

Conservative Management of a Dentigerous Cyst Associated with Impacted Maxillary Premolar Teeth, a Case Report with a Review of Literatures

Aliakbar Naghavihosseini ^{1*}, Mina Pakkhesal ², Maryam Ghelichli ³, Amir Reza Ahmadinia ⁴

1. Dental Research Center, Department of Orthodontics, Dental School, Golestan University of Medical Sciences, Gorgan, Iran
2. Dental Research Center, Department of Community Oral Health, Dental School, Golestan University of Medical Sciences, Gorgan, Iran
3. Dental Research Center, Department of Oral and Maxillofacial Pathology, Dental School, Golestan University of Medical Sciences, Gorgan, Iran
4. Dental Research Center, Faculty of Dentistry, Department of Periodontics, Golestan University of Medical Sciences, Gorgan, Iran

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*Correspondence:

Aliakbar Naghavihosseini,
Dental Research Center, Department
of Orthodontics, Dental School,
Golestan University of Medical
Sciences, Gorgan, Iran

dr.naghavihosseini@goums.ac.ir



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Abstract

A Dentigerous Cyst (DC) is the most common developmental odontogenic cyst that mostly happens in patients between 10 to 30 years of age. It is usually completely asymptomatic and is discovered on a routine radiographic examination or to evaluate the reason for an erupted tooth. Radiographically, this cyst usually presents a well-defined unilocular radiolucency attached to CEJ of an unerupted tooth which can cause displacement of adjacent tooth or resorption.

This article reports a large infected DC in a 10-year-old male patient related to first and second premolar maxillary teeth, which did not erupt or even change their positions. DC was treated successfully by decompression. After 2 years follow up, there was no evidence of recurrence. In conclusion, marsupialization of cyst with no orthodontic intervention or tooth extraction is a conservative, efficient protocol that stimulates bone healing and promotes the eruption of unerupted teeth even if they are deeply crowded.

Keywords: Dentigerous Cyst [[MeSH](#)]; Tooth, Unerupted [[MeSH](#)]; Case reports [[MeSH](#)]

Highlights

- Marsupialization of cysts can promote teeth eruption and stimulates bone formation.
- The impacted teeth can be erupted and guided without orthodontic traction and no additional treatment.

Introduction

The Dentigerous Cyst (DC), also known as a follicular cyst, is the second most common cyst of the jaws comprising 14–20 percent of all jaw cysts (1). It originates by the incomplete separation of the follicle layer from tooth crown due to liquid accumulation. There is a slight male predilection and in spite of a wide age range of affection, it is discovered frequently in patients between 10 to 30 years of age (2). A DC may occur in association with any unerupted tooth or even odontoma but it is commonly seen in relation to mandibular third molars followed by the maxillary canines and the maxillary third molars (3).

Generally, DC presents clinically as an asymptomatic unilocular radiolucency surrounding the crown of an unerupted tooth attached to its Cementoenamel Junction (CEJ). Most of the times DCs are clinically asymptomatic and are discovered accidentally when radiographs are taken to evaluate a delay in eruption or mal positioned tooth. Usually, the diagnosis of a DC is straightforward (4). However, even a radiographically ‘typical’ DC can be found to be something else, such as a hyperplastic dental follicle, Odontogenic Keratocyst (OKC) or unicystic ameloblastoma or anything else on histological examination (5), about a dental follicle radiographic similarity with a DC, a dental follicle can be ruled out as contrary to DC’s size, it does not exceed 3-4 mm (3).

A DC may cause displacement of adjacent teeth and root resorption, and inhibit tooth eruption. Moreover, we may found some neoplastic

changes in the epithelial cyst lining. Therefore, appropriate treatment is needed as soon as possible (2). The main treatment is the removal of the cyst with the impacted tooth in order to prevent a recurrence. Marsupialization is another choice to preserve the cyst-associated tooth and promote tooth eruption and reduce bone defects, sometimes followed by Orthodontic traction (6). If sufficient space exists Marsupialization may be advisable to allow eruption of a cyst associated impacted or unerupted tooth. There is a close relationship between the amount of root formation and the ability of tooth eruption (7). There is a controversy around predictive indicators for the eruption of a cyst-associated tooth after marsupialization. Some factors that may influence tooth eruption are: whether the patient is older or younger than 10 years old, tooth depth, tooth inclination, incomplete root formation, and an open apex, and sufficient space. In contrast, according to some articles, these factors are insignificant in tooth eruption (8, 9).

This report describes a case of a 10-year-old boy with a large dentigerous cyst associated with impacted left maxillary first and second premolar teeth. The cyst was marsupialized under local anesthesia, and the patient was checked weekly at the beginning, following bi-monthly checkups for two years. The impacted teeth erupted without orthodontic traction and no additional treatment.

Case presentation

A 10-year-old male patient with the chief complaint of the unerupted left maxillary central incisor was referred for orthodontic treatment. On clinical examination, the patient’s overbite and overjet were normal. Radiographic examination revealed a large cystic radiolucency associated with left first and second premolar maxillary teeth, which were unerupted and mispositioned (Figure 1). Intraoral examination with orthopantomography revealed a mixed dentition stage and clinically impacted premolars and there was definite swelling in association with unerupted premolars. Slight extraoral swelling without tenderness in relation to the maxilla on same side was noted.

The patient's overall medical history was good and no associated lymphadenopathy or trauma was present. In our case, there were no clinically evident syndromes.



Figure 1. Radiographic features

A needle aspiration biopsy was performed on the initial visit to understand whether the lesion was solid or cystic. The findings of this examination beside the radiographic analysis suggested that the lesion was a cyst, apparently a dentigerous cyst. In the treatment plan, one clinician suggested surgery and removal of the cyst with the affected teeth. Treatment of dentigerous cysts is often enucleation. However, in order to correct tooth displacement and bone loss marsupialization or decompression is better management. Regarding the patient age, teeth angulation, and available space after space analyzing, the natural eruption of these teeth was assumed to be possible in the treatment planning, and we decided non-surgical orthodontic treatment only by creating a pore in the cyst wall and marsupialization. Through a buccal mucoperiosteal flap, the cyst membrane was fenestrated. A specimen was sent for microscopic examination.

Histopathologic examination revealed a pathologic cavity lined by flattened odontogenic cells, supported by a fibrous wall, with a variable infiltration of inflammatory cells that changed the histopathologic appearance in some parts. Epithelial lining showed hyperplasia and development of rete ridges and focal areas of mucous cells with the diagnosis of an inflamed dentigerous cyst ([Figure 2](#)).

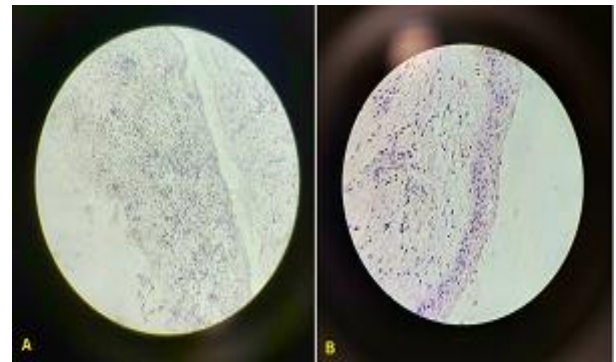


Figure 2. Histologic features

The cyst membrane was sutured to the oral mucosa to create a window. Then, a gauze soaked with iodoform was inserted into the cyst cavity to keep it open. The packing was replaced biweekly. The patient was examined radiographically bimonthly ([Figure 3A](#)). It was observed on the radiographs that the impacted teeth slowly moved toward the alveolar crest without any orthodontic traction. After 3 months, the teeth were erupting slowly ([Figure 3B](#)). After 6 months, the first premolar rapidly reached near alveolar mucosa and the second premolar teeth reached halfway to the desired position ([Figure 3C](#)). After 11 months, the teeth reached the alveolar mucosa ([Figure 3D](#)), and after 16 months, all teeth erupted without orthodontic traction ([Figure 3E](#)). We have followed the patient for 24 months ([Figure 3F](#)); during this period, the cyst had shrunk completely and there has been no recurrence of the cyst.

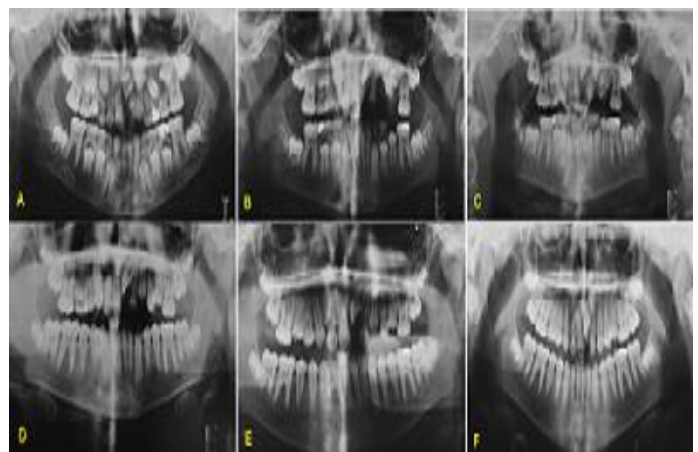


Figure 3. Follow-up of treatment sequences

Discussion

Dentigerous cysts are always associated with an embedded or unerupted tooth (10-14). There are 2 types of dentigerous cysts that may be occurred. The first type is developmental in origin and occurs in mature teeth usually as a result of impaction and water accumulation under the dental follicle. These cysts usually occur in the late second and third decades, are revealed on routine radiographs, and mainly involve mandibular third molars (15). The second type is inflammatory in origin and occurs in immature teeth as a result of inflammation from a nonvital deciduous tooth. These are diagnosed in the first and early part of the second decade either on routine radiographic examination or when the patient complains of swelling and pain (16). Regarding the age, clinical behavior, and histopathologic characteristics, we consider this case might be classified as the second type of dentigerous cyst. Treatment of dentigerous cysts is often surgery and enucleation. However, cysts causing tooth displacement and bone loss can be treated with marsupialization or decompression (17). In this method, new bone formation is stimulated because marsupialization decreases the intracystic pressure. The major disadvantage of marsupialization is that pathologic tissue is left in situ, without a thorough histologic examination (3, 13). However, the tissue taken in the window can be deferred to pathologic examination, and there is a possibility of a more aggressive lesion in the residual tissue (18).

It is known that although a dentigerous cyst inhibits eruption of the cyst-associated permanent tooth, maturation of tooth roots continues (12).

Buyukkurt et al reported that an impacted tooth is able to erupt more rapidly if marsupialization is performed at a time when the tooth has the ability to erupt. There is a close correlation between eruption and the development of teeth roots (11, 12). Speed of eruption and rate of angulation of the cyst-involved permanent teeth were faster than those of the teeth on non-cystic side (8). A permanent tooth goes through the alveolar bone when nearly two-third of the root has formed and

continues the eruption till the time apex is open. But about a tooth associated with a dentigerous cyst, this might not be the same (3).

Hyomoto et al. reported that marsupialization is useful for promoting eruption of teeth associated with dentigerous cysts (11). Orthodontic traction of impacted teeth with matured root has often been performed after marsupialization of a large cyst (12, 20, 21). Many cases have reported good results in preserving cyst-associated teeth after marsupialization without orthodontic traction (7, 8, 13, 14, 18, 19).

According to Motamedi and Talesh (1), the choice of the therapeutic approach should be based on the size and location of the cyst, patient age, affected dentition, and relationship with surrounding vital structures. In an attempt to preserve the tooth associated with the cystic lesion, the marsupialization technique has been successfully performed and is indicated for growing children and adolescents. This conservative procedure leads to reduction in the size of the cystic cavity and allows the spontaneous eruption of the unerupted/ impacted tooth. If no treatment is performed, the cyst not only precludes the normal eruption of the affected tooth but also might cause ectopic tooth positioning, bone expansion, and facial asymmetry. In this case marsupialization was the treatment of choice because the patient in question was a young child and the lesion occupied a large maxillary area. The treatment protocol was similar to that described in several previous reports (1, 6, 21, 22).

In our case, all teeth erupted with only marsupialization without orthodontic traction. The treatment was quite simple, safe, and atraumatic.

Although marsupialization has some disadvantages, we treated our case with only marsupialization because the patient was very young and also the cyst was very large, the cyst had led to the displacement of first and second permanent premolars teeth, and maxillary development had not been completed. We believe that the eruption of teeth is dependent on space available, the early age of the patient, and

incomplete open apex root formation. The successful outcomes reached after 24 months of follow up show that, with proper case selection, marsupialization might be a good treatment option for conservative management of dentigerous cysts.

Conclusion

A successful conservative treatment for dentigerous cysts is marsupialization and decompression of the cystic cavity which promotes teeth eruption and stimulates bone formation. As the epithelium of this cyst has multipotential nature, the patient must be followed up until the complete teeth eruption and bone consolidation. Correct diagnosis could manage and prevent radical treatment of dentigerous cyst with guidance of unerupted teeth to proper occlusion.

Conflicts of interest

There is no conflicts of interest.

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