

## Case Report Article

# Decompression and enucleation of a large dentigerous cyst in the mandible angle – a case report

Eugênio Esteves Costa<sup>1</sup>  
Paola Corso<sup>1</sup>  
Luciana Lyra<sup>1</sup>  
Gleisse Wantowski<sup>1</sup>  
Suyany Gabriely Weiss<sup>1</sup>  
Carmen Lucia Mueller Storrer<sup>1</sup>

### Corresponding author:

Carmen Lucia Mueller Storrer  
Av. Professor Pedro Viriato Parigot de Souza, 5300 – Campo Comprido  
CEP 81280-330 – Curitiba – PR – Brasil  
E-mail: Carmen.storrer@up.edu.br

<sup>1</sup> Department of Dentistry, School of Health Sciences, Positivo University – Curitiba – PR – Brazil.

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## Abstract

**Introduction:** Dentigerous cyst is the most prevalent lesion of odontogenic origin, commonly radiographically diagnosed, between the second and fourth decades of life, with a predilection for the male sex. The treatment of choice is enucleation; however, decompression is indicated for cysts that reach large proportions. The most frequent complications are expansion and resorption of the bone cortex, facial asymmetry, root resorption of adjacent teeth, migration or delay of dental eruption and compression of the lower alveolar nerve canal. **Objective:** To report a clinical case of a dentigerous cyst adjacent to an impacted mandibular third molar, treated with decompression and enucleation. **Case report:** A 39-year-old male, attended the Stomatology service with a history of a radiographic finding in the mandible. At the radiographic evaluation, it was possible to observe a radiolucent unilocular cystic tumor lesion, well delimited by a radiopaque, asymptomatic, intraosseous image in the region of the mandible right angle, extending from the left first pre molar to the left third molar, with the later included in a mesioangular position. The patient underwent a previous cystic decompression process, followed up regularly for 6 months, and referred for endodontic treatment of the left first and second molars to prepare for surgical

enucleation and removal of the third molar. After removal, the material was sent to anatomopathological analysis, and the results confirmed the diagnosis of dentigerous cyst. The patient is being followed up without postoperative comorbidities. **Conclusion:** The chosen treatment allowed the maintenance of the teeth involved in the lesion, and mainly, the minimization of the enucleation procedure by previous decompression.

## Introduction

Dentigerous cyst is classified as a developmental odontogenic cyst [10, 18], with its prevalence is around 25% to 36% among the cysts found in the jaws [3, 10], affecting mainly men and Caucasians in the second decade of life [2, 4, 18]. In general, the posterior mandible is most affected region [13, 15, 18], in which the mandibular third molars have a prevalence rate between 57% and 62%, followed by the canines with a prevalence of approximately 29% [14, 18]. It is a benign lesion, asymptomatic in most cases [4, 13, 18], associated to the odontogenic epithelium of the crown of an unerupted tooth. The etiology of the dentigerous cyst is unknown, but there is a consensus that it originates from the separation of the follicle around the crown, forming a cavity delimited by the reduced enamel epithelium and the tooth enamel and filled with liquid [13, 17]. Often, its diagnosis is made by a radiographic finding associated to an infectious process and histopathological analysis [10, 13, 15].

Commonly, there are no changes in the patient's oral cavity and it is probably why it may go unnoticed in a routine dental evaluation, thus slowly achieving important proportions [18]. Upon radiographic examination, they appear usually as small [4], unilocular lesions [3, 4, 13, 20], with the presence of a well-defined radiopaque halo of a radiolucent-looking lesion associated with the crown of an included tooth [13, 18, 20]. One of the classic features on radiographic examination is the presence of a dental follicle measuring more than three to five millimeters [3], what can be considered a relevant difference between the follicle of a tooth germ and the lesion.

Lesions above 5 mm can cause expansion of the alveolar cortex with erosion, facial asymmetry, root resorption of adjacent teeth, as well as migration or delayed eruption, in addition to paresthesia of the mandibular nerve [10, 13]. Histologically, they are characterized by a thin loose connective tissue, covered by non-keratinized stratified squamous epithelial tissue in two or three layers [13, 18]. The differential diagnosis can be of ameloblastoma, keratocyst and other odontogenic cysts.

The consensus treatment for dentigerous cysts is enucleation with the removal of the involved tooth [4, 10, 13, 18], and the recurrence is small [4]. The treatment is safe and effective when the cyst is found in a small size and without compromising the adjacent structures. In the case of cysts larger than 5 mm, there are some options for treatment modalities, such as: decompression [12], marsupialization [7], marsupialization and orthodontic traction of the included tooth [5], marsupialization with subsequent enucleation [1, 10], enucleation and resection [21].

Marsupialization and decompression are described as different surgical techniques. These approaches aim to decrease the size of the lesions prior to enucleation [8] or completely solve the lesions [16]. In marsupialization technique, a part of the lesion's body is cut and removed, and the lesion's exposed boundaries are sutured to the adjacent mucosa to create a surgical window that exposes the cyst to the oral cavity. The difference in the decompression technique, is that a drain is placed in the lesion, keeping the communication with the cystic cavity [6]. The advantage of both techniques is the preservation of important anatomical structures and the prevention of a consequent possible deformity [22].

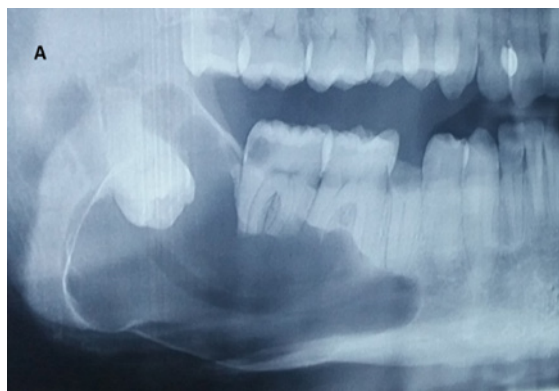
The choice of treatment should be based, in addition to knowledge of the techniques, on the position of the included tooth, on the patient's age, on the size of the lesion, and the involvement of anatomical structures [3, 13].

Thus, the objective of this case is to describe the enucleation of a dentigerous cyst associated to an impacted mandibular third molar after decompression.

## Case report

A 39-year-old, male, with leukoderma, attended the Stomatology service at Universidade Positivo, with a history of radiographic finding in a routine overview with unknown evolution time. At radiographic evaluation it was possible to observe a radiolucent unilocular cystic tumor lesion, well delimited by radiopaque, asymptomatic, intraosseous image in the region of the mandible right angle, extending

from the left first pre molar to the left third molar, with the later included in a mesioangular position and involving the crown (figure 1). After a thorough anamnesis, the patient did not report use of any medication or the presence of other comorbidities.



**Figure 1** - Inicial panoramic radiography. Radiolucent lesion in the region of the mandible right angle, extending from the left first premolar to the left third molar

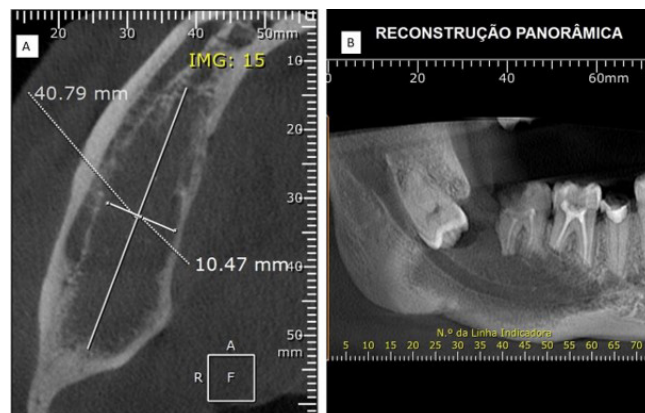
Thus, the incisional biopsy was performed. During the procedure, it was observed keratinous drainage and an unpleasant odor, which could suggest the presence of other types of injury. However, the initial diagnostic hypothesis from clinical and histopathological combined analysis was dentigerous cyst. At the same time, due to the lesion's benign characteristics, a latex drain was installed in the vestibular region of the left mandibular second molar.

A keratinous drainage with an unpleasant odor was observed through the latex drain, already installed, in the buccal and posterior region of the mandibular second molar. The patient was instructed to clean the cavity through the drain with 0.12% chlorhexidine vigorously 3 times a day. After one month, there was persistent local odor, although the radiographic aspect was better in a short time. The patient was medicated with amoxicillin 500 mg every 8 hours for 14 days, nimesulide 100 mg every 12 hours for 3 days and acetamonifen 750 mg every 6 hours for 5 days.

At radiographic evaluation, the root apexes of the mandibulars left first and second molars and extensive tooth cavity in the second molar were also observed, and the patient was referred to the endodontic treatment of the elements involved in the injury, prior to surgical enucleation.

A cone beam computed tomography was also performed and the presence of a suggestive image of bone cyst related to the third molar was observed, as already known, with extension up to the first pre molar, measuring 40 x 10 mm. Longitudinal

root resorption of the first and second molars was also confirmed, with endodontic treatment already performed, and its location was close to with the mandibular canal (figure 2).



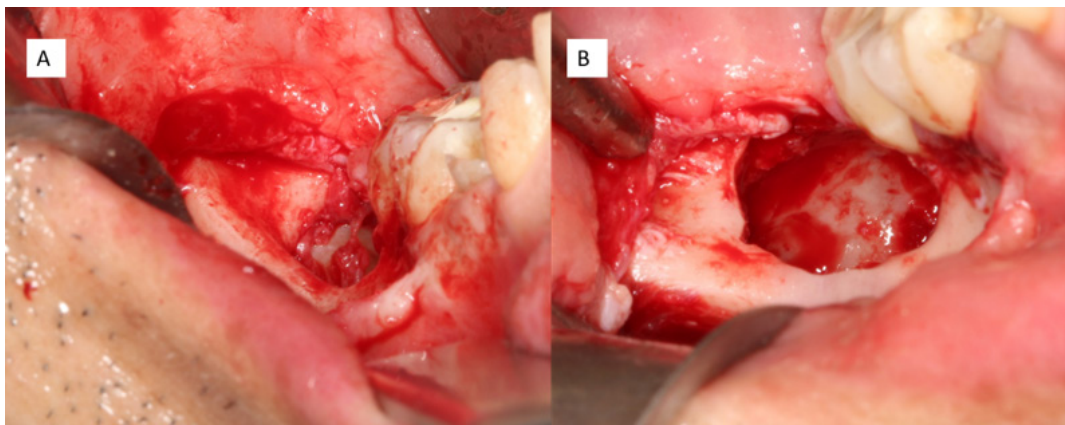
**Figure 2** - Initial cone beam computed tomography. A) Tomographic measurements in cystic region; B) Sagittal tomographic section suggesting horizontal resorption at the roots of adjacent teeth

A panoramic control radiograph was performed at 6 months of follow-up (figure 3) and then, it was opted for the total removal of the cyst and the impacted third molar under general anesthesia. Preoperative blood tests and electrocardiogram were requested, and pre-anesthetic consultation was performed.



**Figure 3** - Radiography of six months of follow-up after decompression, before cyst enucleation

In the surgical procedure, after nasotracheal intubation, an occlusal incision was made in the right retro molar triangle with vestibular extension and a vertical incision in the region of the first molar. Pre-existing bone cavity was increased as peripheral osteotomy, curettage, and cystic capsule removal. The impacted third molar extraction with osteotomy was also performed and the cavity was properly prepared with filing, irrigation, and hemostasis (figure 4).

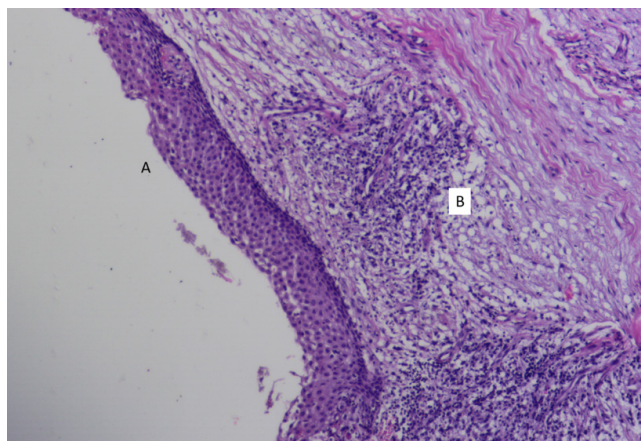


**Figure 4** - A) Extraction and enucleation for cyst access; B) Cyst cavity after tooth extraction and preparation

The cystic material removed during the procedure was referred for histopathological examination as an excisional biopsy. The patient was medicated with amoxicillin 500 mg every 8 hours for 7 days, nimesulide 100 mg every 12 hours for 3 days and acetaminofen 750 mg every 6 hours for 5 days.

#### Histological findings

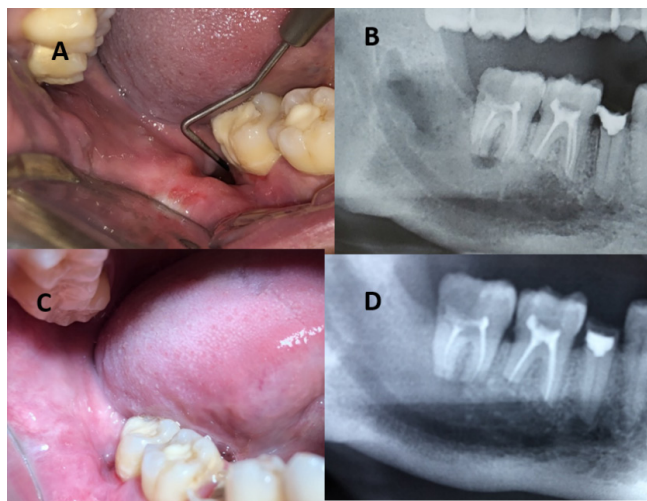
The cystic material was fixed in formalin, and stained using the Hematoxylin and Eosin method. The histopathological report was compatible with the previous one, confirming the diagnosis of dentigerous cyst. The squamous epithelium, with erosion and mononuclear infiltrate, with a predominant area of neutrophils were described (figure 5).



**Figure 5** - Histopathological section showing stratified epithelium (A) and connective tissue with diffuse chronic inflammatory infiltrate (B)

The patient returned seven days after surgery. He did not present any significant complaints, just a slight discomfort compatible with the surgical procedure. The patient reported that there was no change in sensation in the lip and tongue, with mouth opening within normal standards.

In the sixty-day postoperative period, the patient presented a bone defect totally covered by mucosa, without clinical signs of bleeding, inflammatory process or purulent secretion (figure 6 - A and B). In the 180-day postoperative control, the patient came to the service with the restoration of the gingival anatomy of the region of the retromolar trigone and with a radiographic image suggestive of bone recovery from the place where the tooth was extracted and the cyst was removed. The patient has regularly attended scheduled appointments, and has been in postoperative follow-up for over a year.



**Figure 6** - A and B) Bone defect in the region of the retromolar trigone in the immediate 60-day postoperative period; C and D) Image showing bone recovery and closure of the defect in the region

## Discussion

The dentigerous cyst is the second most recurrent cyst in the jaws [15, 21], and the most prevalent odontogenic cyst [3, 15]. The etiology of this cyst is still not a consensus [11]. In most cases, they are asymptomatic lesions, and commonly found in routine radiographic evaluations [10]. They usually appear as a radiolucent, unilocular and well-defined lesion, most found in the posterior mandible region [15, 18], usually associated to impacted third molars [2, 4, 19]. The second highest prevalence is the anterior maxilla, associated to impacted canines or supernumerary teeth [14, 18].

The most affected age range of involvement by the dentigerous cyst is wide, between the second and fourth decades of life [4, 10, 18], with an average age of 21 years [9]. There is a predilection for Caucasians [4], with a 2: 1 prevalence ratio for males [4, 18]. Although some studies claim that there is no statistically significant difference in the predilection for sex [14, 15]. The present case agrees with the literature data, since it was a routine radiographic finding in a male caucasian patient, in the fourth decade of his life. The lesion presented as a radiolucent, unicystic image, associated to the non-erupted mandibular third molar.

Biopsy and histopathological exams are essential to confirm dentigerous cyst [3, 4] since the other characteristics are similar to other cystic lesions [13]. Histologically, the cystic capsule presents a fibrous connective tissue covered by stratified parakeratinized squamous epithelium with a thickness of two to four layers of cubic epithelial cells, with an increase in the thickness of the epithelium associated with inflammation [9, 13]. In this case, the histopathological report described a squamous epithelium infiltrated by neutrophils, that demonstrates the inflammation of the cyst, which goes against the findings of Fernandes *et al.* [9], whose work refers to the diffuse or localized inflammatory infiltrate in 46.6 % of cases.

As for the size of the lesion, the vast majority does not exceed 4 cm in diameter [4]. Larger cysts associated with mandibular third molars can cause cortical bulging, weakening of the mandibular angle and neurological injury [3, 5, 13]. In the presented clinical case, the lesion is described with more than 4 cm in its longest axis, even after decompression, and can be classified as a large lesion.

The treatment of choice for dentigerous cyst is enucleation [10, 18]. However, the decision of adequate therapy must be based on specific knowledge, in addition to the age, size of the lesion and clinical importance of the involved

teeth [3, 8]. Enucleation of large lesions adjacent to impacted third molars can cause injuries to the mandibular nerve or bone fractures [5]. Therefore, marsupialization or decompression prior to enucleation [2, 7, 8, 13] is indicated for larger lesions, as performed in the clinical case described.

Decompression is a surgical procedure that opens the cystic capsule, so that the internal content of the cyst is drained, and the internal pressure decreases [2], thus reducing its size [1]. In the present case report, a drain made with latex from the surgical glove itself was used, offering sufficient condition for the patient to be able to clean the internal part of the cavity.

Caliento *et al.* [3] also used cyst decompression by marsupialization, following the evolution of the case for six months with clinical examinations and panoramic radiographs until the lesion reduction allowed an extraction of the dental element and safely enucleation of the lesion. The differential of the clinical case presented here was the option for the surgical procedure in a hospital environment under general anesthesia, due to the unfavorable position of the affected tooth, even after this period. Gendviliene *et al.* [10] did not describe how the enucleation procedure was performed, but they performed a follow-up time, between marsupialization and enucleation of the cyst, greater than six months. The authors described the involvement of the first and second molars in the lesion, as in the case presented, but choose not to perform endodontic treatment, claiming their vitality in a one-year follow-up after the cyst enucleation.

Aoki *et al.* [2] described the aid of orthodontic traction after the marsupialization procedure, as well as Celebi *et al.* [5], to assist the eruption of the affected tooth and reduce the size of the cyst, since it is associated with the crown dental. Aoki *et al.* [2] described not having performed the extraction of the affected tooth, and Celebi *et al.* [5] extracted the tooth with cyst enucleation four months after the beginning of orthodontic traction. In our case, the size of the cavity decreased enough to reduce the risk of injury to the nervous plexus and mandibular fracture. The decision on when to perform the enucleation procedure after marsupialization is visual [10] during the evaluation of radiographic or tomographic images.

Cleaning through the drainage and the decompression orifice performed by the patient, also proved to be an important factor in the evolution of the cystic decompression process, and this must be rigorous and vigorous as indicated by Caliento *et al.* [3]. Initially, the patient was instructed to perform this cleaning with saline solution [3,

7] but due to apparent contamination, 0.12% chlorhexidine mouthwash was added to sanitization as indicated by Allais *et al.* [1]. Gendviliene *et al.* [10] and Ghandour *et al.* [11] indicate the creation of a protective device so that the cavity does not accumulate residues during feeding, which could have helped right after marsupialization in the evolution of the case. Gendviliene *et al.* [10] state that decompression and reduction of the size of the lesion to a size considered safe enough for enucleation can take several months, perfectly confirmed in this study, in which more than six months were waited for surgical enucleation.

In this case, a slight regression of the lesion can be observed after the decompression procedure, allowing immediate satisfactory clinical results in the enucleation and extraction procedures.

## Conclusion

This case report reinforces the possibility of maintaining the teeth involved in the dentigerous cyst lesion, and mainly, the minimization of the cystic enucleation procedure by marsupialization.

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