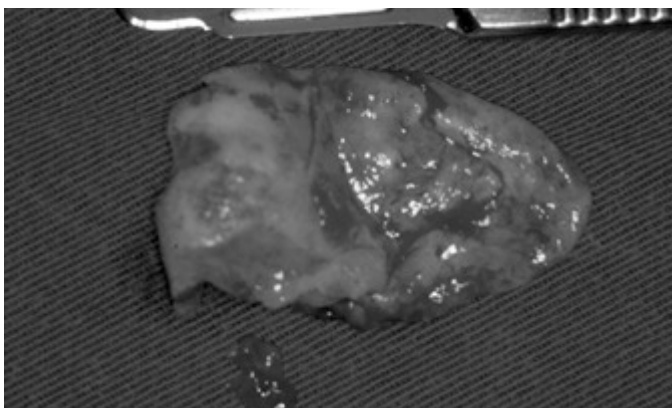


FIGURE 13 – View of the piece after enucleation.



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FIGURE 14 – Aspect of the face of the patient.



FIGURE 15 – An intra-oral view after one year of enucleation.

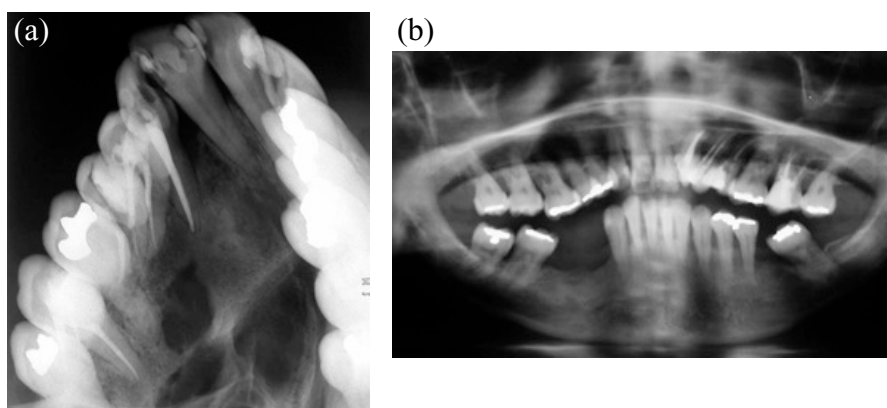


FIGURE 16 – (a) Lateral occlusal radiography. (b) A panoramic radiography suggesting satisfactory bone radiopacity and neofomation.

## DISCUSSION

Apical periodontal cysts are inflammatory lesions leading to bone reabsorption and can reach great dimensions (SHAFER, 1983; NEVILLE, 1995) and become symptomatic when infected or with great size due to nerve compression (GIBSON, 2001).

The treatment of these cysts are still under discussion and many professionals opt for a conservative treatment by means of endodontic technique (HOEN, 1990; REES, 1997). However, in large lesions the endodontic treatment alone is not efficient and it should be associated to a decompression or a marsupialization or even to enucleation (NEAVERTH; BURG, 1982; HOEN et al., 1990; REES, 1997; DANIN 1999).

The treatment should start with a biopsy with puncture and aspiration. An exfoliative cytology can then be done leading sometimes to a presumptive diagnosis. However, the biopsy with partial (incisional) or total (excisional) removal of the lesion should be, in our opinion, the option when large osteolytic lesions in the maxilla are detected (REGEZI, 1999).

In this regard, it seems to us that marsupialization is efficient since with this maneuver it is possible to examine a large and adequate part of the lesion under microscopy and, moreover, the opening done allow the evaluation of the characteristics of the tissue lining the inner aspect of the lesion (BODNER, 1998), revealing possible alterations in the mucosa, which can be decisive to the area for biopsy and to the treatment of the lesion. It should be stressed that all this can not be obtained with decompression maneuvers.

In the decompression technique it is indicated to perform a small hole that should be kept open by transfixing a drain (CARVALHO, 1998). However, this small opening most of the time is not enough to allow adequate hygienization in the post-operative period, which can be long. The difficulty to eliminate food remains from the cavity lead to infection of the lesion and pain. Another factor is that, usually, small orifices close quickly with no regression of the lesion or a secondary infection. It should be noted that this was the case of the first case reported in the study where there was almost a full closure of the opening of the marsupialization.

In the first reported case it was favored an endodontic treatment associated with marsupialization mainly due to the fact that the patient has in the region many teeth with unaffected pulp vitality and was very willing to come to the scheduled follow-up exams. Equally important to this conduct is to warn the patient that,

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for an uncertain period of time, they will have an accessory cavity in the mouth that must be higienized daily, which is a condition that most will not adhere to.

As seen in case 1, it is suggested that the opening of the cystic cavity should be always extensive to avoid expontaneous closing and to facilitate local hygiene. This technique is less risky to anatomical structures and promotes a reduction of the internal pressure of the cyst and, therefore, of the lesion. A long run clinical control should be done until the full regression of the lesion and then its enucleation.

The surgical enucleation of the lesion in a sole step is indicated when there is regression of the lesion with endodontic treatment, in extensive or restricted lesions in which the patient is not collaborative and in situations in which malignity is identified in the lesion.

Case 2 reported an extensive lesion in which the enucleation was indicated because it was less troublesome to the patient. According to the patients report the lesion was 3 months old beginning after a local trauma. Clinically, the periodontal setting was bad with some tooth mobility and poor higienization. At the x-ray only the 25<sup>th</sup> element was free of endodontic treatment and had no response to the test to sensitivity to cold. Taking this into consideration and recalling that comfort in the post-operative period, with no need for constant irrigations, the selected treatment was considered adequate to this case, with the additional advantage of allowing a full examination of the mucosa.

In this regard, it is suggested that the treatment of the apical periodontal cysts should be defined according to the clinical and x-ray evaluations according to each case.

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