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Case Report

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Treatment of Dentigerous Cyst in Pediatric Patients: Two Case Reports

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Abstract

Introduction: Dentigerous cysts are benign developmental lesions of the jaws that grow asymptotically, usually associated with an impacted tooth. These lesions can cause many complications such as pain, paresthesia, resorption, and tooth displacement over time. The treatment approach in dentigerous cysts generally consists of surgical interventions including marsupialization and enucleation methods. In this study, the treatment of dentigerous cysts in 2 pediatric patients was presented and it was aimed to discuss the outcomes of treatment methods in the light of evidence based dentistry.

Case report: The patients were referred to Istanbul Kent University, Department of Pedodontics, for routine check-ups. In the first case, the panoramic radiograph and computed tomography examinations showed large, circular, well-defined unilocular areas covering the crowns of mandibular left and right third molars in an 11-year-old boy. The second case was a 13-year-old girl with swelling in the right mandible region. The panoramic radiograph and computed tomography examinations showed a large, circular, well-defined cyst covering the crown of the mandibular right second premolar. The teeth were extracted, and the enucleation technique was performed in both cases. The lesions were diagnosed as dentigerous cysts according to the pathology results. Long-term clinical and radiographic follow-ups of the patients were planned.

Conclusion: Treatment of dentigerous cysts in pediatric patients requires a multidisciplinary approach, and many factors are effective in treatment planning.

Keywords: Dentigerous cyst; Pediatric dentistry; Enucleation

Introduction

Dentigerous cysts, also known as follicular cysts, are benign developmental lesions of the jaws that grow asymptotically [1]. It forms at the cemento-enamel junction, enclosing the crown of an unerupted tooth, as a result of a change in the reduced enamel epithelium [2]. Dentigerous cysts are the second most common odontogenic cysts after radicular cysts and frequently seen in secondary dentition, which makes them uncommon in childhood [3, 4]. The maxillary canine, mandibular premolars, and mandibular

third molars are the teeth that are most commonly affected [5].

Dentigerous cysts are slowly growing, typically asymptomatic, and incidentally found during radiographic examination [6]. The cyst typically doesn't cause any pain or discomfort [1]. Radiographically, a dentigerous cyst is seen as a well-defined unilocular radiolucency that surrounds the crown of an impacted tooth and frequently has a sclerotic border [7].



As the cysts expand, they may cause a palpable mass [1]. These lesions can cause many complications such as pain, paresthesia, resorption, pathologic fractures, tooth displacement/impaction and bone deformities over time [8, 9].

Multiple and bilateral dentigerous cysts are typically observed in developmental syndromes such as mucopolysaccharidosis, Maroteaux-Lamy syndrome, and cleidocranial dysplasia [10-12]. When these disorders are absent, bilateral and multiple dentigerous cyst occurring is very rare [12, 13]. The treatment decision of dentigerous cysts is based on the patient's age, location, and extent of the lesion [14]. The treatment approach in dentigerous cysts generally consists of surgical interventions including marsupialization and enucleation methods [9, 15]. Treatment often involves extraction and enucleation of the affected teeth. Marsupialization is the first step in the treatment of large cystic lesions, and then enucleation [16]. In mixed dentition, the prognosis is better with conservative therapy that involves extraction of primary teeth and marsupialization to permit spontaneous eruption of permanent teeth [17-19].

The aim of the present study is to present the treatment of dentigerous cysts in two pediatric patients and to discuss the outcomes of treatment methods in the light of evidence-based dentistry.

Case Reports

Written informed consents were obtained from the patients parents' to publish anonymized information in this article.

Case 1

An 11-year-old boy was referred to Istanbul Kent University, Department of Pedodontics, with the complaint of dental pain related to the upper left first molar. There was no relevant medical or dental history. Intra-oral examination revealed a deep caries lesion of the upper left first molar. The panoramic radiograph and computed tomography examinations showed large, circular, well-defined unilocular areas covering the crowns of mandibular left and right third molars (Figures 1, 2).

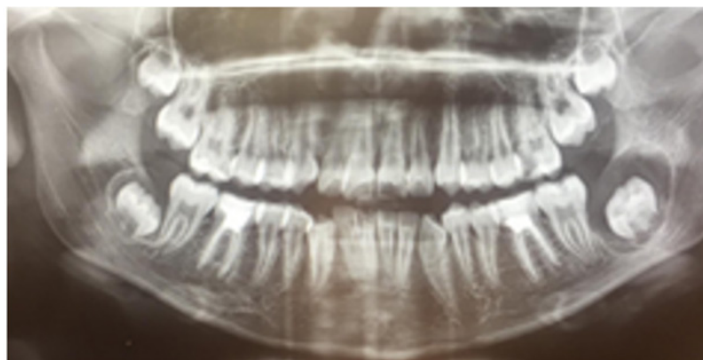


Figure 1: The panoramic image revealed large radiolucencies associated with mandibular left and right third molars.

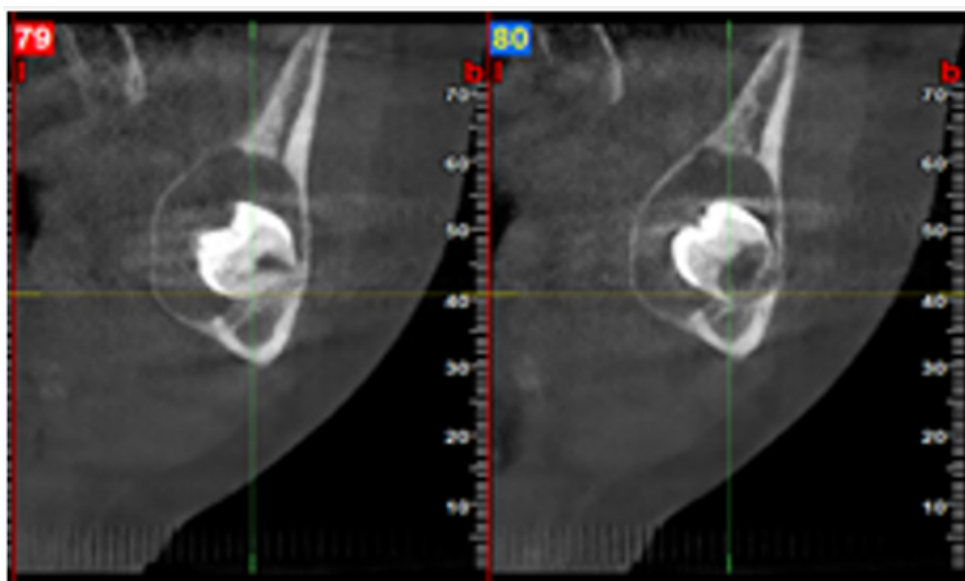


Figure 2: Preoperative computed tomography examination showing large, circular, well-defined unilocular areas covering the crowns of mandibular left and right third molars.

The root canal treatment was performed for the upper left first molar. The mandibular left and right third molars were extracted, and complete enucleating of the cysts was performed under general anesthesia. The specimen was submitted for histopathologic

evaluation, which later confirmed the diagnosis of a dentigerous cyst. The healing of all hard tissues in the area of the cystic lesions was observed after 1 year control (Figure 3).

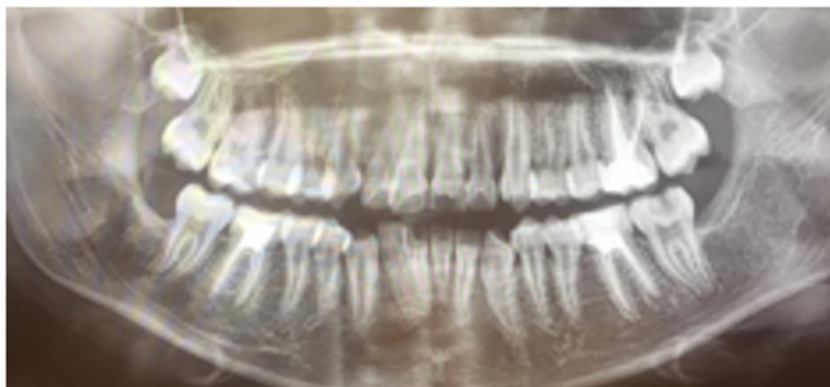


Figure 3: The healing of all hard tissues in the area of the cystic lesions was observed after 1 year radiographic control.

Case 2

A systematically healthy 13-year-old girl was referred to Istanbul Kent University, Department of Pedodontics, for routine check-ups. The patient's chief complaint was swelling in the lower right side of her mandible for 2 months. There was no relevant medical or dental history. The patient was moderately built and nourished. Intra-oral examination revealed palpable vestibular swelling that expanded from the mandibular right first premolar region to the mandibular right first molar region. The swelling

was painless, firm, and there were no inflammatory signs in the overlying mucosa during palpation. A retained mandibular right second primary molar was present with a deep caries lesion. A bifid crown in the mandibular right lateral tooth was diagnosed as gemination according to the radiographic appearance. Lymph node examination eliminated the presence of any pathology.

The panoramic radiograph and computed tomography examinations showed a large, circular, well-defined cyst covering the crown of the mandibular right second premolar (Figures 4, 5).

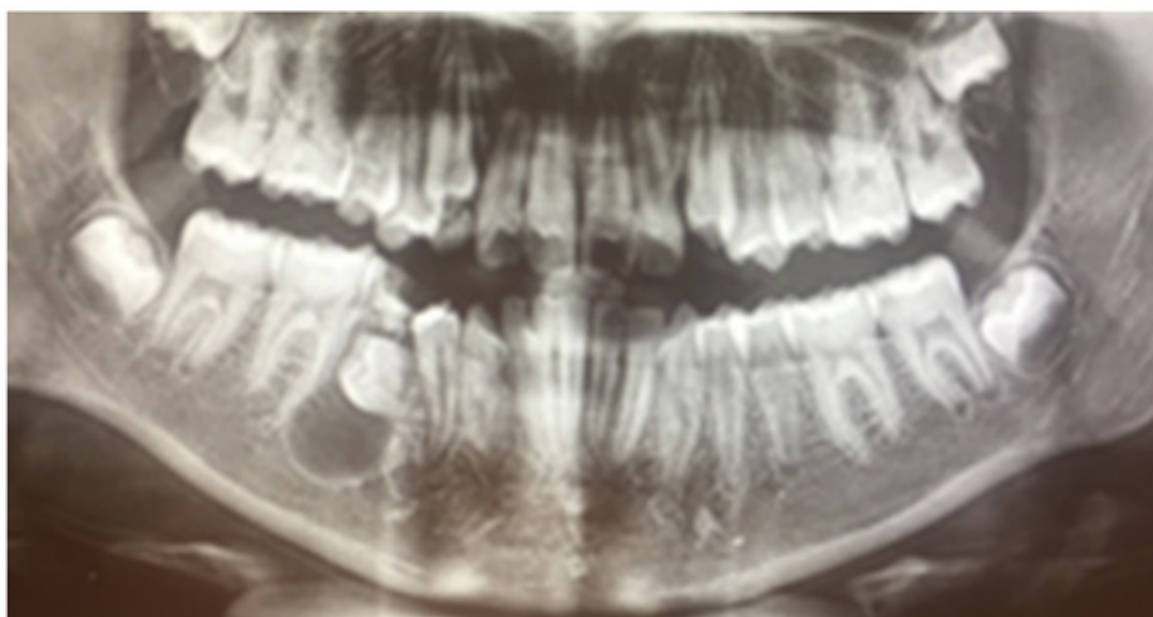


Figure 4: Preoperative panoramic radiograph showing an oval radiolucent lesion in the mandible.

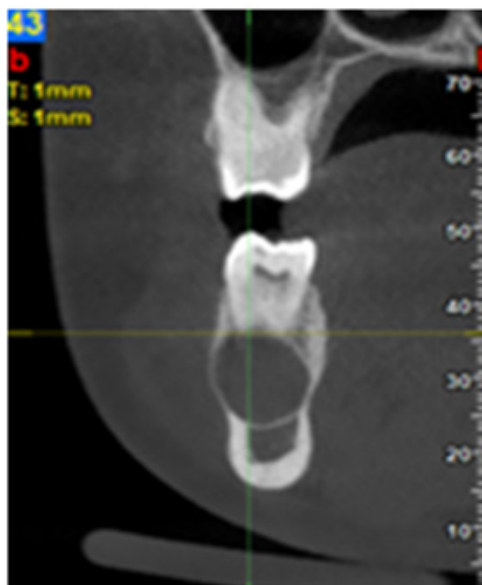


Figure 5: Preoperative computed tomography examination showing a well-defined cyst covering the crown of the mandibular right second premolar.

The mandibular right second primary molar was extracted, and a complete enucleation of the cysts was performed under general anesthesia. The specimen was sent for histopathological investigation, and according to the pathology result, the lesion was

diagnosed as a dentigerous cyst. The spontaneous eruption of the mandibular second premolar was seen after 1 year control (Figure 6). Long-term clinical and radiographic follow-ups of the patients were planned.

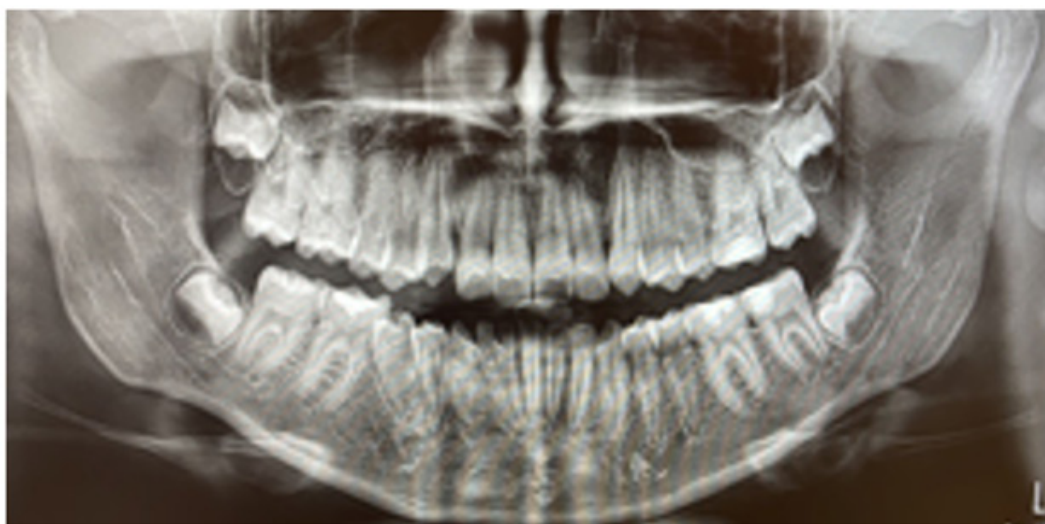


Figure 6: Follow-up panoramic radiograph 1 year later showing spontaneous eruption of mandibular second premolar.

Discussion

A dentigerous cyst can be inflammatory or noninflammatory [20]. Dentigerous cyst pathophysiology is still unknown, but several theories are proposed. According to the first theory, a dental follicle that has been secondarily inflamed by a non-vital tooth may be the

source of the developing dentigerous cyst [4]. The second theory suggests that a dentigerous cyst of extrafollicular origin would arise from the formation of a radicular cyst at the apex of a non-vital deciduous tooth, which would be followed by the eruption of its permanent replacement into the radicular cyst [20]. Additionally,

Benn and Altini [4] proposed that a dentigerous cyst could occur if a permanent successor's follicle becomes secondary infected from other sources than the non-vital deciduous tooth [4, 21].

In this report, the first case showed a noninflammatory type of dentigerous cysts, however the second case suggested that the dentigerous cyst's inflammation may have originated from an infection of the second primary molars.

In radiography, follicular spaces greater than 5mm are suspected of being dentigerous cysts [1, 7]. Radiographically, a dentigerous cyst is seen as a well-defined unilocular radiolucency that covers the crown of an impacted tooth and frequently has a sclerotic border [7].

Odontogenic tumors, odontogenic keratocysts, and primordial cysts must be considered in the differential diagnosis of a dentigerous cyst [22]. A histopathological examination can help an accurate diagnosis as radiography alone is unable to distinguish between the other lesions [21].

Histologically, dentigerous cysts consist of a fibrous wall that contains varying amounts of odontogenic remnants and myxoid tissue [23, 24]. Muco-sebaceous, sebaceous, and ciliated cells make up the nonkeratinized stratified squamous epithelium that lines the cyst [24]. When inflammation is present, the flattened epithelial-connective tissue interface becomes irregular [23]. Pseudoepitheliomatous hyperplasia, acute and chronic inflammatory infiltrates are frequently present [24].

Dentigerous cysts can be treated with either complete enucleation or marsupialization. Marsupialization may be recommended especially in younger patients and in cases when a large cyst increases the risk of surrounding tissue damage and a pathologic fracture of the jaw [25, 26].

Marsupialization is less complicated than enucleation with preserving of important anatomical structures and developing permanent tooth germs [21]. The pathologic tissue left in place after marsupialization is the disadvantage of marsupialization [1].

The cells in the lining of a dentigerous cyst can develop into ameloblastoma, squamous cell carcinoma, or intraosseous mucoepidermoid carcinoma; but the recurrence in dentigerous cyst is uncommon when the cyst is completely removed [26]. A radical method for removing all the cystic capsule is enucleation. Enucleation is the preferred method whenever the cyst is small, and saving the involved tooth is impossible [27].

Bilateral dentigerous cysts in the absence of a syndrome are rare, and the most common site of occurrence of the cyst is the mandibular region. The present cases were non syndromic; the lesions were in the mandibular region; and there was the presence of bilateral dentigerous cysts in our first case. In the present cases, the involved teeth were extracted, and the enucleation technique was performed. In the second case, the cyst led to a delay in the eruption of the lower right second premolar and an incorrect tooth position in the dental arch. The tooth spontaneously erupted after the surgical treatment of the cyst.

Treatment of dentigerous cysts in pediatric patients requires a multidisciplinary approach, and many factors are effective in treatment planning. The anatomic site, clinical extent, size of the cyst, and also the age and cooperation of the child must be taken into account in treatment planning. In these cases, the surgeons preferred the enucleation method according to the patients' cooperation.

Conclusion

Asymptomatic dentigerous cysts can be diagnosed early in children during routine controls. A spontaneous eruption of a permanent tooth is possible after the surgical treatment of a dentigerous cyst. In order to prevent related complications and detect any pathological changes, periodic evaluation and long-term follow-up of the patients are necessary.

Author contributions

EO, ES, SŞ participated in designing the study. BY, ETA participated in generating the data for the study. ES, BY, ETA participated in the analysis of the data. ES, BY, ETA wrote the majority of the original draft of the paper. EO, SŞ participated in writing the paper. EO, ES, SŞ, BY, ETA have approved the final version of this paper. ES guarantee that all individuals who meet the Journal's authorship criteria are included as authors of this paper.

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Conflict of Interest

The authors had no conflict of interest to declare.

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