

Diagnosis and treatment of lateral periodontal cyst: Report of three clinical cases

Diagnóstico e tratamento de cisto periodontal lateral: relato de três casos clínicos

Abstract

Purpose: Lateral periodontal cyst (LPC) is an uncommon type of odontogenic cyst of development that typically occurs laterally on the root surface of a tooth, representing 0.8% of cysts in the jaws. The objective of this article was to describe the diagnosis of three cases of LPC based on the combined results of pulp vitality test, radiographic examination, and histopathologic analysis, and to display the treatment of these cases.

Case description: The physical, radiographic, and histopathological examinations were carried out in all the three clinical cases presented, confirming the diagnosis of LPC. Surgical enucleation was performed on the three lesions. In the follow-up of the two last cases, there was complete bone regeneration and no recurrences.

Conclusion: Although the occurrence of lateral periodontal cyst is rare, the precision of its diagnosis is necessary so that the correct treatment can be established.

Key words: Lateral periodontal cyst; odontogenic cyst

Resumo

Objetivo: O cisto periodontal lateral (CPL) é um tipo incomum de cisto odontogênico de desenvolvimento que tipicamente ocorre lateralmente à superfície radicular de um dente, representando 0,8% dos cistos nos maxilares. O objetivo deste trabalho foi diagnosticar o CPL associando os resultados de exame de vitalidade pulpar, exame radiográfico e análise histopatológica.

Descrição dos casos: Estes exames clínicos e histopatológicos foram realizados nos três casos clínicos apresentados, confirmando o diagnóstico de CPL. Nas três lesões foram realizadas a enucleação cirúrgica. No acompanhamento dos dois últimos casos observou-se regeneração óssea completa e sem recorrências.

Conclusão: Apesar da ocorrência rara do cisto periodontal lateral, a precisão do diagnóstico se faz necessária para que seja estabelecido o tratamento correto.

Palavras-chave: Cisto periodontal lateral; cisto odontogênico

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Introduction

Cysts lined by epithelium in bone are seen principally in the jaw. A few cysts can result in the inclusion of the epithelium along the lines of embryonic fusion, but the majority is derived from the odontogenic epithelium. Odontogenic cysts are subclassified as cysts of development or inflammatory. Cysts of development are of unknown origin, but do not appear to result from an inflammatory reaction, while inflammatory cysts result from inflammation (1).

The term lateral periodontal cyst is limited to cysts that occur laterally on the root surface and in which inflammatory etiology and the diagnosis of collateral primordial cyst are excluded on the basis of clinical and histologic findings (2). It is believed to originate from the rests of the dental lamina and represents the bone counterpart to gingival cyst of the adult (1). Lateral periodontal cyst affects individuals between the fifth and seventh decade of life, where it is rare in young people under 30 years and does not have a predilection for any race (3). The cysts are frequently found in the region of the pre-molars, lower canines and lateral incisors (1,3-5). The incidence of LPC is 0.8% of cysts found in the jaws (4,6), being more common in men and can manifest clinically as a gingival tumefaction, although normally it is asymptomatic and diagnosed only on radiographic examination (2).

Radiographically, LPC appears as a well-defined radiolucent area, lateral to the root of a vital tooth and with a diameter less than 1 cm (1,2). Occasionally, the lesion can have a polycystic appearance, being then called a botryoid odontogenic cyst. The botryoid cyst shows macro- and microscopically a shape like a bunch of grapes, represents a variant of lateral periodontal cyst, and possibly results from the degeneration of the cyst and subsequent fusion of adjacent foci of rests of the dental lamina (5). The radiographic characteristics of lateral periodontal cyst are not pathognomonic and can resemble an odontogenic keratocyst or lateral radicular cyst (1).

Formerly, the term lateral periodontal cyst was used to describe any cyst that developed along the lateral radicular surface, including lateral radicular cysts and keratocysts. However, lateral periodontal cyst has clinical and microscopic characteristics that are distinct from other lesions that sometimes develop in the same region (1). Histologically, LPC shows a fine epithelial lining of only three-cell thickness and is generally without inflammation. This epithelium consists of flattened or cuboidal epithelial cells with the occasional presence of clear cells that are conspicuous and rich in glycogen (1). Some cysts can show a focal nodular thickening of the epithelial lining, which is composed mainly of clear cells. Its mean annual growth is 0.7 mm (5). Conservative enucleation of LPC is the treatment of choice, where its recurrence is not usual (1,7).

The objective of the present work was to present three clinical cases describing the diagnosis and treatment of LPC.

Description of the cases

Case 1

A female patient, 38 years old, was seen for routine tests. On radiographic examination, a circumscribed lesion was found on the mesial portion of the root of tooth 41 (Fig. 1). The lesion was asymptomatic. A test for pulp vitality was performed and the tooth response to cold was positive. The clinical periodontal examination revealed a probing depth of less than 2.0 mm and absence of tooth mobility. The diagnostic hypothesis was lateral periodontal cyst or keratocyst.

Therefore, surgical enucleation of the lesion was planned. An intra-sulcular incision was made along with a mucoperiosteal flap with vestibular access. The lesion was located at 5.0 mm from the bone crest and there was no rupture of cortical bone. After osteotomy, surgical enucleation was performed with a Lucas and Gracey curette. Next, the bone defect was profusely irrigated with saline and the flap was replaced with internal vertical mattress sutures.

The specimen was fixed in 10% formalin and sent to the Oral Pathology Laboratory of the São Leopoldo Mandic Center for Dental Research for histopathologic examination. On macroscopic inspection, the lesion measured 9×5×5 mm in its largest diameters, and was clear brown in color (post-fixation) with surfaces predominantly convex, and of smooth texture and elastic consistency. Histologic sections revealed a tissue fragment with the presence of fine stratified squamous epithelium and hyperplastic epithelial projections lining a cystic cavity. The presence of a mononuclear inflammatory infiltrate was observed in the stroma. The histopathologic diagnosis was lateral periodontal cyst with chronic inflammation.

Case 2

A female patient, 18 years of age, sought dental care with a complaint of a tumefaction in the anterior palatine region. Radiographic examination showed a circumscribed radiolucent lesion and a radiopaque line between the roots of teeth 11 and 12. Using Clark's technique, it was concluded that the lesion was located in the palate (Fig. 2). The teeth tested positive for vitality. Probing depth was lower than 2 mm.

Based on clinical and radiographic examinations, the diagnostic hypothesis was lateral periodontal cyst or keratocyst. Therefore, surgical enucleation of the lesion was planned. An intra-sulcular incision was made on the palate and a relaxing incision was made distal to tooth 13. A mucoperiosteal flap was raised. There was rupture of the cortical bone and the lesion appeared adhered to the root of tooth 11. Surgical enucleation was performed and the bone defect was profusely irrigated with saline; the flap was then replaced with nylon 5-0 sutures.

The specimen was fixed in 10% formalin and sent for histopathologic examination. The material sent to the laboratory consisted of multiple fragments of soft tissue, measuring 15×15×7 mm, of irregular shapes and surfaces, brownish coloration with blackened areas and fibrous

consistency. Histologic sections revealed fragments of dense connective tissue, well vascularized and exhibiting intense mononuclear inflammatory infiltrate, which in some regions was permeated by neutrophils and hemorrhagic areas. Some fragments showed a lining of epithelium of the stratified squamous type, exhibiting exocytosis, spongiosis and hydropic degeneration. The histopathologic diagnosis was lateral periodontal cyst.

After eight months, the patient returned for a checkup and bone neoformation was observed in periapical and occlusal radiographs. After a year and eight months, the patient returned for re-evaluation and the operated area showed a normal radiographic appearance.

Case 3

A female patient of 65 years was seen for a routine dental examination. Radiographic examination showed a circumscribed lesion with a radiopaque halo, located between the roots of teeth 32 and 33 (Fig. 3). The teeth responded positively to the vitality test and did not display painful symptomatology. Probing depth was less than 1.5 mm and there was no mobility.

Surgical enucleation of the lesion was then planned. An intra-sulcular incision and relaxing incision were made distal to tooth 31, along with a mucoperiosteal flap. As there was no rupture of the cortical bone, access was obtained with a pick and bore. The lesion appeared to be adhered on the distal portion of tooth 32. Enucleation of the lesion was performed with a dental curette and micro-picks. After the removal of the lesion, the area was washed with saline and the flap closed with simple sutures utilizing nylon 5-0.

The specimen was fixed in 10% formalin and sent for histopathologic examination. The material measured three mm in its largest diameter, showed a clear brown color, convex surfaces, smooth texture and elastic consistency. Histologic sections revealed a cystic cavity lined by epithelium composed of two or three layers of keratinocytes and dense connective tissue, along with the presence of erythrocytes. The histopathologic diagnosis was lateral periodontal cyst.

After one year, periapical radiography of the affected region showed complete bone formation.

Discussion

Lateral periodontal cyst appears to originate from the rests of the dental lamina (2). This cyst is lined for the most part by a fine non-keratinized epithelium similar to the reduced epithelium of enamel. A hypothesis has been proposed that it arises initially as a dentigerous cyst that develops by expansion of the pericoronal follicle along the lateral surface of the crown (7). An origin from epithelial rests of Malassez has also been suggested (2).

According to the literature, lateral periodontal cyst shows a predilection for males, mean age of 50 years, and the region of the pre-molars and lower canines (2). Neville et al. (1) reported that 75 to 80% of cases occur in the region of the

lateral incisive, canine and lower pre-molar. In the three case reports presented here, the patients were all women of whom two were older than 50 years, and the region involved was that of the lower or upper central incisors. Rasmusson et al. (5) reported that 69% of 32 cases occurred in men. Carter et al. (8) showed variations in age of prevalence of the lesion and sex, where some patients were young women. However, Shear (2) and Cohen et al. (3) did not encounter any patients less than 22 years old.

Many lateral periodontal cysts normally do not exceed 10 mm (1,2), which was observed in cases 1 and 3, measuring respectively, 9 mm and 3 mm in the largest diameter; in case 2 the cyst measured 15 mm. In the second case, there was rupture of the palatine cortical bone. In none of the three cases did the cyst cause changes in the roots, in contrast to findings by Carter et al. (8) who described the occurrence of perforation of the cortical bone associated with this lesion. There was no loss of pulp vitality in any of the cases, which generally does not occur, unless the dental pulp has been affected in another way.

The histologic appearance of the epithelium in cases 1 and 2 differs from findings in the literature in relation to inflammation. In one of the cases, histology showed a stratified squamous epithelium, with hyperplastic epithelial projections. Shear and Pindborg (10) observed a fine non-keratinized epithelium with local thickening containing clear cells, similar to the reduced epithelium of the enamel. Although there was no observed presence of inflammatory infiltrate in case 3, the first two cases did show chronic inflammatory infiltrate, in which some regions were permeated by neutrophils and hemorrhagic areas. However, a fibrous cystic wall with a variable infiltrate of chronic inflammatory cells can eventually be present in this cyst (1,2,9), which differs from the classic description of this cyst, without inflammation.

The complete regeneration of the lesions after treatments was observed in two cases described here. In the three clinical cases, no type of barrier or graft was utilized after the removal of the lesions, and bone neoformation did occur. Meltzer (6) reported in a clinical case of lateral periodontal cyst complete regeneration of the defects one year after surgery, where no barriers or grafts were used in the treatment of the defects.

Recurrence is uncommon, even though it has been reported as a botryoid variant, probably due to its polycystic nature. There is also the report of an extremely rare case of squamous cell carcinoma which apparently originated from a lateral periodontal cyst (1). Rasmusson et al. (5) reported only one recurrence in their study of 32 cases, where the patient was reoperated 1 year after the first surgery. Therefore, periodic follow-up is necessary after the surgical treatment of this lesion.

In summary, the diagnosis of lateral periodontal cyst should be made by combining the results of the pulp vitality test, which should be positive, radiographic examination and histopathologic analysis. Surgical enucleation is the treatment of choice, and periodic follow-up is recommended.

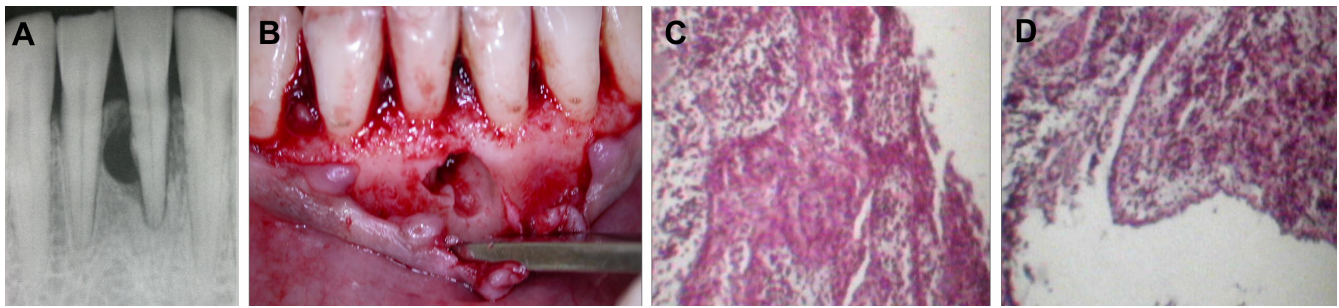


Fig. 1. Case 1. (A) Periapical radiograph shows circumscribed lesion in the mesial portion of the root of tooth 41. (B) Intra-sulcular incision with osteotomy to gain access to the LPC. (C) and (D) Histologic sections show tissue fragment with the presence of fine stratified squamous epithelium with hyperplastic epithelial projections lining a cystic cavity. The presence of a mononuclear inflammatory infiltrate was observed in the stroma.

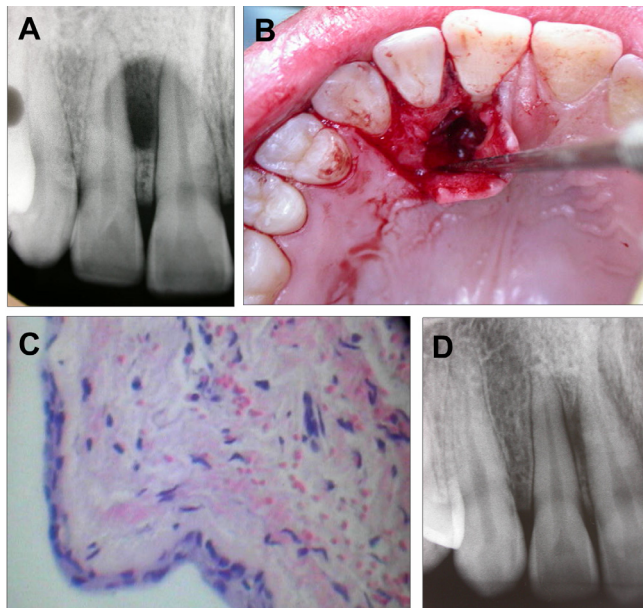


Fig. 2. Case 2. (A) Initial radiograph shows a circumscribed radiolucid lesion between the roots of teeth 11 and 12, located in the palate. (B) Intra-sulcular incision on the palatine side and a relaxing incision distal to tooth 13. The lesion ruptures the cortical bone, appearing adhered to the root of tooth 11, which was later enucleated. (C) In the histologic section, there are fragments of dense connective tissue, well vascularized and exhibiting intense mononuclear inflammatory infiltrate; also observed is an epithelial lining of the stratified squamous type, displaying exocystosis, spongiosis and hydropic degeneration. (D) Radiography showing bone neoformation.

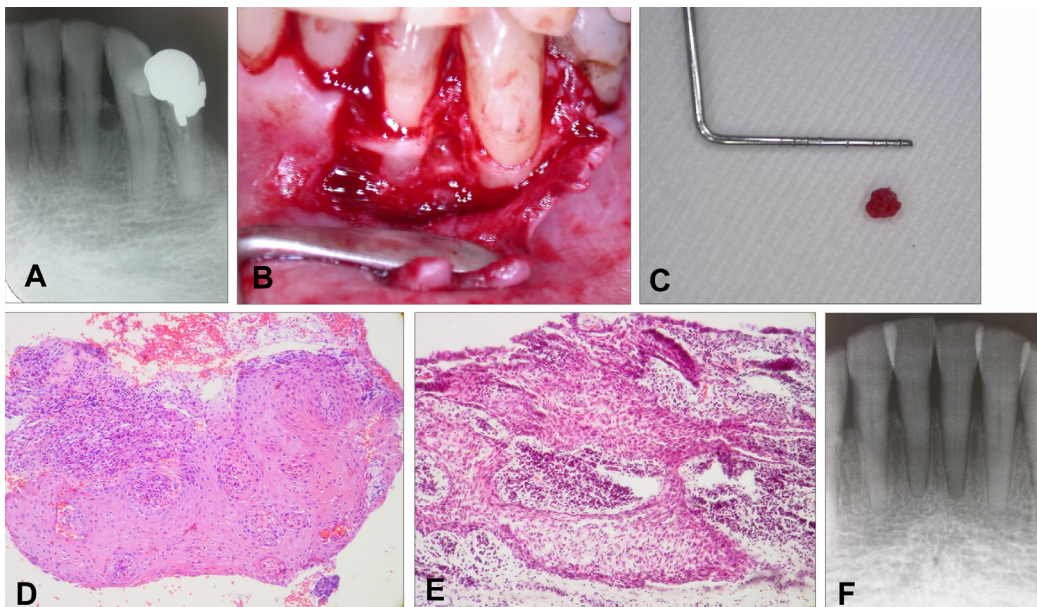


Fig. 3. Case 3. (A) Initial radiograph showing a circumscribed lesion with a radiopaque halo between the roots of teeth 32 and 33.

(B) Intra-sulcular incision on vestibular side and a relaxing incision on mesial side of tooth 42; there was no rupture of the cortical bone. (C) The material measures 3 mm in its largest diameter. (D) and (E) Histologic sections reveal a cystic cavity lined by an epithelium composed of 2 or 3 layers of keratinocytes and dense connective tissue, along with the presence of erythrocytes. (F) Normal appearance in radiograph, 1 year after surgical enucleation.

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