Spontaneous eruption of a canine after marsupialization of an infected dentigerous cyst

Soraya de Azambuja Berti,a Adriane Bastos Pompermayer,a Paulo Henrique Couto Souza,b Orlando Motohiro Tanaka,c Vânia Portela Ditzel Westphalen,d and Fernando Henrique Westphalen,e Curitiba, Parana, Brazil

A dentigerous cyst is the most common developmental odontogenic cyst. It is a benign and asymptomatic intraosseous lesion that affects the bones of the maxillofacial complex, interfering with tooth eruption. This article reports the spontaneous eruption of a canine after marsupialization of an infected dentigerous cyst and extraction of the deciduous teeth. A radiograph showed a large cyst with a radiolucent area involving the mandibular left deciduous canine and first molar, and the permanent canine and first premolar. Although enucleation is the treatment of choice, marsupialization is the best option for large cysts involving an unerupted permanent tooth, as in this case. The patient was followed for 1 year, and eruption of the permanent canine and first premolar and gradual reduction of the radiolucent area were observed. (Am J Orthod Dentofacial Orthop 2010;137:690-3)

A dentigerous cyst is the most prevalent type of developmental odontogenic cyst. Its origin is in the tooth follicle of an unerupted tooth crown, generally the mandibular third molar, which is attached to the cyst through the cementoenamel junction. Its pathogenesis is unknown, but it can be explained by the accumulation of liquid between the remnants of the reduced enamel epithelium of the tooth-forming organ and the unerupted tooth crown after its complete development.1,2

It is more frequent in the second and third decades of life, with a male predilection,3 and the mandible is the most affected region.4 These cysts can cause cortical bone expansion and consequently facial asymmetry, although usually there are no symptoms.5,6 Dislocation of the teeth near the cyst and root resorption are also observed in some patients.7

The radiographic image of a dentigerous cyst shows a unilocular radiolucent area with well-defined sclerotic margins.1 However, trabecular bone can appear on the radiographic images, creating a false impression of a multilocular lesion, and, once infected, the cyst can show diffuse margins.2

Enucleation and marsupialization are the best options to treat a dentigerous cyst.5,8 The first is the process in which the cyst is completely removed without rupture; this is generally indicated for small cysts. For large lesions, this procedure can cause fracture of the mandible, tooth devitalization, or removal of impacted teeth associated with the lesions that do not need to be removed. Marsupialization consists of a surgical cavity on the wall of the cyst, emptying its content and maintaining the continuity between the cyst and the oral cavity, maxillary sinus, or nasal cavity, but it is not indicated for infected lesions.9 This technique is indicated for large cysts, unerupted teeth associated with cysts in pediatric patients, or in patients with systemic diseases, generally the elderly. It permits decompression of the cyst, reducing the extent of the bone defect.10

The treatment of impacted teeth is a challenge to orthodontists,11 and the treatment of choice is surgical exposure of the tooth and consequent orthodontic traction, which generally causes a cyst cavity reduction and preserves the unerupted tooth.12 Spontaneous eruption, without orthodontic intervention, can occur after the extraction of deciduous teeth and cyst marsupialization.13 It is generally known that there is a close relationship between the ability of a tooth to erupt and the level of dental root formation. A permanent tooth breaks through the alveolar bone and erupts when approximately two thirds of the root has formed and then erupts into the oral cavity at approximately three fourths to complete root formation with a wide-open apex.7,14,15

From the Graduate Dentistry Program, Pontifical Catholic University of Paraná, Curitiba, Brazil.
aPostgraduate student, Department of Stomatology.
bAssistant professor, Department of Stomatology.
cProfessor, Department of Orthodontics.
dProfessor, Department of Endodontics.
eProfessor, Department of Stomatology.
The authors report no commercial, proprietary, or financial interest in the products or companies described in this article.
Reprint requests to: Orlando Motohiro Tanaka, Graduate Dentistry Program, Orthodontics, R. Imaculada Conceição, 1155, Curitiba, PR, Brazil; e-mail, tanaka.0@pucpr.br.
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We present a case report of a patient with an unerupted mandibular left permanent canine and first premolar associated with an infected dentigerous cyst that was treated with marsupialization therapy. We performed the marsupialization technique, considering the possibility of physiologic eruption of permanent teeth associated with the cyst, followed by orthodontic support.

**CASE REPORT**

A healthy 9-year-old boy was referred by his general dentist who suspected a dentigerous cyst associated with a mandibular left deciduous canine and intraosseous premolar. There had been evidence of recent fever episodes and intraoral purulent discharge related to the deciduous canine and first molar; the patient had been treated with antibiotics. Clinical examinations showed extra and intraoral hardened and painless swelling and mobility of the involved teeth (Fig 1, A). The panoramic radiograph showed a large, well-defined radiolucent lesion measuring 3.0 × 4.0 cm associated with the deciduous canine and first premolar, changing the eruption angulation of the permanent canine and premolar by about 15 mm (Fig 1, B and C).

The objectives of this treatment were to reduce the size of lesion with the marsupialization technique, considered less aggressive, and to follow up orthodontically the eruption of the permanent canine and first premolar, establishing a favorable occlusion, with good functional and esthetic results.

Two treatment alternatives were considered, enucleation and marsupialization, which could be used after extraction of the involved deciduous teeth. The first alternative, enucleation, is usually the technique of choice for small lesions because, in larger lesions, enucleation can cause extensive damage to the adjacent teeth and to the teeth involved in the lesion. Marsupialization is the treatment option for extensive lesions, especially in pediatric patients, as in this report.

A local incision was made, showing a small amount of cystic fluid, confirmed by histopathologic examination. The treatment performed was marsupialization of the cyst and extraction of the deciduous canine and first molar (Fig 1, D). The surgical stitches were removed a week after the procedure. Approximately 3 months later, the cystic lesion diminished, and eruption of the permanent canine and first premolar in normal positions was observed (Fig 2).

After 1 year, the radiograph and clinical features showed reduction of the swollen area, spontaneous eruption of the mandibular left canine and first premolar, and aspects of normality after marsupialization of the dentigerous cyst. After this, any orthodontic biomechanics treatment could be used (Fig 3).

**DISCUSSION**

The dentigerous cyst is the most prevalent developmental odontogenic cyst. Even though it has no symptoms, sometimes it can cause maxillary expansion and facial asymmetry, asymptomatic intraoral swelling, and a large radiolucent area with well-defined limits that involve permanent teeth as observed on radiographic examination and can cause their dislocation near the base of the mandible.

Our patient had the clinical and radiographic features of a dentigerous cyst. To investigate the hypothesis, we performed an exploratory puncture that showed purulent contents. It indicated an infection, considering the development time of the cyst, the history of fever episodes, and the intraoral suppuration obtained from anamnesis. The infection of the cyst probably originated in the first deciduous molar, which showed radiopaque material in the crown, suggesting endodontic treatment and possibly a preexisting periapical lesion.

Although enucleation is the preferred treatment for dentigerous cysts, marsupialization is the best option for large cystic lesions in pediatric patients and even elderly patients who usually have systemic diseases, because it can reduce the cyst cavity and preserve the tooth involved with the cyst. Hyomoto et al reported that approximately 72% of subjects evaluated in their research had natural eruption of the impacted teeth in the dentigerous cyst after marsupialization.

Muramaki et al reported a dentigerous cyst in a 12-year-old boy with asymptomatic intraoral swelling. The radiographic examinations showed a large unilocular, well-defined, radiolucent lesion surrounding the mandibular left second premolar crown; it was treated by marsupialization and confirmed by histopathologic examination. Similarly, Ertas and Yavuz presented a case report of a 9-year-old girl with extraoral 1-sided asymptomatic swelling. In the radiographic examination, a large radiolucent lesion was seen involving the mandibular left second deciduous molar to the mandibular right canine, with dislocation of the premolars toward the lower base of the mandible. The treatment of choice was also marsupialization, and the patient had general anesthesia for the procedure because of her age, the size of the lesion, the dislocation of the permanent teeth, and the incomplete jaw development.

Our patient had similar clinical features to those described by Muramaki et al and Ertas and Yavuz. However, a secondary infection hypothetically contraindicates conservative procedures, such as...
The biologic principle of this conservative technique is to permit the complete transformation of the cystic epithelium into oral epithelium through metaplasia. Its indication in secondarily infected lesions is questionable because the probability of aggravating the local infection is higher in these patients. It happens due to the permanency of an open cavity and also the patient’s age, which could make the maintenance of local oral hygiene more difficult.

**Fig 1.** A, Initial clinical aspects showing intraoral swelling on the left side of the mandible; B and C, initial panoramic radiographs show the cystic lesion involving the deciduous canine and first molar, and the permanent canine and first premolar; D, occlusal view after marsupialization of the cyst and extraction of the deciduous canine and first molar.

**Fig 2.** A, The radiograph shows the reduction of the cystic lesion with the eruption of the permanent canine and the first premolar tipped mesially; B, the canine is in a correct eruption pathway, with uprighting of the first premolar; C, occlusal view of the first premolar eruption.

**Fig 3.** A and B, Spontaneous eruption of the mandibular left canine and premolar; C, aspects of normality in an occlusal view 12 months after marsupialization of the dentigerous cyst.
Nevertheless, this technique was chosen in combination with antibiotics, considering the remaining deciduous canine and first molar as infectious spots for the cystic lesion. Since these teeth had high dental mobility, their removal was justified. Therefore, there was the possibility of taking advantage of the dental alveolus as accessory cavities in which marsupialization could be tried after tooth extraction, without submitting the patient to a new surgical procedure. Cyst enucleation was discarded to avoid possible damage such as devitalization and late dental resorption in the adjacent teeth and mainly in the unerupted permanent canine and first premolar. This damage could be caused by the surgical trauma.

The patient and his parents were instructed about the need for effective oral hygiene and cleansing of the accessory cavity after the surgery by mechanical and chemical means, using solutions such as chlorhexidine, to help local bony regeneration.

Delbem et al.\textsuperscript{13} reported on a patient who was successfully treated for a dentigerous cyst primarily by removal of the deciduous teeth followed by marsupialization without orthodontic treatment. In our patient, we observed that the unerupted permanent canine showed mesioversion and the mandibular incisors, distoversion. However, as cited by Delbem et al.\textsuperscript{13}, the permanent canines surprisingly erupted without orthodontic biomechanics or alignment and leveling of the mandibular left canine and first premolar. In contrast to, Jena et al.\textsuperscript{11}, Perez and Morales\textsuperscript{12} have treated small cysts in pediatric patients with surgical exposure and orthodontic traction as the best alternative to preserve the unerupted tooth when this technique is indicated. Furthermore, the most important aspect concerning small or large cystic lesions that involve an unerupted permanent tooth is the need for orthodontic evaluation and control.

**CONCLUSIONS**

This case report shows the necessity for early diagnosis and treatment of impacted teeth associated with a dentigerous cyst. Marsupialization is an effective surgical technique, even for an infected cyst. The patient and especially the parents must understand the importance of good oral hygiene for a successful treatment.

**REFERENCES**