

## Lateral periodontal cysts: A retrospective study of 11 cases

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### Abstract

**Objective:** To describe the clinical, radiological and histopathological features of lateral periodontal cysts among patients diagnosed in different centers (Vall d'Hebron General Hospital, Granollers General Hospital, the Teknon Medical Center, and the Master of Oral Surgery and Implantology of the University of Barcelona Dental School; Barcelona, Spain).

**Study design:** A retrospective observational study was made of 11 lateral periodontal cysts, all of which were diagnosed following a thorough clinical examination, radiological study and posterior histological study.

**Results:** The mean patient age was 37 years, and males predominated over females. The mean lesion size was 1.25 cm. A single relapse was recorded 7 years after removal of the initial lesion. All the cysts were surgically removed.

**Discussion and conclusions:** Lateral periodontal cysts are very infrequent, and are characterized by the preserved vitality of the adjacent teeth. Identification of the lesion is initially based on the clinical findings, though histological study is required to confirm the diagnosis.

The treatment of choice is the surgical removal, though occasional relapses have been documented.

**Key words:** Lateral periodontal cyst, developmental odontogenic cyst, preserved tooth vitality, epithelial plaques.

### Introduction

Since the last maxillary cyst classification of the World Health Organization (WHO), described by Kramer et al. in 1992, lateral periodontal cysts (LPCs) have been regarded as an independent condition (1).

LPCs are defined as non-keratinized and non-inflammatory developmental cysts located adjacent or lateral to the root of a vital tooth (1).

The clinical manifestations tend to be mild, and the diagnosis is generally established by means of a routine radiological exploration, which reveals a radiolucent image with less than 1 cm in size in most cases (2-8). LPCs account for

between 0.8% (2) and 1.5% (3) of all maxillary cysts.

Histologically, these cysts are characterized by the presence of epithelial remnants originating from the dental lamina (known as rests of Serres), and by the visualization of epithelial plaques composed of clear fusiform cells (rich in glycogen). LPCs are delimited by a cubic or non-keratinized squamous epithelium composed of 1-5 layers of cells displaying a palisade distribution (1,9,10).

Botryoid cysts represent a polycystic variant of LPC, first described in 1973 by Weathers and Waldron (11), and are characterized by the presence of a multilocular image. These lesions have a high tendency to relapse (1,9,12,13).

The patient age range is broad, although there is a clear predominance of males in the fifth or sixth decade of life (3,5,7).

A key requirement is the differential diagnosis of these cysts of epithelial origin with more common epithelial (follicular and primordial) and inflammatory cysts (radicular and residual)(1,8,9,14-17).

Based on the cases treated in our Service, the present study describes the clinical, radiological and histopathological characteristics of LPCs, as well as their treatment and the relapses observed.

### Patients and Method

A retrospective observational study was made of 11 lateral periodontal cysts (LPCs) diagnosed and treated in the period 1970-2004 in Vall d'Hebron General Hospital (1976-1988), Granollers General Hospital (1976-1988), the Teknon Medical Center (1995-2005), and in the context of the Master of Oral Surgery and Implantology of the University of Barcelona Dental School (Barcelona, Spain) (1997-2005). All the cases were identified from the histological diagnosis of the biopsies performed. The histological diagnostic criteria were the presence of rests of Serres, a squamous non-keratinized or cubic epithelium composed of 1-3 cell layers, and epithelial plaques composed of fusiform clear cells.

The following data were collected by a single observer: age, gender, lesion size, variant, location, treatment provided, histopathological features, follow-up period, and appearance of relapses.

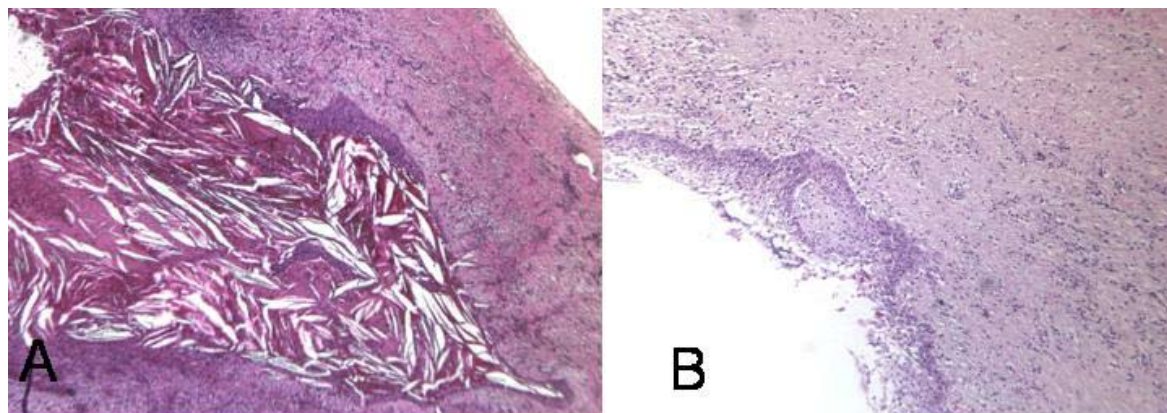
The data were processed with the Statistical Package for Social Sciences version 12.0 (SPSS; SPSS Inc.; Chicago, Ill, USA; license of the University of Barcelona).

### Results

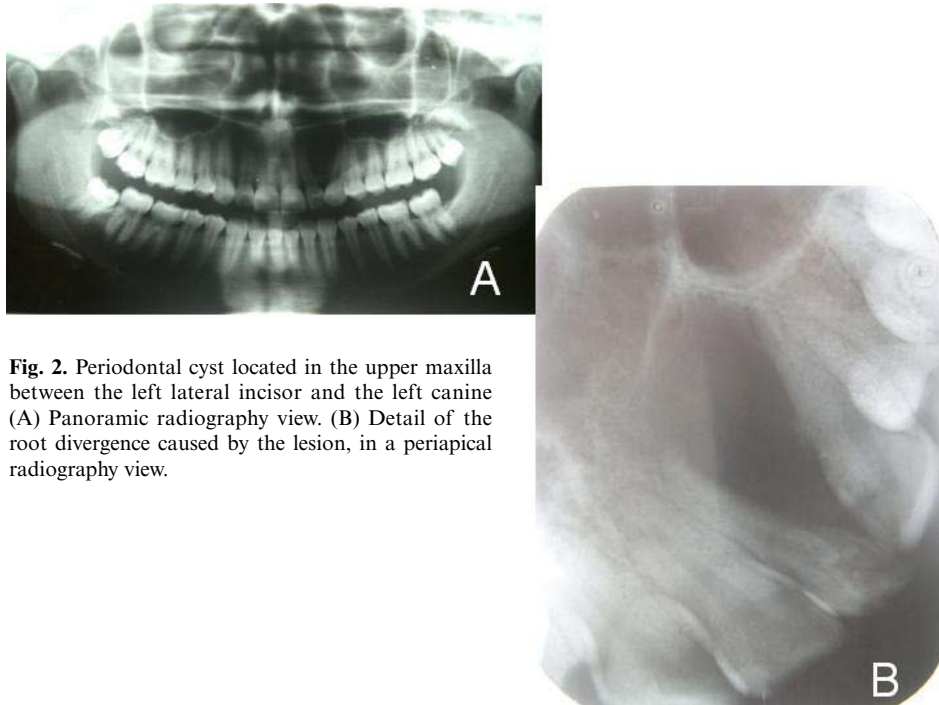
The mean patient age was 37 years (range 18-71 years), with a slight male predominance (6:5). In all cases the lesions were diagnosed on occasion of a routine radiological study indicated for some other reason. The panoramic radiography revealed a rounded or oval radiolucid image, usually located at mandibular premolar level or in the anterior region of the upper maxilla (Figures 2 and 3). In 8 cases an inverted pear-like image was noted (upper maxilla), while the remaining three lesions were rounded or oval (mandible). In the upper maxilla, the 8 lesions were all located in the anterior sector between the lateral incisor and the canine (Figure 4). In contrast, in the mandible, two cases were located in the canine-premolar region (Figure 5), while the third lesion was located in the posterior zone at second molar level. The lesions measured between 0.4 and 2.5 cm in diameter, with a mean of 1.25 cm. The largest lesions were found in the upper maxilla.

Treatment was surgical in all cases, and consisted of removal and posterior histological evaluation of the lesion. No endodontic treatment or periapical surgery of the affected teeth was carried out, since all proved vital.

A single relapse was recorded. This case corresponded to a 35-year-old woman who developed an identical image in the same zone, 7 years after removal of the initial lesion located in the anterior zone of the maxilla. In this case an additional surgical procedure was carried out followed by histological study to confirm the initial diagnosis of LPC (Figure 1A).



**Fig. 1.** (A) Lateral periodontal cyst. Histological view of case #7. (B) Histological section of the enucleated lesion following relapse, 7 years after removal of the initial cyst.



**Fig. 2.** Periodontal cyst located in the upper maxilla between the left lateral incisor and the left canine (A) Panoramic radiography view. (B) Detail of the root divergence caused by the lesion, in a periapical radiography view.



**Fig. 3.** Large lateral periodontal cyst located in the mandible between the left central and lateral incisor.



**Fig. 4.** Intraoperative view following surgical removal of a lateral periodontal cyst in the upper maxilla.



**Fig. 5.** Intraoperative view following surgical removal of a lateral periodontal cyst located between the left lower canine and first premolar.

## Discussion

Most authors report a low incidence of LPC. In effect, these lesions represent up to 1.5% of all maxillary cysts (3) – a fact that explains the few LPC case series found in the literature.

LPCs are generally detected in patients in the fifth or sixth decades of life, though there have been reports of patients between 14 and 84 years of age (2,3,5,7). Our series likewise showed a predominance of patients in the 40-60 years age range. Another important epidemiological aspect described by Rasmusson et al. is that LPCs are much more common in males than in females (proportion 22/10)(7). In the present study the male predominance was less notorious (6/5).

As regards the location of these lesions, the mandible is generally the most affected region (particularly at premolar level), followed by the zone between the upper lateral incisor and canine (3,5,7,9). However, in our series the maxilla was the most affected arch (8/3).

This variant located in the upper maxilla was referred to as globulomaxillary cyst by the 1978 classification of the WHO (18), though posteriorly it was included as a subdivision of LPC in the classification of 1992 (1).

A number of theories have attempted to explain the etiology of LPCs. These lesions are now believed to originate from odontogenic epithelial remnants (rests of Serres)(1), though there is great controversy regarding the possible implication of the enamel epithelium, dental lamina remains, and the rests of Malassez (2-9).

The diagnosis of these lesions is casual, since they are mostly asymptomatic (2-8). Panoramic radiographs usually show a well delimited, oval or tear-shaped radiolucency located between the roots of vital teeth (3,7). In our series all the patients were asymptomatic, with the sole exception of the case of relapse, in which the patient reported slight pain in response to palpation of the affected zone.

The differential diagnosis of LPC (1,9,15,18) must be established with the rest of odontogenic cysts - including follicular, primordial and adult gingival lesions in the case of developmental cysts, and radicular and residual cysts in the case of inflammatory cystic lesions.

Thus, follicular or dentigerous cysts are always associated to an impacted tooth (particularly a lower third molar), while primordial cysts are mostly located in the ascending mandibular ramus.

Adult gingival cysts present the same histogenesis, location and clinical features as LPCs, though the rests of odontogenic epithelium appear in the soft tissues – not in bone as in the case of LPCs. As a result, there are no radiological findings (8).

In most cases the differential diagnosis must be established with radicular cysts, in view of their high frequency. These lesions are characterized by necrosis of the affected tooth, as a result of which vitality testing proves negative. It is important to point out that since LPCs are developmental

cysts, the related teeth remain vital. Consequently, and in contrast to radicular cysts, root canal treatment is not indicated (16).

The treatment of choice according to all authors (2,9) is surgical enucleation of the cyst. In our series all the patients were treated in this way, and the diagnosis was confirmed by histological evaluation of the lesion. Such evaluation is essential, since it is the only way to discard a malignant process.

We recorded a single case of relapse 7 years after the removal of the lesion. This low incidence coincides with the observations of other authors (5,7). It has been reported that relapse may be favored by the presence of keratin in the epithelium (keratocyst), or by the presence of a multilocular variant of the lesion. In any case, the main cause of relapse is considered to be failure to fully remove the initial lesion (12). Since in our case the initial sample contained no keratin, we believe incomplete enucleation to have been the cause of relapse (Figure 1B).

A histological study is essential in order to confirm the diagnosis. There have been reports of lesions clinically diagnosed as corresponding to developmental cysts, but which were found to be malignant lesions in the histological study. An example of this is the case published by Svirsky et al., corresponding to a lesion initially assumed to be a lateral periodontal cyst (or globulomaxillary cyst according to the 1978 classification of the WHO), but which was found to be a metastatic carcinoma in the biopsy study (19). This illustrates the importance of histological evaluation.

In conclusion, LPCs are preferentially located in the premolar region of the mandible, and between the upper lateral incisor and canine. One of the features of greatest importance in the differential diagnosis is the fact that the associated teeth are vital. The treatment of choice is surgical removal and posterior histological evaluation to confirm the diagnosis. Relapses are infrequent.

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