

Conservative treatment of the dentigerous cyst: report of two cases

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Abstract

The purpose of this paper is to present two cases of dentigerous cyst associated to permanent teeth in children treated by conservative techniques. Dentigerous cyst is the most common developmental cysts of the jaws. Conservative treatment is very effective to this entity and aims at eliminating the cystic tissue and preserving the permanent tooth involved in the pathology. Two techniques are described as conservative treatment for these cysts, marsupialization and the decompression. Two children presented with dentigerous cysts. A female child was affected by a large lesion at the right side of the mandible associated to tooth 45. The other lesion arose at the left maxilla associated to tooth 21 of a male child. Each dentigerous cyst promoted severe tooth displacement. The first patient was treated with decompression and the second with marsupialization.

Keywords: dentigerous cyst, marsupialization, decompression, conservative treatment.

Introduction

Dentigerous cyst is the most common odontogenic development cyst. It can involve any included tooth, although molars and canines are the most affected ones. Cystic formation involving the crown of premolars and incisors is rare¹.

The classic treatment for dentigerous cysts is enucleation and extraction of the involved tooth. In large cysts, an initial marsupialization can reduce the size of the bone defect before definitive enucleation². Since this cyst has a large prevalence in children, marsupialization can be advisable as definitive treatment to allow the eruption of the permanent tooth involved. Children have a great regenerative potential and tooth with incomplete root development maintain the eruptive strength³. In such circumstances, therefore, marsupialization or decompression should be tried as a major therapy^{1,4}.

The aim of this article is to present the cases of two children who presented large dentigerous cyst associated to teeth where the incidence of this lesion is not so common. Each cyst was treated by different surgical techniques, marsupialization and decompression. These children had their permanent teeth erupted and they were functional in the dental arch in just six months. This paper also illustrates how these easy therapies are considered important and conservative modalities to approach this pathology.

Received for publication: November 08, 2012

Accepted: February 11, 2013

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Clinical Cases

This work was conducted in accordance with bioethical concerns. Written informed consents were obtained from the children's parents for all imaging exams, for the treatment modality adopted, and for the publication of the data presented in this paper.

Two patients, a boy aged 7 years and a girl aged 11 years, were referred to the Oral Surgery Clinic of the Oral and Maxillofacial Surgery Master's Program of the Catholic University of Rio Grande do Sul, Brazil. They were accompanied by their respective parents who complained about facial asymmetry and delay of permanent tooth eruption in both children. No history of systemic pathologies or previous trauma in the affected area were reported.

The boy presented an important facial asymmetry with expansion of paranasal region and upper lip on the left side that caused elevation of the nasal wing. Intraoral exam revealed compressible and painless expansion of buccal and palatal cortical plates of the alveolar ridge at the region of teeth 61, 62, 63 (Figure 1). Dentition was mixed, free from carious lesions and no permanent maxillary incisors were present in the arch. There was no sensorial or motor deficit at the facial structures.

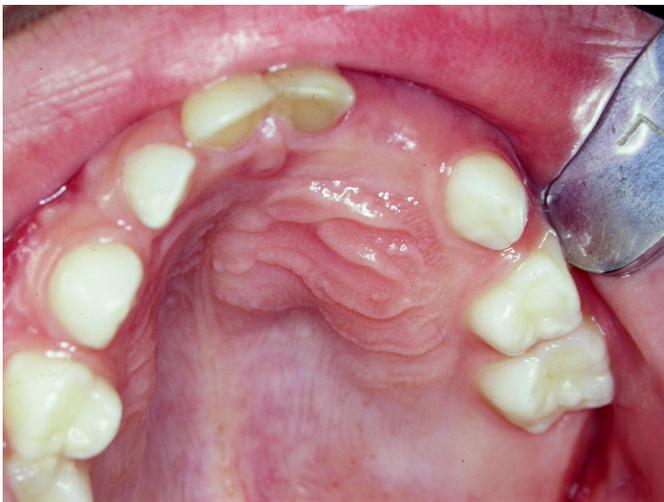


Fig. 1. Clinical features of the patient with a maxillary dentigerous cyst. Alveolar ridge expansion at the palate.

The girl presented a discreet expansion at the right side of the mandibular body resulting in a mild facial asymmetry. Bone expansion of the buccal cortical plate of the alveolar ridge caused deletion of the buccal folder (Figure 2). Dentition was also mixed, free from carious lesions and the eruption of teeth 44 and 45 was delayed. There was no complaint of dysesthesia in the face.

In both cases, the radiographic findings revealed a well-delimited radiolucent area, measuring approximately 20 mm in its largest diameter, with sclerotic margins, completely associated with the crown of the involved permanent teeth, all in Nolla's stage 8 of tooth development. In the first patient, tooth 21 was within of the radiolucent image that was also



Fig. 2. Clinical features of the patient with a mandibular dentigerous cyst. Buccal fold expansion due to the lesion.

impacting tooth 22 (Figure 3). The other patient had tooth 45 involved with the radiolucent lesion, and tooth 44 was slightly impacted by the radiolucid area (Figure 4).

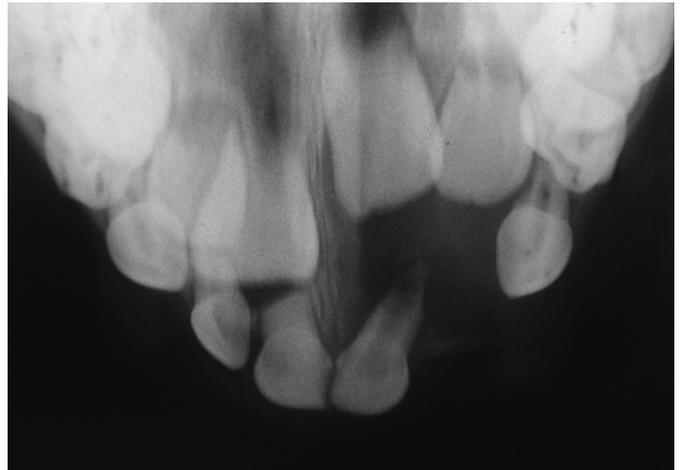


Fig. 3. Occlusal radiograph before marsupialization of the maxillary cyst showing displacement of teeth 21 and 22.

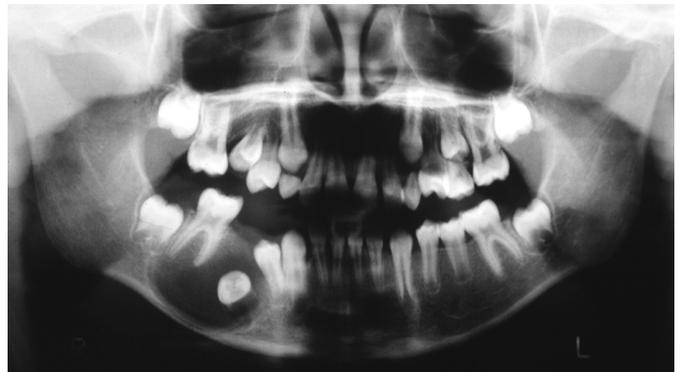


Fig. 4. Panoramic radiograph before decompression of the mandibular cyst exhibiting the radiolucent area around tooth 45.

Aspiration of the lesion fluid revealed, in both cases, a serous and bloody liquid content. The clinical diagnosis of

dentigerous cyst was concluded allowing the beginning of an initial treatment with marsupialization in the case of the cyst that involved the maxillary teeth (Figure 5). The lesion at the girl's jaw was treated by decompression (Figure 6). During the surgical procedures a biopsy was made and the histopathological examination confirmed the clinical diagnosis of the dentigerous cyst for the lesions of both patients (Figure 7 A and B).

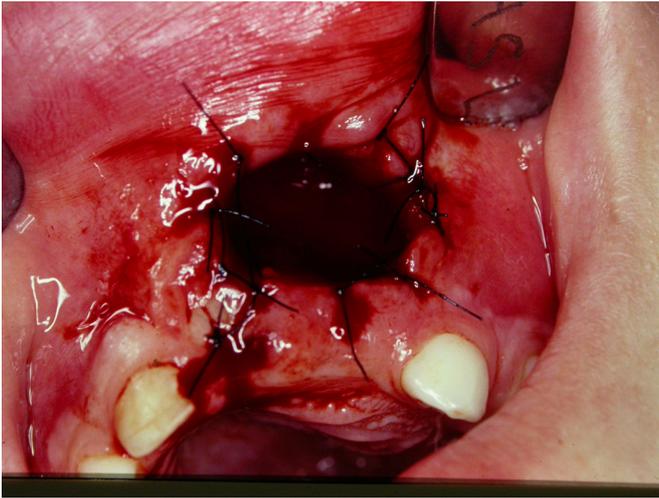


Fig. 5. Clinical aspect immediately after marsupialization of the maxillary cyst, with open cavity.

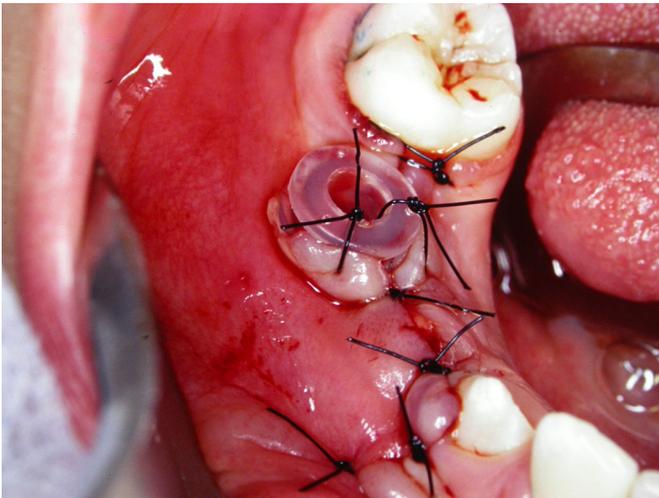


Fig. 6. Clinical aspect immediately after decompression of the mandibular cyst, showing a plastic device made of anesthetic cartridges inserted in the cystic cavity.

The follow-up was accomplished at 7, 30, 60, 120 and 180 days. In both patients, a progressive improvement was observed in the facial asymmetry. Radiographic decrease of the lesion diameter and the eruption of the involved teeth were achieved already in the first 2 months. At 6 months, all teeth had erupted in both cases.

The boy's maxillary left central incisor erupted with a discrete rotation and the left lateral incisor was in the course of eruption (Figure 8). In the girl, the two premolars, previously impacted by the cyst, were present in mouth (Figure 9). There was no evidence of pathological

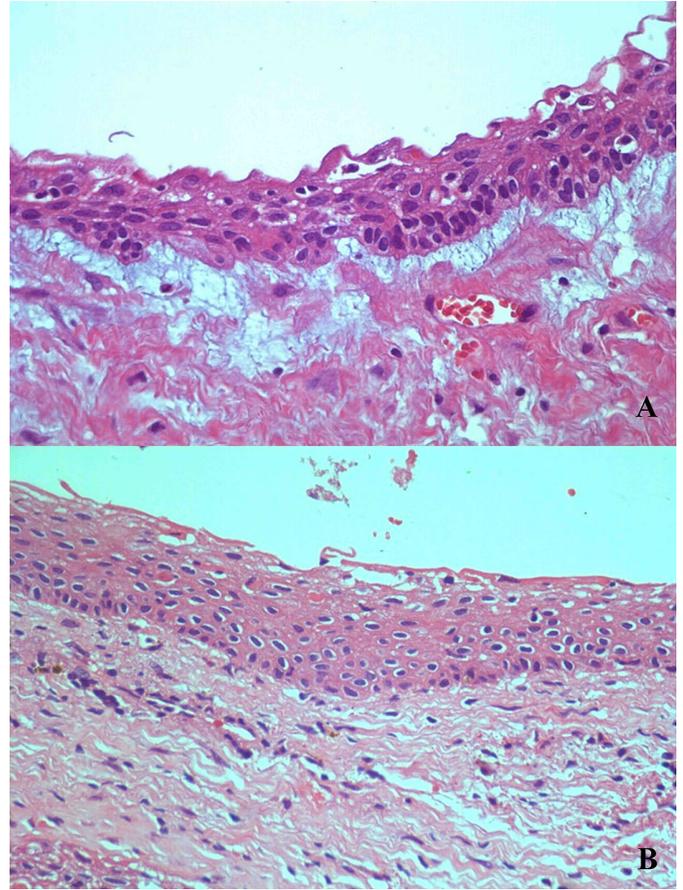


Fig. 7. Photomicrographs of the cysts. A) Hystological feature of the maxillary dentigerous cyst, showing nonkeratinized squamous epithelium. B) Hystological feature of the mandibular dentigerous cyst, showing nonkeratinized squamous epithelium. HE, 400X.

radiolucency in both cases (Figures 10 and 11). There were no differences between the two cases with respect to the eruption rate of the involved teeth nor in the velocity of involution of the radiographic radiolucency.

It is important to emphasize that no orthodontic appliance was necessary to assist the eruptive process. After two years of clinical and radiographic follow-up, there were no signs of recurrence of the lesion.



Fig. 8. Posttreatment clinical aspect of the boy. Tooth 21 erupted in mouth.



Fig. 9. Posttreatment clinical aspect of the girl. Tooth 45 in occlusion.



Fig. 10. Posttreatment occlusal radiograph.

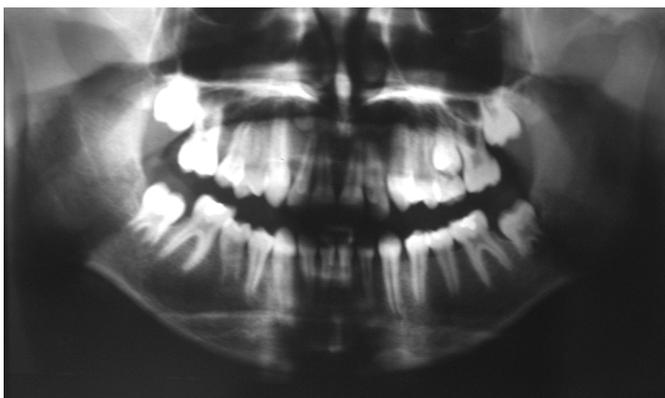


Fig. 11. Posttreatment panoramic radiograph.

Discussion

The genesis of the dentigerous cysts has been discussed by Benn and Altini⁵, who proposed two different processes for cystic degeneration of the reduced epithelium of enamel organ of an included tooth. The first phenomenon is usually

associated to the compression promoted by tooth eruption at the pericorony follicle, which induces fluid accumulation between this tissue and tooth crown.

The second mechanism is associated to an apical inflammation in the primary predecessor whose cytokines stimulates cystic degeneration of the permanent tooth follicle. In these cases, the lesion would be early discovered at the second decade of life during routine radiographic examinations or even later due to pain and facial swelling⁵. Both cases described at this paper were probably associated to cystic degeneration of the permanent teeth follicle since no relationship with inflammatory processes caused by caries in the primary dentition could be confirmed once both children had healthy teeth.

Dentigerous cyst shares clinical and radiographic features with other lesions such as odontogenic keratocyst, ameloblastoma, ameloblastic fibroma and adenomatoid odontogenic tumor⁵, which can simultaneously occur with this cyst⁶⁻⁸. Its epithelium can suffer metaplasia into an odontogenic tumor and also into malign lesions⁷. For this reasons, biopsy is a fundamental diagnostic element. The conservative techniques to both patients adopted allowed obtaining parts of the lesion in the same surgical procedure. Since the clinical diagnosis was confirmed, no other intervention, than follow up, was necessary.

Some different surgical therapeutic modalities have been applied to treat dentigerous cysts. Among them, the conservative option is very important in cases of large lesions and when the permanent teeth involved have eruptive potential⁸. One possibility is the insertion of a device in cystic lumen in order to keep patent the communication between the interior of the cyst and the mouth. This procedure characterizes the decompression and differs from marsupialization because this technique involves the biopsy of large fragments of tissue⁹.

Factors such as angulation and position of the tooth associated to the cyst, as well as the degree of root formation are important requirements for tooth eruption. The size of the lesion has no influence at eruption. As soon as cyst regression begins, the involved tooth erupts in the most convenient position depending on its relationship with the neighboring structures¹⁰.

The main advantages of marsupialization or decompression for the treatment of dentigerous cyst are the stimulus for bone formation after the decrease of cystic pressure. The communication with oral secretions increases the inflammatory process and both macrophages and lymphocytes from inflammation release growth factors that enhance bone formation¹¹⁻¹³. Preservation of the involved teeth is also another relevant feature of those modalities¹³.

The largest disadvantage of the conservative treatment is the preservation of pathological tissue inside the jaws without histological examination¹³. The lack of patient's cooperation in cleaning the pathological cavity and the need for periodic follow-up visits also represent additional disadvantages.

The period of 3 months after marsupialization is suggested as the critical time to decide for an additional

treatment to stimulate tooth eruption if it did not occur after cyst regression. After this period, the surgeon should decide between tooth extraction and orthodontic traction¹⁰. Other authors share this opinion and also suggest that after 3 months the size of the cyst decreases and tooth eruption can already be confirmed radiographically¹³.

The patients reported in this paper were treated only with decompression or marsupialization. Both presented cysts with expressive dimensions and two permanent teeth were affected by the lesion. Since children and their respective parents were very cooperative, the therapeutic option was curative.

Treatment of dentigerous cyst through conservative therapy is preferable in children. Marsupialization and decompression may represent the treatment of choice, but they are also useful prior to extensive enucleation or curettage. Inherent peculiarities to the dentigerous cyst regarding size and location, linked to root development and dental positioning, as well as patient's profile should be strongly considered for a safe and effective treatment. Marsupialization and decompression are very low invasive techniques that could easily be conducted by any dentist familiar with basic surgical procedures, in order to treat the pathology and preserve the tooth or teeth involved with the cyst.

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