



Case Report

Infected lateral periodontal cyst mimicking periodontal abscess: Report of a case and review of literature

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Abstract

Lateral periodontal cyst (LPC) is a rare developmental odontogenic cyst associated with vital tooth. Lateral periodontal cysts are usually detected incidentally on routine radiographs and do not present with any symptoms. A 55-year-old man reported with occasional pain and pus discharge in gums along lower left front tooth for a duration of two years. During clinical assessment, the lower left mandibular canine (33) had a periodontal pocket of 6 mm labially. The tooth had grade I mobility and gingival recession. There was trauma from occlusion and attrition of lower front teeth. Vitality test of 33 showed normal pulpal response. An initial diagnosis of periodontal abscess was made. Intraoral periapical radiograph (IOPAR) showed a distinct clearly demarcated tear shaped radiolucency with sclerotic border located beneath the mid-root region distal to tooth 33. Considering both the clinical presentation and radiographic evidence, LPC was provisionally diagnosed. Oral prophylaxis with reduction of occlusal trauma followed by conservative enucleation of the cyst along with curettage was carried out under local anesthesia and specimen obtained sent for histopathologic investigation. PRF with bone graft was positioned into the defect. The surgical site was closed with silk sutures and protected with a periodontal dressing. Histopathological examination was consistent with a lateral periodontal cyst. The patient remains under periodic follow-up with good soft tissue healing without any recurrence. The present case underscores the relevance of histopathological examination for a definitive final diagnosis for all intraosseous lesions of the jaw along with clinical and radiographic finding.

Keywords: Bone grafting, Lateral periodontal cyst, Periodontal abscess, Periodontal pocket surgical curettage.

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1. Introduction

Odontogenic cysts are classified as inflammatory or developmental according to their epithelial lining by the WHO in 1992. The term Lateral periodontal cyst¹ applies exclusively to those intra-osseous entity that is seen adjacent to the periodontal space of teeth and when an inflammatory pathogenesis is excluded.¹ The lateral periodontal cyst (LPC) is a relatively rare, usually asymptomatic intraosseous odontogenic cyst of developmental origin. The typical location of LPC is between the roots of vital mandibular canines and premolars, occasionally in the anterior maxilla, and they generally remain asymptomatic. On radiographic examination, the defect presents as a well-defined radiolucent area with a round or teardrop shape. It is most commonly observed in adults between the fifth and seventh decades of life, with an average age of occurrence around 52 years but

can also occur in younger individuals. There is no sex predilection. Because of its typical location, it is often mistaken for an endodontic lesion. Assessing tooth vitality is crucial in the pre-surgical diagnosis of a lateral periodontal cyst, as the absence of teeth or the presence of endodontically treated adjacent teeth may lead to misdiagnosis and improper treatment plan. There are two varieties of LPC: unicystic and multicystic (including botryoid). They are detected during routine radiography and the lesion usually does not produce symptoms because of its non-inflammatory nature, except in cases of secondary infection. Secondarily infected lateral periodontal cyst mimics periodontal abscess and is associated with pain and other clinical features of periodontal abscess. Hence the conclusive diagnosis of a lateral periodontal cyst requires histopathological evaluation after surgical removal.²

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2. Case Report

A 55-year-old male patient in good systemic health presented with occasional pain, discharge of pus, and tooth sensitivity in the lower left anterior region for the past 2 years. The patient gave a history of relief of symptoms following antibiotic intake. The patient denied any traumatic incident involving the tooth. The patient did not have any relevant medical history. On evaluation, the patient's oral hygiene was found to be fair, attrition of lower anterior teeth and spacing between tooth #33 and #34 was noted. Tooth #33 exhibited 4 mm of gingival recession, a 6 mm probing depth on the labial surface, and grade I mobility. Fremitus test was positive in the anterior region suggestive of trauma from occlusion. Considering the clinical findings, a provisional diagnosis of chronic periodontal abscess affecting tooth #33 was established and systemic antibiotics (Cap. Amoxicillin 500mg thrice daily for 5 days; Tab. Metronidazole 400mg twice daily for 3 days) prescribed for one week.

A well-demarcated, teardrop-shaped radiolucent area with sclerotic borders was observed on the distal aspect below the mid-root of tooth #33 on the periapical radiograph. (Figure 1) No remarkable changes were detected in the periapical region. The radiographic features suggested a cystic lesion and surgical curettage in relation to 33 was planned.



Figure 1: Preoperative radiograph radiovisiography imaging with a well-defined radiolucency below mid-root level distal to #33 with a sclerotic border

Oral prophylaxis was performed after symptomatic relief following antibiotic intake. Trauma from occlusion was relieved for tooth #33. Pulp vitality was checked with electric pulp tester (EPT) which showed normal pulpal response for #32 #33 and #34. The patient underwent standard blood investigations, which returned normal values (Table 1). The management involved surgical enucleation and curettage under local anesthesia, with the procedure explained to the patient and written consent obtained.

Table 1: Blood routine examination

| Test | Result |
|---------------------------|-------------------|
| Haemoglobin | 14gm./dl |
| Differential Count | |
| Neutrophils | 49% |
| Lymphocytes | 48% |
| Eosinophils | 03% |
| Monocytes | 0% |
| Basophils | 0% |
| ESR | 08mm / 1HR |
| Platelet Count | 2.86000 / μ l |
| RBC Count | 450000 / μ l |
| Bleeding Time | 1'06'' |
| Clotting Time | 3'24'' |
| RBS | 116 |
| Viral markers | |
| Retroviral Rapid Test | Negative |
| HBcAg Rapid Test | Negative |
| HCV Rapid Test | Negative |

Under local anaesthesia, a crevicular incision was given from #32 to #34. A full-thickness flap was carefully elevated to expose the surgical site. Access to the lesion was achieved through the labial aspect of tooth #33. Conservative surgical curettage was performed. Thorough irrigation of the defect was done using saline. For regeneration of the bony defect, platelet-rich fibrin (PRF) in combination with a xenograft (Osseograft) was used. The surgical site was sutured with 3-0 silk sutures after haemostasis was achieved. A periodontal dressing using Coe-pak was given (Figure 2). The curetted specimen was sent for histopathologic examination. Patient was prescribed antibiotics and analgesics (Cap. Amoxicillin 500mg thrice daily for 5 days; Tab. Ketorol DT twice daily for 3 days) for one week postoperatively. At one week post operative review, sutures were removed. The soft tissue healing was found to be satisfactory.

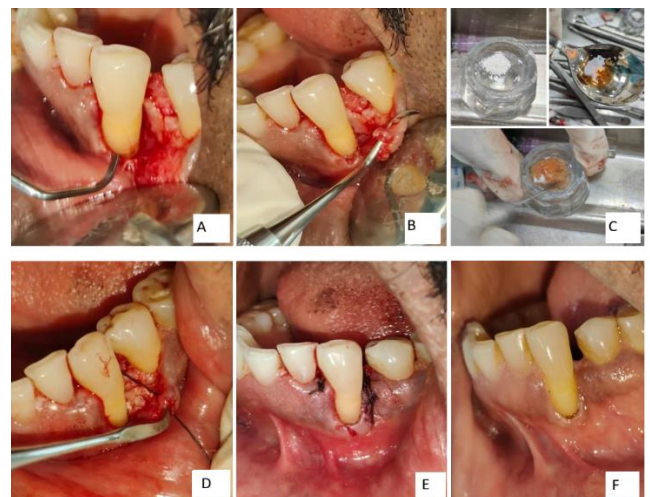


Figure 2: A: Crevicular incision given and flap reflected; B: Surgical curettage done; C: PRF with osseograft; D: PRF with osseograft placed; E: Suture given; F: One month post operative view

The hematoxylin and eosin-stained section showed a moderate to densely collagenous connective tissue wall with mild to moderate, diffuse and focal collection of inflammatory cells, predominantly lymphocytes. At areas, detached and discontinuous lining epithelium which is non-keratinized and 3-5 cell layer thickness can be noted. Histological assessment demonstrated characteristics of a secondarily infected lateral periodontal cyst. (**Figure 3**)

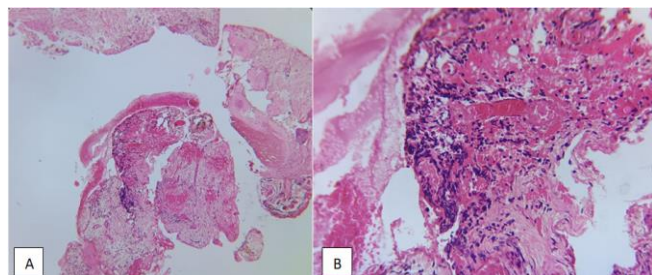


Figure 3: Shows H and E stained histopathograph of the curetted specimen; **A:** Histo pathological examination showing dense to moderately Collagenous connective tissue with moderate diffuse inflammation cell infiltrate with small bits of stratified squamous epithelium, osteoid tissue can also be noticed (10X); **B:** Showing dense to moderately collagenous connective tissue with moderate diffuse collection of inflammatory cells predominantly lymphocytes (40X).

At six months follow up, the patient is asymptomatic with good soft-tissue healing and without any recurrence. (**Figure 4**)



Figure 4: **A:** Six-month post- Operative view showing good tissue healing without recurrence; **B:** Radiographic image showing bone fill after six months follow up

3. Discussion

This case report highlights, the clinical presentation, radiographic finding, histopathological observation and treatment of a lateral periodontal cyst with secondary infection presenting similarly to a periodontal abscess.

The lateral periodontal cyst (LPC) can be described as a rare, harmless, developmental cyst of odontogenic origin that is neither inflammatory nor keratinized, most often, it is situated adjacent to the root of a healthy, vital tooth. These cysts are most commonly found near the mandibular

premolars and canines, although cases have been reported in other regions as well.³

LPC accounts for 0.8% to 2% of all jaw cysts.⁴ Cysts are usually intraosseous and interradicular in position, they are found on radiographic examination between the crest of the alveolar bone and the apex of the tooth. The prevalence of lateral periodontal cyst is usually between 5th to 7th decades of life with the average age at which these cysts occur is 52 years, and with no race or sex predilection.⁵ In the present case also, the patient was in the 5th decade of life and the location of the lesion was in concordance with previous reports.

The first well documented case of lateral periodontal cyst presented in literature was by Standish and Shafer in 1958, later in the same year Holder and Konkel reported lateral periodontal cyst although it was called a Periodontal cyst.⁶ The lateral periodontal cyst develops gradually, exhibiting an approximate growth rate of 0.7 mm per year.⁷

3.1. Signs and symptoms

LPC typically appears as a small swelling in the soft tissue, located beneath or within the interdental papilla between teeth that is still vital, the swelling is asymptomatic as it is not associated with inflammation except when secondarily infected.⁸ In this present case, an infected soft tissue swelling below the interdental papilla between teeth, distal to tooth #33 and was associated with pain, pus discharge, grade I mobility and periodontal pocket depth of 6mm and the patient gave a history of recurrent infection, which led to the initial suspicion of a periodontal abscess.

3.2. Aetiopathogenesis

The aetiopathogenesis of lateral periodontal cyst remains controversial due to different hypothesis in literature. It may be related to the following hypothesis, (1) the reduced enamel epithelium,⁴ (2) remnants of dental lamina,⁹ (3) the epithelial rests of Malassez within the periodontal ligament.¹

As per the hypothesis by Altini M and Shear M, the cyst is lined by non-keratinized epithelium similar to reduced enamel epithelium confirmed through PCNA immunohistochemical expression.⁴ According to Cohen D A et al,⁹ histopathologically, the lateral periodontal cyst presents with clear cell which is rich in glycogen, which can also be seen in dental lamina. Hence dental lamina remnant can be considered in the aetiopathogenesis of lateral periodontal cyst.⁹ Shear M mentioned that since the principle location of epithelial rests of Malassez is the root surface which is also the most often location for lateral periodontal cyst, the epithelial rests can play a role in cystic formation.¹

3.3. Classification

There are two variants of lateral periodontal cyst 1) Unicystic and 2) Multicystic.

The Botryoid odontogenic cyst (BOC) was previously considered a variant of the lateral periodontal cyst,⁴ but Van der Waal opposed this and he observed that BOC can spread beyond the root's lateral surface, therefore, it cannot be regarded as a variant of LPC; however, it is thought that both cysts share the same cellular origin.¹⁰ Some authors state that botryoid odontogenic cyst to be a multicystic version of LPC with both microscopic and macroscopic features resembling a "bunch of grapes".⁹ Except for the multicystic variants, cyst does not extend to a maximum diameter of 10 mm.⁶

3.4. Radiographic features

The lateral periodontal cyst is recognized by chance or coincidental through routine radiographic investigation. It appears as oval; round or tear drop shaped radiolucent area which is well circumscribed with radiopaque rim without involving periodontal space and absence of root resorption of adjacent tooth. The cyst generally lies between the alveolar crest and root apex, and the adjacent tooth continues to be vital.¹¹ In the present case, the intraoral periapical radiograph showed a tear drop shaped radiolucent area with a radiopaque rim which led to the provisional diagnosis of a cystic lesion. This emphasizes the importance of routine radiographs prior to diagnosis and treatment planning.

In this case report, lateral periodontal cyst between mandibular left canine and premolar (# 33, 34) with vital tooth and without any accessory canal on intraoral periapical radiograph and RVG shows typical presentation of the entity.

3.5. Differential diagnosis

The normal anatomical radiolucencies resembling lateral periodontal cyst include mental foramen, nutrient canal and the maxillary sinus.¹² The other differential diagnosis include odontogenic keratocyst (OKC), Gingival cyst, Pseudocyst, lateral radicular cyst and other odontogenic tumours.

The differential diagnosis of these conditions must be entirely based on clinical, radiographic and histopathologic investigation because these can be aggressive with high recurrence rate and different treatment plan.¹³

3.6. Histopathology

The cavity of the cyst is covered by a thin non-keratinized epithelial layer with 1-5 mm thickness. The epithelium shows a palisading distribution. Glycogen-rich clear cells are frequently observed in plaques or at the surface epithelial layers, commonly associated with epithelial thickening or plaque formation.⁷ The presence of epithelial bulges inside the cyst with degeneration of epithelium is suggestive of lateral periodontal cyst.² The connective tissue is composed of mature collagen fibres with zone of hyalinization.⁹ Most cases are not presented with inflammatory cells, however, in certain cases, inflammation may be observed within the fibrous capsule.

In this case, the histopathology section showed a moderate to densely collagenous connective tissue wall with mild to moderate, diffuse and focal collection of inflammatory cells, predominantly lymphocytes. At areas, detached and discontinuous lining epithelium which is non-keratinized and 3-5 cell layer thick can be noted. The histopathological examination was suggestive of a secondarily infected lateral periodontal cyst.

The LPC is to be differentiated from other inflammatory cysts such as OKC, cyst arising from infected lateral accessory canals, unilocular odontogenic neoplasms usually located interdentally. Improper treatment plan will result in unwanted root canal treatment, periodontal surgical procedures, extraction of vital tooth etc.

3.7. Treatment

Successful management of lateral periodontal cysts (LPCs) requires complete surgical removal, either through conservative enucleation or excision with thorough curettage to minimize the risk of recurrence.⁷

Guided bone regeneration (GBR) and resorbable collagen membranes (RCM) have been shown to promote bone fill and restore periodontal integrity in the defect area, achieving favorable healing within 6 months to 1 year.¹⁴ Platelet concentrates, such as leukocyte-platelet-rich fibrin (L-PRF), have been used as an adjunct to surgery, providing a scaffold rich in growth factors that enhance bone regeneration and soft tissue healing following cyst enucleation.¹⁵ Laser-assisted excision with an 810-nm diode laser has also been reported to improve precision during surgical removal, reduce trauma to adjacent tissues, and support predictable clinical outcomes.¹⁶ Together, these approaches demonstrate that combining surgical enucleation with regenerative and adjunctive therapies can optimize bone healing and periodontal health after LPC treatment.

In the present case, rather than employing the usual conservative approach of enucleation alone, we performed a conservative surgical enucleation of the lesion followed by thorough curettage of the bony cavity to remove all pathological tissue and minimize risk of recurrence. Once hemostasis was achieved, the resultant defect was filled with a xenograft (osseograft) to act as an osteoconductive scaffold, and platelet-rich fibrin (PRF) was applied over the graft to enhance soft-tissue healing, accelerate bone regeneration, improve vascularization, and modulate inflammation. This combined strategy of grafting plus PRF harnesses the structural support of graft material together with the biological stimulus provided by an autologous fibrin matrix and growth factors, thereby optimizing regenerative potential and promoting more predictable and faster healing compared with enucleation alone. The tissue obtained was sent for histopathological analysis. Recurrence is unlikely but has been reported in the literature.⁶ The present case has been

followed up for six months and so far, there are no signs of recurrence.

4. Conclusion

The current report highlights an unusual instance of a lateral periodontal cyst that manifested clinically as a periodontal abscess. In the absence of an intraoral periapical radiograph, it could have been wrongly diagnosed and treated as a periodontal pocket abscess. Radiographic examination revealed a cystic lesion with a tear shaped radiolucency and sclerotic margin. Radiographic observations prompted a reassessment of both the provisional diagnosis and the treatment plan. After enucleation, the defect was treated using PRF along with bone grafting. The case under discussion was thus addressed with a conservative method, together with bone grafting and periodontal regeneration.

4.1. Clinical significance

Intraosseous lesions of the jaw can have similar radiographic findings and clinical symptoms. Therefore, histopathological examination should mandatorily be performed for a definitive final diagnosis for all intraosseous lesions of the jaw.

In the differential diagnosis of lateral periodontal cyst, OKC must be considered due to its aggressive and destructive behaviour with high rate of recurrence. Hence, this case report emphasizes the importance of a thorough clinical, radiographic, and histopathological evaluation for accurate diagnosis and appropriate management of such lesions, along with regular follow-up.

4.2 Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

5. Source of Funding

None.

6. Conflicts of Interest

There are no conflicts of interest.

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