

Lateral periodontal cyst does not require endodontic treatment, only surgical!

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ABSTRACT

There is no inflammatory lateral periodontal cyst on the lateral side of the roots, in the same manner as an apical periodontal cyst forms from an immunogenic periapical granuloma. Lateral periodontal cyst is a developmental cyst derived from dental lamina remnants located in the periodontal ligament with limited growth and no inflammatory nature. The involved tooth features pulp vitality and the treatment of the lesion does not require a therapeutic endodontic approach, but only its surgical removal, which already constitutes an excisional biopsy.

Microscopic analysis is essential when the lateral periodontal cyst is removed, given that in their incipient stage some lesions such as ameloblastoma, odontogenic keratocyst and squamous odontogenic tumor may present with the same image and clinical aspects. Prognosis of lateral periodontal cyst is extremely favorable and there is usually no relapse, but the prognosis of these other lesions includes relapses over time and increased clinical aggressiveness for the patient.

Keywords: Lateral periodontal cyst. Odontogenic cysts. Root cyst. Periapical cyst.

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The apical periodontal cyst is an inflammatory cyst

The apical periodontal cyst, also called periapical cyst or root cyst, always originates from an immunogenic periapical granuloma induced by the infected canal microbiota after pulp necrosis.

Immunogenic periapical granuloma constitutes a chronic inflammatory process consisting of macrophages, lymphocytes and plasma cells organized in assembly around the apical foramen of infected canals to contain and delimit the aggressions suffered by fibrous connective tissue and periapical bone. Its installation occurs after a subclinical period in which acute and chronic periodontitis or acute apical pericementitis has developed without evolving to a dentoalveolar abscess.

The apical epithelial rests of Malassez become involved in the structure of the immunogenic periapical granuloma during its installation in the periapical tissues. These epithelial cords and islets, in this context, are affected by the action of inflammatory mediators and the influence of environmental tissue conditions. In their 1967 classic and pioneering study, Grupe, Ten Cate and Zander³ demonstrated that these tissue conditions would be mainly involved in changes in the tension between oxygen and carbon dioxide, which would promote intracellular metabolic changes associated with the induction of epithelial proliferation inside the immunogenic periapical granulomas.

Difference between inflammatory cyst and developmental cyst

Based on the criterion “nature of the process and its causes”, odontogenic maxillary cysts can be classified as follows:

A) **Inflammatory:** When the cyst's appearance and growth are related to a previous or associated inflammation.

B) **Disontogenic:** When the cyst is related to a development different from normal.

The apical periodontal cyst, as it develops from the immunogenic periapical granuloma, is included among the inflammatory odontogenic cysts that affect the jaws. Other inflammatory odontogenic cysts include the paradental cyst and the inflammatory follicular cyst.

All other odontogenic cysts are not inflammatory in their cause and nature, but stem from the process of odontogenic and maxillary development, similarly

to dentigerous cysts, odontogenic keratocysts, odontogenic sialocysts, gingival cysts, among others.

There is no inflammatory lateral periodontal cyst!

The apical foramen constitutes the main route of arrival of microorganisms and their products in apical periodontal tissues.⁴ Lateral, accessory and collateral canals naturally created by foraminae also tend to carry the microorganisms and their products to the lateral surfaces of the dental root. Likewise, cracks, fractures and perforations would also convey them, but there is no well-documented case in the literature that can be classified as an inflammatory lateral periodontal cyst which has necessarily been preceded by a laterally localized immunogenic periapical granuloma.

However, clinically, cystic inflammatory lesions induced by an immunogenic granuloma have never been judiciously reported in the literature, revealing previous pulpal necrosis, and inflammatory microscopic aspects such as in apical periodontal cysts, with imaging showing them in the lateral sides of the roots. The literature mirrors whatever takes place in clinical practice, and inflammatory lateral periodontal cysts are just not found.

In other words, the lateral periodontal cyst is a developmental cyst of the teeth and jaws, derived from dental lamina remnants located in the periodontal ligament.^{2,6,8} The epithelial rests of Malassez may also be the site of origin, but the cellular morphological and biochemical characteristics of the lining epithelium suggest that the dental lamina remnants are the most probable structure responsible for the appearance of the lateral periodontal cyst. The lateral periodontal cyst is defined as a disontogenic cyst in virtually all classification systems.^{5,6} It could therefore be questioned:

1 - What is the logical reason for this absence?

There is no logical explanation, but this is always the case, from a statistical point of view.

2 - What is the clinical importance of observing that lateral periodontal cysts are not inflammatory?

Given that lateral periodontal cysts are developmental lesions and do not require the presence of previous inflammation at the site for its installation, this ex-

plains why all cases present with associated teeth that have pulp vitality (Fig 1), without requiring endodontic treatment for its cure, which will be obtained by periodontal surgical removal. If the tooth is removed and the lesion remains in place, its growth will be very slow (Fig 4). In many clinical cases of lateral periodontal cysts in day-to-day practice, appropriate and definitive

diagnosis was only reached when the tooth had been endodontically treated (Fig 2). Endodontic treatment will not interfere with the prognosis of lateral periodontal cyst and, if influenced, will be negatively affected by the risks posed by secondary contamination. Frequently, these cases, when not yet diagnosed with endodontic treatment, present with fistulas.

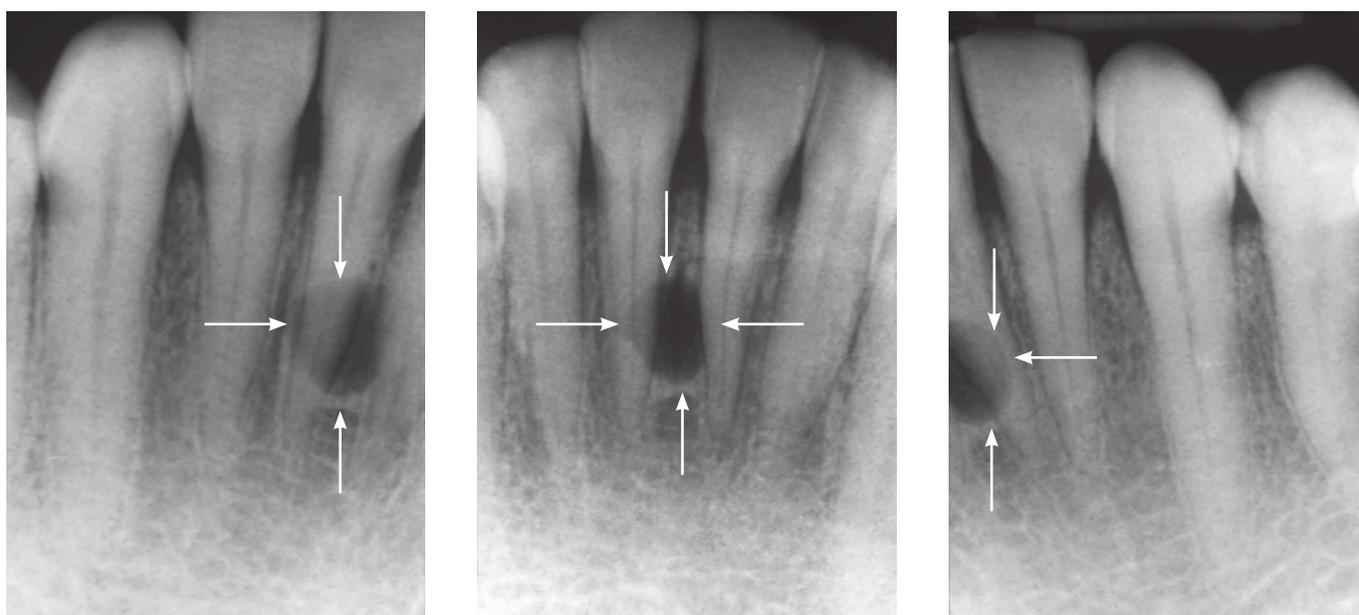


Figure 1. Lateral periodontal cyst in teeth with pulp vitality, without root resorption or tooth displacement.

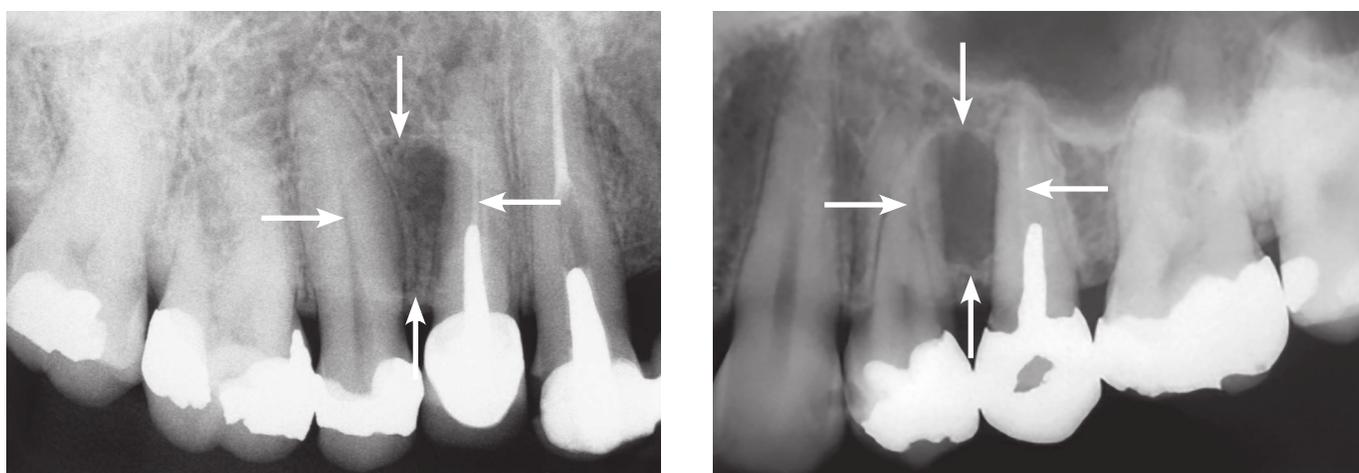


Figure 2. Lateral periodontal cysts in which the initial diagnosis was wrong, and endodontic therapy was applied and did not solve the lesion issue — which should have been surgically removed, without endodontic treatment, since the teeth had pulp vitality.

Criteria for the diagnosis of lateral periodontal cyst

The diagnosis of lateral periodontal cyst should only be definitively determined after the surgical specimen has been microscopically examined. Its microscopic characteristics are peculiar and specific. Some clinical and imaging cases that appear to be lateral periodontal cyst can, under microscopic examination, be in actuality incipient odontogenic keratocysts or some other cystic or tumor odontogenic lesions, such as ameloblastoma, squamous odontogenic cyst, among many others.^{1,4,7}

Patient profile: It affects both genders, with a slight predominance in men.

Clinical aspects: They are asymptomatic and, in general, do not induce root migration (Figs 1 and 2). If they do, they will involve only minor displacements.

They rarely promote perceptible swelling in the buccal and lingual aspects, which induces the patient to seek explanation. Almost always they are discovered by chance in imaging tests performed for other reasons.

Imaging aspects: A radiolucent or hypodense lesion well delimited by radiopaque or continuous hyperdense line, of oval or spherical contour, located, in most cases, in the lower premolars. The lesion very seldom develops a diameter greater than 1 cm in its largest axis.

Primarily, the involved teeth have pulp vitality and are almost always healthy. Despite the proximity to the dental roots, lesions of the lateral periodontal cyst do not induce root resorption (Figs 1 and 2). If an image compatible with lateral periodontal cyst is associated with root resorption, the possibility of ameloblastoma considerably increases.⁷

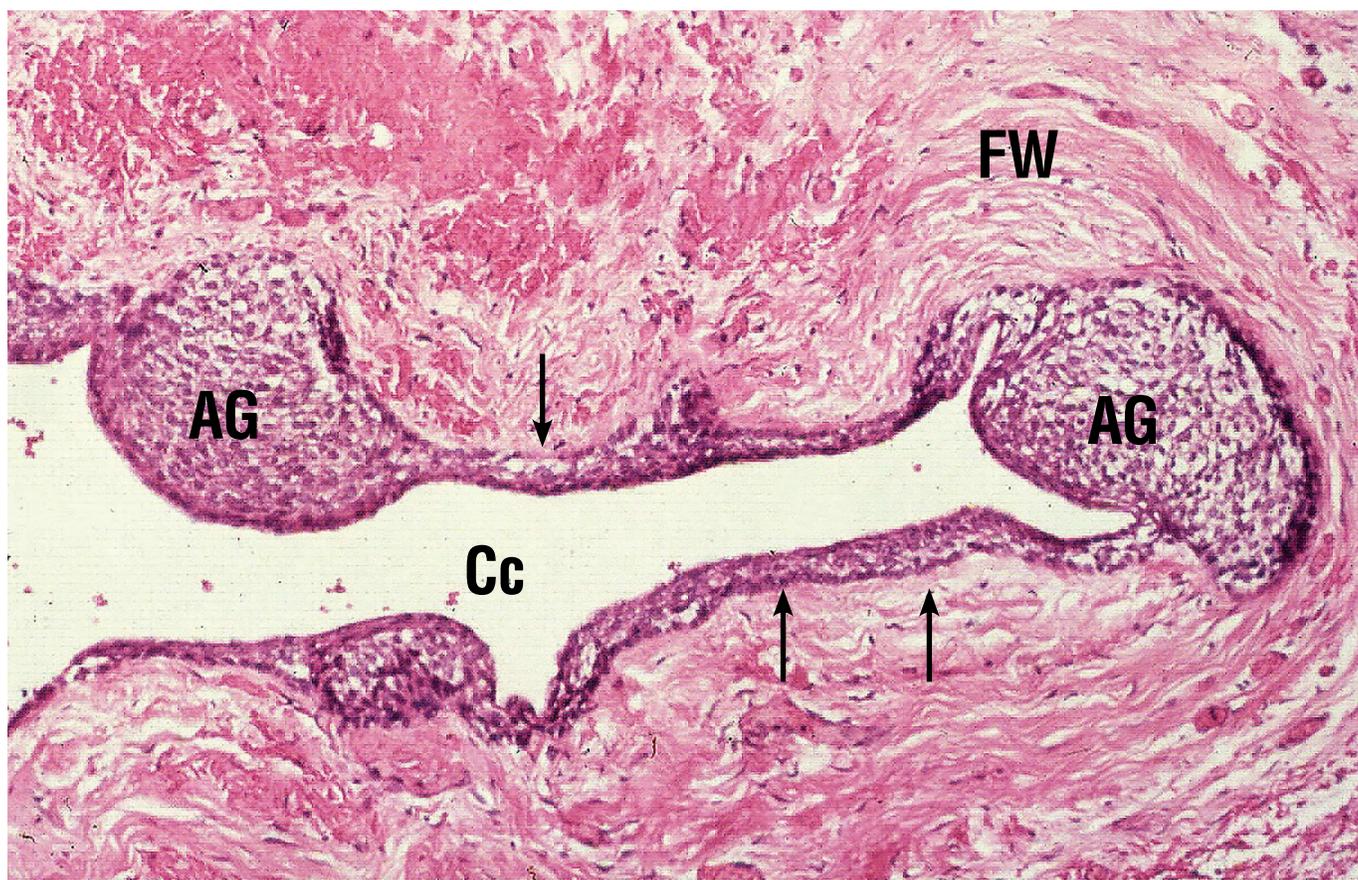


Figure 3. Microscopic aspects of the lateral periodontal cyst with cavity (Cc) coated with epithelium with three to five layers (arrows) and focal regions with nodules or agglomerates of cells with clear cytoplasm (AG). The connective tissue presents without inflammatory infiltrate in the fibrous wall (FW).

When endodontic treatment has been performed, these are usually unsuccessful attempts to solve the problem, which is not of an endodontic nature. In many cases, the involved tooth presents, in these stages, large restorations or prosthetic crown reconstructions (Fig 2).

Microscopic aspects: Cystic cavity without abundant contents in the lumen to the tissue cuts. The epithelial lining is one to five layers, with no defined keratinization. At focal points of the lining, focal button-shaped proliferations or convolutions with clear cytoplasmic glycogen rich cells are observed, such as some cells from the dental lamina (Fig 3). In the cystic fibrous wall, infiltration and inflammatory exudate are not observed in the connective tissue.^{2,8}

Microscopic features are peculiar, but may eventually be found in gingival cysts and botryoids, which are much harder-to-find lesions. Gingival cysts involve soft gingival tissues and the botrioid cyst is multilocular, more aggressive in size and invasiveness. A definitive diagnosis should always take into account the clinical, imaging and microscopic aspects integrated with the patient's profile.

Differential diagnosis: how to reach a definitive diagnosis

Lateral periodontal cysts, even when unilocular and apparently innocent, due to their low aggressiveness, may present with the same clinical and imaging charac-

teristics of the initial stages of an ameloblastoma, odontogenic keratocyst or squamous odontogenic tumor.

If the lesion's imaging exhibits circumvolutions in its contours or a slight multilocularity in the same region, a differential diagnosis should be made with ameloblastoma, odontogenic keratocyst, central giant cell lesion, squamous odontogenic tumor, odontogenic glandular cyst and botrioid cyst. It is extremely rare that a true lateral periodontal cyst is multilocular, to the point that one should doubt its existence in favor of one of the other lesions.

Conducts and treatment

Once the clinical and imaging diagnosis of lateral periodontal cyst has been established, its surgical removal should be arranged, which will also yield the excisional biopsy of the lesion. In general, no margin of safety is required and relapses are infrequent, usually due to incomplete removals.

Transformation of a lateral periodontal cyst into an ameloblastoma or other lesions virtually does not occur. In cases where this has been reported, one should question whether these lesions were mistakenly diagnosed as a lateral periodontal cyst.

The prognosis is very good and no endodontic approach is required at any stage of the diagnostic or therapeutic approach, since the pulp is normal.

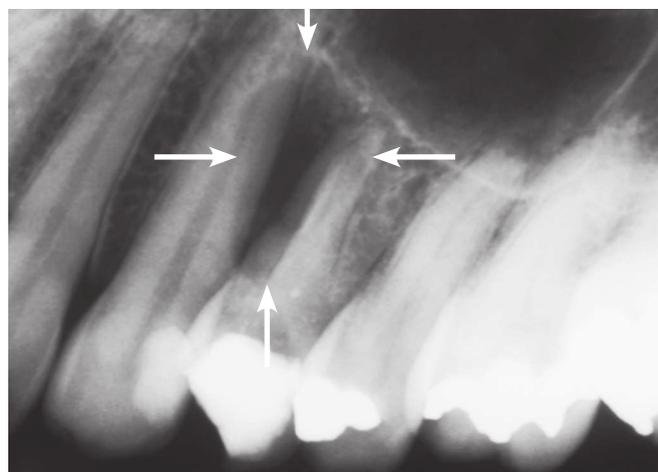


Figure 4. Lateral periodontal cyst in which the initial diagnosis was mistaken and extraction was adopted as therapy. The lesion remained in place and, over the years, increased below the installed prosthesis.

Final considerations

Lateral periodontal cyst is a developmental cyst with limited growth and no inflammatory nature. The involved tooth features pulp vitality and the treatment of the lesion does not require a therapeutic endodontic approach, but only its surgical removal, which already constitutes an excisional biopsy.

Microscopic analysis is essential when a lateral periodontal cyst is removed, given that, in their incipient stage, some lesions such as ameloblastoma, odontogenic keratocyst and squamous odontogenic tumor may present with the same imaging and clinical aspects. Prognosis of lateral periodontal cyst is extremely favorable and there is usually no relapse, but the prognosis of these other lesions includes relapses over time and increased clinical aggressiveness for the patient.

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