Understanding Lateral Periodontal Cyst: A Case Report

Monica Roy Chandel1 Kundendu Arya Bishen2 Nikit Agrawal3 Himanshu Singh4

1Department of Oral and Maxillofacial Surgery, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India
2Department of Oral Pathology and Microbiology, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India
3Department of Oral and Maxillofacial Surgery, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India
4Department of Oral Pathology and Microbiology, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India

Address for correspondence Kundendu Arya Bishen, MDS, PhD, Department of Oral Pathology & Microbiology, Index Institute of Dental Sciences, Malwanchal University, Indore 452016, Madhya Pradesh, India (e-mail: kundenduarya@gmail.com).

Lateral periodontal cysts (LPCs) are developmental in origin and are typically seen in the canine-premolar area in the mandible and less commonly in the maxilla. Reported rate of incidence of LPCs is less than 1%, and LPCs represent only 0.8% of entire central cysts of the maxillary bone. Despite its unique clinical and radiological presentation, it is finally diagnosed due to its unique histological characteristics. Here, we present one case with characteristic findings. The routine hematoxylin and eosin–stained sections revealed reduced enamel epithelium-like cystic lining that is made of thin, nonkeratinized stratified squamous epithelium along with some epithelial plaques. The clinical-radio-pathological correlation affirmed the diagnosis of LPC. The pathogenesis of LPC has been discussed.

Abstract

Lateral periodontal cysts (LPCs) are developmental in origin and are typically seen in the canine-premolar area in the mandible and less commonly in the maxilla. Reported rate of incidence of LPCs is less than 1%, and LPCs represent only 0.8% of entire central cysts of the maxillary bone. Despite its unique clinical and radiological presentation, it is finally diagnosed due to its unique histological characteristics. Here, we present one case with characteristic findings. The routine hematoxylin and eosin–stained sections revealed reduced enamel epithelium-like cystic lining that is made of thin, nonkeratinized stratified squamous epithelium along with some epithelial plaques. The clinical-radio-pathological correlation affirmed the diagnosis of LPC. The pathogenesis of LPC has been discussed.

Keywords
► lateral periodontal cyst
► pathogenesis of lateral periodontal cyst

Introduction

Lateral periodontal cyst (LPC) is a rare and strange form of developmental odontogenic cyst.1 Mandibular premolar area appears to be the most common location for LPCs, but presence of this cyst on various other sites is also reported.2 LPCs appear to arise in intimate association with root surface (lateral) of erupted tooth.3 Among developmental odontogenic cysts, the incidence of LPC is quiet low. The mean age of occurrence is 52 years with predilection for occurrence in age ranges from fifth to seventh decades and no predilection for race or sex.4 Histopathologically, LPCs are classified under developmental cysts with lumen lining showing thin, nonkeratinized epithelium that is mostly one to five cell layers thick—resembling reduced enamel epithelium. The epithelial lining illustrates focal thickenings or plaques where clear glycogen containing epithelial cells are seen. The connective tissue underlying to the epithelium exhibits zone of hyalinization.5 Radiographically, a well-delineated ovoid or round radiolucent area with a sclerotic margin and maximum diameter of 1 cm is seen on lateral surface of root of teeth. The multicystic variant of LPC is known as botryoid odontogenic cyst (BOC) due to resemblance of the macroscopic and microscopic features with “bunch of grapes.”

Case Presentation

A male patient, aged 50 years, visited to a dental practitioner with a chief complaint of swelling on cheek area and pain in area of the right lower back teeth. Clinical inspection revealed a well-circumscribed and a well-defined ovoid swelling of size 2 cm × 1 cm on the lower right canine to premolar region (►Fig. 1). The swelling was nontender in nature, and there was absence of any pulsations. Clinically the teeth were noncarious and vital.

Radiographic examination affirmed a well-defined radiolucency (pear-shaped) in the upper and middle third of 43 and 44 with a sclerotic border. Also, interdental bone loss was clearly evident in between them (►Fig. 2). Based on aforementioned findings, a diagnosis of LPC was given clinicoradiologically.
The treatment plan comprises total surgical enucleation of cyst. Local anesthesia was administered, and after achieving the desired effect of local anesthesia, mucoperiosteal flap with full thickness was elevated. The cystic capsule was detached from the neighboring bone, and a complete enucleation of the lesion was done using a surgical curette. The cyst capsule was sent for microscopic evaluation.

Histopathology examination of the tissue capsule was done. The hematoxylin and eosin–stained sections revealed a single cavity lesion lined by two to three layered squamous epithelium. In the epithelial lining, some clefts were seen and few areas formed of thick cluster of cells in midst of which clear cells were also observed (Fig. 3). The connective tissue capsule was fibrous, and inflammation was present in few places. The histopathological findings confirmed the clinical diagnosis of LPC.

Discussion

LPC is a bizarre but well-recognized form of developmental cyst of odontogenic origin. The LPCs amount for less than 2% of all jaw cysts, which are epithelium lined. LPCs most commonly appear in patients in their fifth or seventh decade of life; barely it occurs in patients younger than 30 years. The most common location seen is premolar region of the mandible, followed by the maxillary anterior region.

Clinically, LPCs appear to be symptomless and are accidentally detected during routine radiological investigation. Occasionally, if cyst is located on the labial surface of the root, a slight swollen mass may be obvious, although the overlying mucosa usually appears to be normal. Unless otherwise infected, the associated tooth is always vital. If the cyst becomes infected, it may resemble a lateral periodontal abscess.

Radiological examination reveals that the cyst develops as a well-circumscribed radiolucent area placed laterally to roots of a vital tooth. Most of them are less than 1 cm in their greatest diameter. In most cases, the border is definitive and is even surrounded sometimes by a thin layer of sclerotic bone.

The origin of LPC is quite debated. Demonstration of origin of LPC from any specific source is lacking, and therefore any hypothesis about its origin must be established on base of presumptive evidence. Histopathological studies have revealed that LPCs are usually deficient of inflammatory
component. Though it may be present at a distance from the lining, it is suitable to regard them as actuality of developmental origin. LPC seems to be derived from either reduced enamel epithelium or cell rests of Malassez or remnants of dental lamina.

According to the histopathological description, most of the part of the cyst lumen is lined by a definite nonkeratinized epithelium that may be reduced enamel epithelium, and hence there may be a possibility of origin of cyst from it. On the other hand, Wysocki et al (1980) have proposed that the LPCs may have originated from clear cells of dental lamina. They proposed that the LPC is derived from postfunctional cells of dental lamina. They emphasized that the clear cells consisting of glycogen may be demonstrated in the remnants of dental lamina and that identical cells also appear in parts of LPC lining and also in the epithelial plaques of LPC lining. Another proposed possibility of origin of LPC is that it arises from the remnant cells of Hertwig epithelial root sheath (cell rests of Malassez). These cell rests of Malassez are present in periodontium from where they may get arranged in LPC. The support for this theory of origin is insufficient.

Histologically, the LPCs are described as cysts with nonkeratinized thin (one to five cell layers thick) epithelial lining, which closely coincide with the appearance of reduced enamel epithelium. Cuboidal or columnar epithelium may also be seen constituting the lining of cyst. Focal aggregates of glycogen-rich clear cells may be found amidst the epithelial cells of cyst lining. Characteristically, few cysts present with focal nodular thickenings of epithelial lining, which mainly comprises clear cells. Also, sometimes clear cells epithelial rests are seen within the fibrous walls. A striking feature seen in number of LPC cases is the presence of localized epithelial line thickening or plaques. Sometimes the epithelial plaques may be small; other times they may be larger and may protrude into the encompassing cyst wall producing mural bulges. These plaque cells are fusiform having their long axes parallel to the basement membrane. Generally, they are clear, large as well as with small and pyknotic nuclei.

Based on the histological study at the light microscopy level, the usual sequence of development appears to be that there is proliferation of flat basal cells that produces a modest localized epithelial thickening. Though the actual reason behind these localized epithelial thickenings is not acknowledged, it seems to be the result of an instinctive process that influences the lesions of the odontogenic epithelium and in reduced enamel epithelium.

According to Weathers and Waldron, BOC is a polycystic type of the LPC, named so because the sample resembles an array of grapes. It is noninflammatory, developmental odontogenic cyst having predilection for occurrence in the lower canine to the premolar region. Swelling with pain and parasthesia is a frequent symptom shown. BOCs are larger cysts than LPCs, their size ranges from 4 to 4.5 mm, and they can be unilocular to multilocular. They exhibit thin connective tissue septae, which is lined by thin nonkeratinized stratified squamous epithelium. Redman et al (1990) postulated that the BOCs may show multicentric origin. They supported the theory that in some patients, multiple LPCs develop in close proximity. According to them, if such a case is left untreated, these multiple LPCs can fuse to form a larger multicystic lesion that is referred as botryoid variety. Altini and Shear (1992) stated that with continuous growth, LPC can take on botryoid (grape-like) appearance. They proposed a hypothesis about “a unicystic LPC progressing to a multicystic-encapsulated lesion, and then how the progressive enlargement of the multiple microcysts lead to development of botryoid cyst—an irregular thin-walled multicystic structure.”

They categorized LPCs into three types, on basis of morphology:

- Unicystic
- Multicystic
- Botryoid

Contradicting this, Van der wall stated that BOC cannot be contemplated as LPC variant because it extends beyond the root (lateral area), though he did not oppose that the possibility of origin of cells for both cysts are same.

If the lesion is found to be unilocular on radiological examination, LPC is managed by surgical enucleation. Though sacrificing of the tooth involved is avoided, but it is not always possible. Recurrence is not a common feature of LPC, but it is noted in case of botryoid variant.

**Conclusion**

LPCs are rare and an uncommon odontogenic cyst. Although periodically reported, chances of their recurrence are rare. During enucleation of cyst, appropriate care must be taken not to destruct the root of neighboring teeth. For the definite diagnosis of LPC, the histopathological examination of entire specimen is important.

**Note**

Prior to this publication, this study was not published anywhere else.

**Funding**

None.

**Conflict of Interest**

None declared.

**References**