

Marsupialization of Dentigerous Cyst: Report of a Case

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Abstract Dentigerous cyst is a common pathologic entity associated with an impacted tooth. The standard treatment for this lesion is enucleation and extraction of the involved tooth. Marsupialization of dentigerous cyst has also been advocated, once in many cases it can maintain the impacted tooth in its cavity and promotes its eruption. This report describes a case of a 13-year-old girl with a large dentigerous cyst associated with mandibular right second molar. The cyst was marsupialized and the patient was checked weekly. Two months after the surgical procedure the impacted tooth was completely erupted without orthodontic traction and therapy.

Keywords Dentigerous cyst · Enucleation · Marsupialization · Impacted tooth

Introduction

Dentigerous cyst is one of the most commonly encountered jaw cysts and it appears as a radiolucent well-defined

odontogenic lesion that surrounds the crown of an unerupted tooth preventing its eruption [1, 2]. The key to the formation of a dentigerous cyst appears to be the accumulation of fluid, originated by the pressure exerted by a potentially erupting tooth on the follicle, either between the reduced enamel epithelium and the enamel or between the layers of the enamel organ [3].

Dentigerous cyst is more common in male patients and most commonly develop in the second and third decades of life [1, 3, 4]. This cyst is associated with teeth that develop impactions, such as third molars and canines [5] and might also affect unerupted supernumerary teeth or odontomas [1, 4].

Clinically, a localized swelling of the alveolar bone can be detected [6], however, dentigerous cysts can be asymptomatic during a long period of time, leading to a significant destruction of bone [7]. The lesion is usually detected by routine radiographic examination and, in general the suspicion of the existence of a dentigerous cyst arises when the radiographic image of the follicular space is larger than 5 mm in diameter [8].

The histopathologic examination reveals a non-keratinized stratified squamous epithelium delimiting the cystic lumen [3, 4].

Two principal methods of treating a dentigerous cyst are excision and marsupialization [4]. The treatment that involves enucleation of the cyst with the removal of the involved tooth is a very radical approach, however rarely results in lesion recurrence [8]. Marsupialization is advisable to preserve the cyst-associated tooth and promote its spontaneous eruption within the cyst when sufficient space for eruption exists [9].

This article reports the case of a large dentigerous cyst associated with the right mandibular second molar of a 13-year-old girl that was successfully treated with marsupialization.

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Report of a Case

A 13-year-old Brazilian girl was referred by her dentist to an oral and maxillofacial surgery clinic for consultation regarding a swelling in the right posterior vestibule. Physical examination revealed a light expansion in the right mandibular vestibule covered by healthy-appearing and freely movable mucosa that extended from the first molar to the retromolar area; the right second molar was absent in the dental arch. The patient denied any pain or altered sensation in her lip or tongue. Panoramic radiograph showed a well-defined multilocular osteolytic lesion measuring 3 cm in diameter and including an impacted second molar (Fig. 1). The root apices of the first molar were also involved but there were no signs of root resorption. The response of the first molar to pulp vitality test was positive. A needle aspiration biopsy was performed on the initial visit to establish whether the lesion was solid or cystic; a straw-colored fluid was aspirated. Based on the clinical, radiological and aspiration biopsy findings an initial diagnosis of dentigerous cyst was established. Because natural eruption of the second molar was possible, it was decided to perform marsupialization.

Under local anesthesia a buccal mucoperiosteal flap was elevated and the cyst membrane was fenestrated. The cyst membrane was sutured to the oral mucosa to create a window (Fig. 2). A specimen of the cyst membrane was sent for microscopic examination which revealed absence of keratinized epithelium, confirming the lesion was a dentigerous cyst. The patient was instructed to irrigate the cystic space with sterile saline three times a day. She was seen at office once a week and was examined radiographically bimonthly. One month after surgery the occlusal surface of the second molar could be seen and 2 months



Fig. 2 Transoperative view of the cystic cavity

later the tooth had completely erupted without orthodontic traction (Fig. 3). By the third postoperative month the cyst cavity was completely closed

The patient is recalled periodically for radiograph examination every 6 months and after a period of 24 months, panoramic radiograph revealed complete bone remodeling of the area with no recurrence of the cyst (Fig. 4).

Discussion

The dentigerous cyst is the second most common odontogenic cyst [8, 10]. In a study of 695 odontogenic cysts, the two most frequently diagnosed cysts were radicular cysts (53.5%) and dentigerous cysts (22.3%) [7].

Dentigerous cysts have the potential to resorb and expand into the surrounding tissue and displace bone and tooth roots causing malocclusion or facial asymmetry [11]. Inferior alveolar nerve paresthesia caused by a dentigerous



Fig. 1 Panoramic radiograph showing a well-defined osteolytic lesion measuring 3 cm in diameter. The right second molar is included in the lesion. Note that the root apex is still open



Fig. 3 Two months after marsupialization, tooth completely erupted



Fig. 4 Two-year follow-up showing complete bone remodeling and no sign of recurrence

cyst have also been reported [12]. However, in most of the cases this cyst is asymptomatic [4, 12] and diagnosed on routine dental radiographs usually appearing as a well-defined radiolucency associated with the crown of an unerupted tooth [5].

The differential diagnosis of a dentigerous cyst should include primordial cyst, radicular cyst, simple bone cyst, aneurysmal bone cyst, ameloblastoma, ameloblastic fibroma, adenomatoid odontogenic tumor, myxoma and keratocystic odontogenic tumor [3, 10, 12].

In the treatment of dentigerous cysts marsupialization has the advantage of reducing the cyst cavity and preserving the involved tooth in the cyst. However, because tooth eruption is not reliably predictable, clinical judgment might lead many clinicians to entirely remove the cyst and extract the tooth [9]. Lack of clinically useful evidence regarding tooth eruption complicates decision-making [6].

Previous studies supported the effectiveness of cyst marsupialization, presenting axis inclination of the tooth in the alveolar bone, root maturity and space availability as predictive indicators of further tooth eruption [6, 9]. An impacted tooth without complete root formation with an open apex has considerable potential to erupt, once the eruption potential is closely related to root formation [6, 9, 13]. For those cases where no eruption occurs, a period of 100 days after marsupialization is suggested as critical time for deciding whether to extract or use orthodontic traction [9]. In the present case the tooth erupted only by marsupialization without orthodontic traction; all the above mentioned factors were favorable: no inclination of the tooth, incomplete root formation and enough space to allow eruption.

Many cases previously reported have already shown good results in preserving cyst-associated tooth when marsupialization is performed. One case of four unerupted teeth associated with a large dentigerous cyst in mandible, was treated only by marsupialization, demonstrating the effectiveness of this technique in preserving the cyst-associated teeth. All teeth erupted without orthodontic

traction and therapy [4]. Gondim et al. [8] reported the case of a dentigerous cyst associated with the germ of a permanent maxillary central incisor that developed secondary to trauma to the predecessor primary incisor of a 4-year-old boy. The cyst was successfully treated with marsupialization and after 36 months of follow-up, the permanent incisor presented with normal physiologic conditions and erupted in its correct position in the oral cavity.

This case report supports the notion that marsupialization is significant in preserving a cyst-associated tooth and promoting spontaneous eruption of the involved tooth within the cyst.

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