

CONSERVATIVE APPROACH TO A LARGE DENTIGEROUS CYST IN AN 11-YEAR-OLD PATIENT

11 Yaşındaki Hastada Büyük Bir Dentigeröz Kistin Konservatif Yaklaşımla Tedavisi

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ABSTRACT

Dentigerous cysts are form of benevolent odontogenic cysts which are related to crowns of permanent teeth. Often, they are described as unilocular radiolucent lesions and barely seen in childhood era. This article aims to show a case about 11 year old boy having a dentigerous cyst associated with the mandibular canine and a premolar. Extraction of the primary molars and marsupialization of the lesion is also included in this method of treatment. After 9 months of the treatment, impacted teeth spontaneously erupted. Therefore, if we aim to manage of dentigerous cysts in children conservatively, marsupialization might be considered as first and foremost treatment method.

Keywords: Dentigerous cyst; marsupialization; tooth eruption; tube drain; oral surgery

ÖZ

Dentigeröz kistler daimi dişlerin krunlarını içine alan iyi huylu odontojenik kistlerdir. çocukluk döneminde seyrek olarak saptanırlar ve radyografik görüntüleri ünilocüler lezyon görünümündedir. Bu makalenin amacı 11 yaşında erkek çocukta mandibular kanin ve premolar dişleri etkileyen dentigeröz kist olgusunu bildirmektir. Tedavide süt molar dişin çekimi ve dentigeröz kistin marsupializasyonu yapılmıştır. 9 aylık takip sonrasında gömük mandibular kanin ve molar dişin kendiliğinden sürdüğü gözlemlenmiştir. Çocuklarda marsupializasyon dentigeröz kistlerin konservatif tedavisinde ilk seçenek olarak düşünülmelidir.

Anahtar kelimeler: Dentigeröz kist; marsupializasyon; diş sürmesi; tüp dren; oral cerrahi

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Introduction

Dentigerous cysts (DCs) are the most common lesions of all developmental odontogenic cysts of the jaws and account for approximately 24% of all the jaws cysts (1). They develop around the crown of an unerupted tooth by expansion of the follicle when fluid is collected or a space is formed between the reduced enamel epithelium and the enamel of an impacted tooth. These cysts are always associated with an unerupted tooth or a developing tooth bud. DCs are most commonly found around the crowns of the mandibular third molars followed by maxillary canines, maxillary third molars and mandibular premolars (2).

DCs are usually observed in the second and third decades and rarely seen during childhood (3). In most cases, they are painless and asymptomatic which are the main reasons for them being detected through routine radiographs. The cyst may cause swelling, teeth displacement, delayed eruption, tooth mobility and sensitivity. Pain is seen only when the cyst becomes infected (4, 5). Radiographically they are usually characterized as unilocular radiolucent lesions, with well-defined sclerotic margins, enclosing the crown of an impacted tooth. Histopathologically, the dentigerous cyst consists of a fibrous wall lined by non-keratinized stratified squamous epithelium of myxoid tissue, odontogenic remnants and rarely sebaceous cells (6, 7). The methods for treating a DC are enucleation and marsupialization, the latter being a more conservative approach. If left untreated, DCs may cause pathologic bone fracture, impaction of teeth, asymmetry, ameloblastoma and development of squamous cell carcinoma and mucoepidermoid carcinoma (8). The aim of this report is to present a case of dentigerous cyst located in the mandibular premolar region which was treated by decompression that has led to the spontaneous eruption of the canine and first premolar teeth without orthodontic appliances.

Case Report

An 11 year old boy was referred to our department with the complaint of painless facial swelling in his mandibular mental region. An intraoral examination revealed a bony expansion in the region of the left mandibular primary first and second molars (Figure 1). There was no active discharge of pus and no lymph nodes were palpable. The informed consent

was taken from the patient and his family for the surgical treatment. The aspiration of the cyst content showed thick straw-colored oily fluid.



Figure 1. Preoperative intraoral view of the patient.

A radiographic examination showed a large, circular, well-defined unilocular radiolucent area starting from the left mandibular lateral incisor and extending to the left mandibular second premolar. The cystic lesion enclosed the left mandibular canine and first premolar which were impacted and displaced. No signs of root resorption were evident in the adjacent teeth (Figure 2). The initial diagnosis depending on the clinical and radiographic examination was dentigerous cyst.

The primary left first and second molars were extracted and marsupialization of the cyst was performed. A tissue sample was also taken for the biopsy. A silicone tube was inserted to the extraction socket of the second primary molar to relieve the pressure. Histopathologic examination of the sample confirmed our initial diagnosis as dentigerous cyst (Figure 3). The silicone tube was replaced weekly for 6 months postoperatively. The radiograph taken at the first month follow-up visit showed a decrease in the radiolucency at the cyst site and the impacted teeth straightening (Figure 4). After 4 months the impacted teeth were at a vertical position and new bone formation was evident at the former cyst site (Figure 5). The panoramic radiograph taken at the 9 month follow-up revealed the spontaneous eruption of the impacted lower canine and premolar with no radiolucency around the teeth (Figure 6).

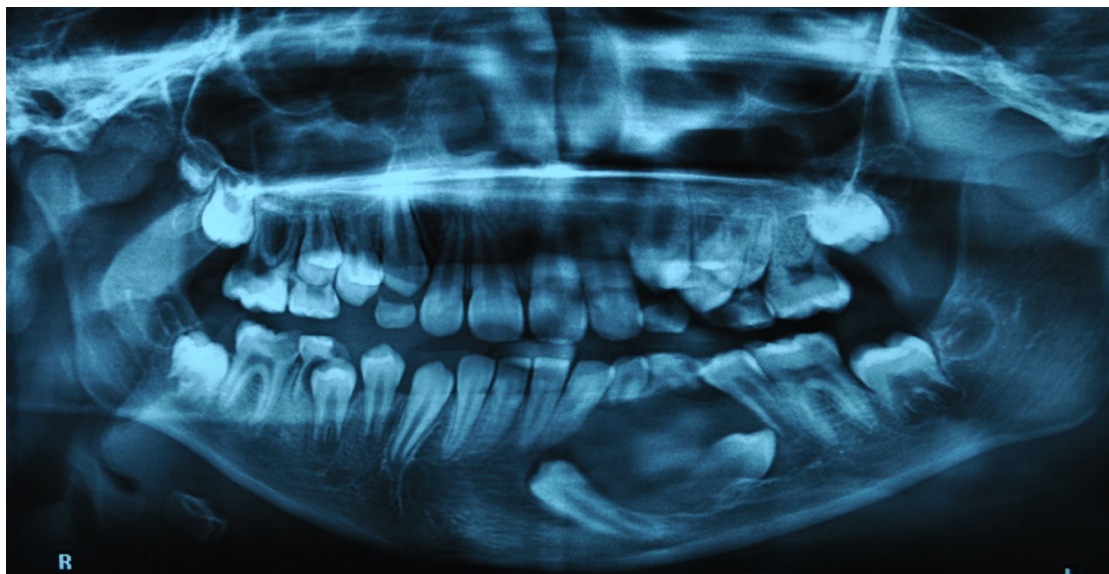


Figure 2. Preoperative panoramic radiography of the patient.

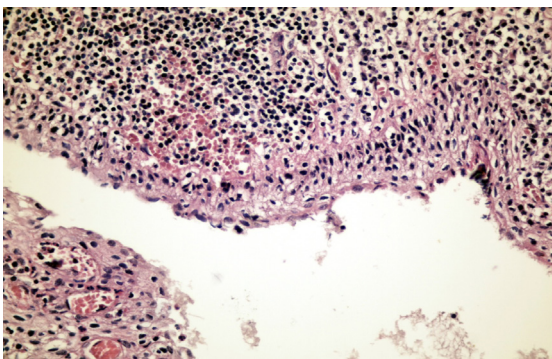


Figure 3. Histopathologic image of the lesion (H&E staining X200).

Discussion

Dentigerous cyst is the most common type of developmental odontogenic cysts. It may arise from the accumulation of fluid between the enamel epithelium and the crown of the permanent tooth germ or from remnants of the odontogenic epithelium. It is also stated that a DC can be caused by inflammation of the periapical tissues due to necrosis or a periapical infection originating from the primary predecessor tooth, which could stimulate the developing tooth germ follicle (9).



Figure 4. Postoperative radiography of the patient at the first month.

Benn and Altini (10) categorized DCs as developmental and inflammatory cysts. Developmental DCs typically occur in mature permanent teeth, usually as a result of impaction, and predominantly involve the mandibular third molars. Generally they are discovered in routine radiographs in the late second or third decades of life. Inflammatory DCs could occur in immature permanent teeth as a result

of inflammation from a non-vital primary tooth. This variation of DC is usually diagnosed in the first and early second decades on routine radiographs or when the patient complains about a painless swelling (10). Similarly in our case, the patient's age and the clinical and radiographic findings suggest an inflammatory DC. However the primary molars, although affected with caries, were vital and not necrotic.



Figure 5. Postoperative radiography of the patient after four months.



Figure 6. Postoperative panoramic radiography at the 9 month.

Therefore, it is not always possible to determine where the cyst originated from. Patients with DC do not experience pain unless the cyst becomes inflamed. It can cause cortical expansion that results in facial asymmetry (11). A study done by Koca *et al.*(12) suggested that 70% of the patients with a DC complained about a swelling and, 5% stated that they have pain whereas 25% of the patients

had no symptoms. In this case painless buccal expansion was clear as the patient was referred to our clinic. Since DC usually presents as a unilocular, well-defined radiolucent lesion without prominent clinical symptoms, differential diagnosis should include the radicular cyst, odontogenic keratocyst, ameloblastoma, odontogenic fibromyxoma and odontoma (4, 9).

Treatment options include complete enucleation and marsupialization. If the cyst is associated with a supernumerary tooth, complete enucleation of the cyst along with extraction of the tooth may be the first choice. If preservation of the displaced teeth is desired, marsupialization, which is a more conservative option, may be considered. Marsupialization consists of uniting the cyst lining to the oral mucosa. This method has fewer complications than enucleation regarding the preservation of important anatomical structures and developing tooth germs. The disadvantages of marsupialization are the prolonged treatment period and the pathologic tissue which may be left *in situ*. Ameloblastoma, squamous cell carcinoma or mucoepidermoid carcinomas have been reported to form from the cells in the lining of the cyst. Also, there is always a possibility of leaving a more aggressive lesion in the residual tissue (13).

It is a known fact that, although DCs inhibit the eruption of the cyst-associated permanent teeth, maturation of the roots of these teeth continues (14). Miyawaki *et al.* (15) reported that an impacted tooth might erupt faster if marsupialization is performed at a time when the tooth has the ability to erupt. There is however an ongoing debate about the ability of the teeth to erupt. There seems to be a close correlation between the eruption and the degree of root formation. Most of the authors believe that a tooth with an incomplete root formation will erupt more easily. There are others who also suggest that the eruption of the teeth occurs more easily when the root formation is complete (15). Whatever the case may be, the abnormally tilted tooth axis usually improves rapidly within the first 3 months after marsupialization. Hyomoto *et al.* (16) suggested that a period of 100 days after the initial therapy is the critical time for deciding whether to extract or to use orthodontic traction. For the first 3 months, when the shrinkage of the cyst can promote tooth eruption, the patients should be observed closely without performing enucleation or extraction of the impacted teeth. In our case, we spotted a change in the angulation of the impacted canine and premolar just after 1 month. After seeing the response of the patient to the marsupialization therapy we decided to wait and to avoid enucleation.

The treatment plan in this case was simple and atraumatic; however a long follow-up care was required during the treatment period. Postoperatively, all clinical and radiographic findings showed normal features, new bone formation, and spontaneous

eruption of the impacted teeth in their correct position just after 9 months. Since immature teeth with incomplete root formation and open apices have an optimal eruption potential and children have much greater bone regeneration capabilities than adults, the prognosis of conservative surgical techniques in young patients are usually successful.

Conclusion

According to the cyst size, age of the patient, proximity to vital structures and the strategic value of the impacted teeth conservative treatment is a favorable treatment modality for large dentigerous cysts. The eruption of the impacted teeth is dependent on the patient's early age and root formation.

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Conflict of interest

None declared

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