

A rare case report of Lateral Periodontal Cyst

Dr. Swati Choudhary¹, Dr. Kehkashan Ehsan Azmi^{2*}, Dr. Aditya Saxena³, Dr. Ankita Khare⁴, Dr. Karan Sublok⁵

¹Professor Department of Oral and maxillofacial Pathology I.T.S Dental College, Hospital and Research Centre, Greater Noida – 201308 E-mail -dr_swati007@yahoo.co.in

ORCID Id- 0000-0001-8008-6323

^{2*}Assistant Professor, PhD Scholar, Department of Oral & Maxillofacial Pathology and Oral Microbiology, Manav Rachna Dental College, MRIIRS, Faridabad, Haryana - 121004, India Email id: dr.kehkashan.azmi@gmail.com

ORCID Id- 0009-0003-7369-0014

³Professor Department of Pediatric and Preventive Dentistry I.T.S Dental College, Hospital and Research Centre, Greater Noida – 201308 E-mail -adisaxen85@gmail.com

ORCID Id- 0000-0002-0767-9656

⁴Reader, Department of Oral & Maxillofacial Pathology and Oral Microbiology, Shree Bankey Bihari Dental College and Research Centre, Masuri, Ghaziabad, Uttar Pradesh - 201015, India

E-mail- ankita.khare14@gmail.com ORCID Id- 0000-0003-1611-315X

⁵Reader, Department of Oral & Maxillofacial Surgery, Shree Bankey Bihari Dental College and Research Centre, Masuri, Ghaziabad, Uttar Pradesh - 201015, India E-mail- Karan.sublok@gmail.com

ORCID Id- 0000-0002-8214-3915

Abstract: The paper presents a case of lateral periodontal cyst (LPC), a rare developmental odontogenic cyst often identified incidentally on radiographs. A 29-year-old male presented with pain and a localized gingival swelling in the right mandibular canine–premolar region. Radiographic evaluation demonstrated a well-defined interradicular radiolucency measuring approximately 0.5 cm in diameter, bordered by a thin radiopaque margin. On vitality testing, tooth 44 responded positively to cold stimulus. The lesion was surgically enucleated, and subsequent histopathological analysis established its developmental odontogenic nature, consistent with a lateral periodontal cyst. Intraoperatively, no communication with the oral cavity was identified. The patient had uneventful healing and remained free of complications during the 1-month follow-up period. This case underscores the importance of considering LPC in the differential diagnosis of radiolucent lesions adjacent to vital teeth. Surgical removal followed by histopathological analysis is crucial for accurate diagnosis and effective management, with relapses being uncommon in clinical practice. This case emphasizes that lateral periodontal cyst should always be considered in the differential diagnosis of radiolucent lesions adjacent to vital teeth, and that prompt surgical enucleation with histopathological confirmation ensures accurate diagnosis, effective management, and a favorable prognosis with minimal risk of recurrence.

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1. Introduction

The cervical health has a significant amount of health contribution to the overall musculoskeletal stability and functional

Lateral periodontal cyst (LPC) is a relatively uncommon developmental odontogenic cyst that primarily affects the mandibular canine and premolar regions. First described by Standish and Shafer in 1958, LPC represents approximately 0.8% to 2% of all odontogenic cysts and is often discovered incidentally during routine dental radiographic examinations.¹ It typically manifests as a well-defined radiolucent lesion adjacent to the roots of vital teeth, characterized by its asymptomatic nature and benign behavior unless complicated by secondary infection.²

LPCs are distinguished by their thin, non-keratinized epithelial lining and fibrous connective tissue wall, which differentiate them histopathologically from other odontogenic cysts like radicular cysts or dentigerous cysts.³ The management of LPCs often involves

conservative approaches such as periodic observation due to their low recurrence rate and favorable prognosis.⁴

This case report details the clinical presentation, diagnostic evaluation, and management of an LPC. By exploring the intricacies of LPC, this report contributes to the understanding of its pathogenesis, clinical implications, and treatment considerations. Understanding such cases aids in proper diagnosis and management, ensuring optimal patient care and outcomes.

Case Description :

A 29-year-old male patient presented with a complaint of pain and swelling in the right mandibular region localized to canine and 1st premolar since 1 year. The symptoms had been intermittent over the past 1 year but were not associated with any particular triggers. There was no history of trauma, and the patient's dental and medical histories were unremarkable.

Clinical Examination :

Upon intraoral examination, a well-defined, swelling was observed in the interdental and attached gingiva on the buccal aspect of the right mandibular canine and 1st

*Author for Correspondence: dr_swati007@yahoo.co.in

premolar area. The overlying mucosa appeared normal, with no signs of inflammation or ulceration. Upon palpation, the swelling was tender and firm in consistency. In dental vitality tests, cold test conducted on the teeth, showed no response for 43 and delayed response for 44, indicating non-vitality of 43 and vital 44. (Figure 1 and 2)

Radiographic Findings :

Panoramic radiograph revealed a tear drop shaped radiolucent lesion with well-defined borders located in the interdental region between the right mandibular canine and premolar teeth root apex and alveolar crest.

Diagnosis

Based on clinical and radiographic findings, a provisional diagnosis of lateral periodontal cyst (LPC) was made. LPC is a relatively uncommon developmental odontogenic cyst that arises adjacent to the roots of vital teeth, typically mandibular canines and premolars. It is characterized by a well-circumscribed radiolucency and is usually asymptomatic unless secondarily infected.

Treatment

Excision of the cyst was done by surgical enucleation under local anesthesia along with extraction of 43 and 44 (Figure 3 and 4). On 1 month follow up, the patient had uneventful healing and showed no signs of complications. Histopathological examination:

H & E stained sections demonstrated odontogenic cystic epithelium of 2-4 cell layer thickness.(Figure 5) Foci of clear epithelial cells interspersed among lining of the cystic epithelium were evident which were also PAS positive. (Figure 6a and 6b) Focal nodular area of epithelial thickening having whorled architecture; appearing in continuity with epithelial lining. The underlying capsule shows mild amount of chronic inflammatory cells infiltrate and few blood vessels.

Discussion

The lateral periodontal cyst (LPC) is a relatively rare developmental cyst that comprises for less than 2% of all odontogenic cysts.^{5,6} It typically appears on radiographs as a well-defined, unilocular radiolucent lesion located between the roots of teeth in the premolar-canine-incisive area, typically affecting individuals in their fifth or sixth decade of life.^{7,8} LPC is often considered as a preliminary diagnosis in such cases, but its diagnosis can be challenging when it does not exhibit all expected clinical and radiological features. In some instances, LPC may be found in atypical locations such as periapically or as larger multilocular radiolucencies, known as "botrioid odontogenic cysts." Differential diagnosis in these cases is crucial to distinguish LPC from more aggressive conditions such as ameloblastomas or odontogenic keratocysts. This differentiation relies on thorough clinical assessment and histopathological examination, which reveal distinct characteristics of LPC compared to other cystic lesions found in the jaw.^{9,10}

The pathogenesis of LPC is thought to involve three main hypotheses: the reduced enamel epithelium¹¹, remnants of the dental lamina¹², and cellular remnants of Malassez.⁷ According to the reduced enamel epithelium hypothesis,

LPCs are lined with nonkeratinized epithelium that resembles reduced enamel epithelium, supported by PCNA immunohistochemical expression. The second theory suggests LPCs originate from remnants of the dental lamina, as evidenced by the presence of glycogen-rich clear cells histopathologically. The third hypothesis proposes that LPCs arise from epithelial remnants of Malassez located on the root surface, a key location for LPC development. It is crucial to restrict the diagnosis of LPC to cysts located on the periodontal side. Distinguishing LPC from inflammatory cysts and keratocystic odontogenic tumors requires careful evaluation of clinical, radiographic, and pathohistological findings. These diagnostic criteria are essential for accurately identifying LPC and ensuring appropriate management.¹¹⁻¹³

Histological analysis is the gold standard for the diagnosis of LPC and this cyst is characterized by a non keratinized epithelial lining with a thickness of 1 - 5 cell layer, which resemble the reduced enamel epithelium showing focal thickenings and clear cells. The epithelium lining can be rich in epithelial plaques composed of the clear fusiform cells rich in glycogen. Some areas of the epithelial thickening, referred to as plaques or theca, are commonly found, and the connective tissue subjacent to the epithelium exhibits a zone of hyalinization. Inflammation is not a feature and the walls of the cyst consist of mature collagen fibrous tissue.¹³⁻¹⁵ However, it is possible to observe the histopathological variant of LPC - botryoid cyst, that should receive a greater attention considering the rate of recurrence and unusual presentation.^{16,17} The botryoid cyst represents a histopathological variant which presents with multilocular cystic "grapelike" appearance in the bone. Histopathologically it shows multiple cystic spaces lined by nonkeratinized stratified squamous epithelium.^{17,18}

Conclusion

The lateral periodontal cyst should be included in the differential diagnosis when a radiolucent lesion is observed next to the roots of vital teeth. Confirming the diagnosis requires histological examination. The preferred treatment is surgical removal, followed by histological analysis. Relapses are infrequent.

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Figure 1



Figure 2 Figure 1 & 2: well-defined, swelling in the interdentum and attached gingiva on the buccal aspect of the right mandibular canine and 1st premolar area



Figure 3

Figure 3: Postoperatively after surgical enucleation of the cyst and extraction of 43 and 44



Figure 4

Figure 4: Excised soft tissue specimen along with extracted 43 and 44

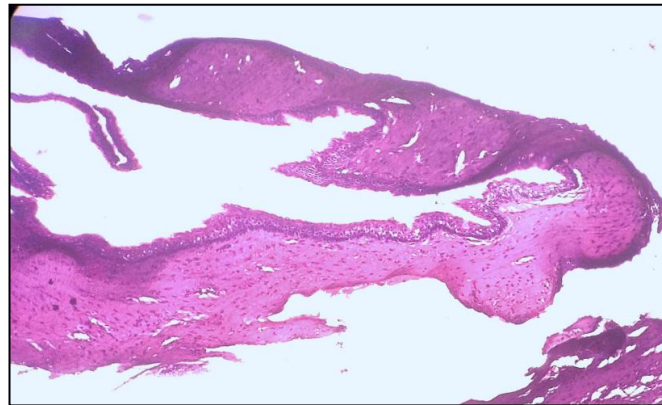


Figure 5: H & E stained sections demonstrated odontogenic cystic epithelial lining of 2-4 cell layer thickness with focal nodular area of epithelial thickening.

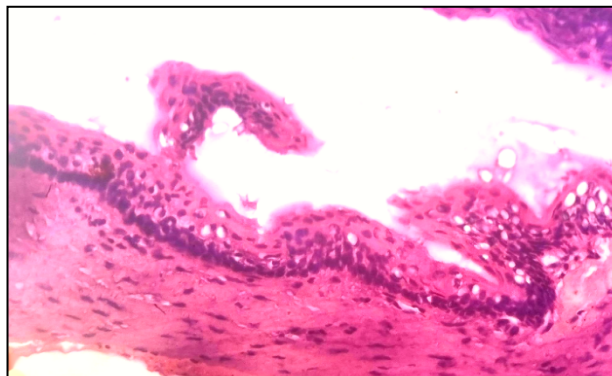


Figure 6a: Foci of clear epithelial cells

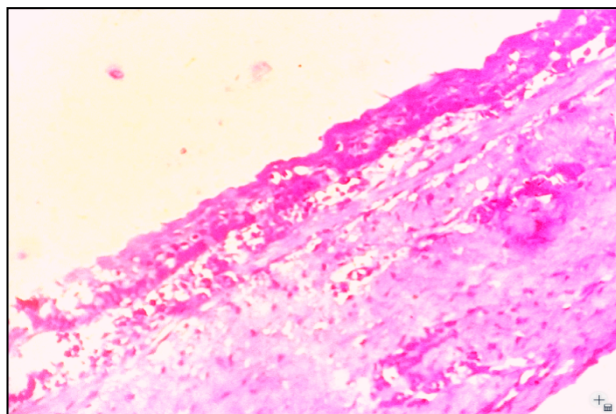


Figure 6b: PAS positive clear epithelial cells