Dental Traumatology

Dental Traumatology 2008; **24**: 676–679; doi: 10.1111/j.1600-9657.2008.00616.x

Conservative management of a dentigerous cyst secondary to primary tooth trauma

CASE REPORT

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Abstract – Pulp necrosis is a commonly observed sequela in traumatized primary teeth and is one of the possible etiologic factors for the development of dentigerous teeth. This article reports 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. The therapeutic approach included endodontic treatment of the primary tooth and marsupialization of the lesion. After 36 months of follow up, the permanent incisor presented with normal physiologic conditions, absence of dental anomalies and erupted in its correct position in the oral cavity. In conclusion, with proper case selection, marsupialization might be a good treatment option for conservative management of dentigerous cysts.

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Accepted 6 April, 2007

Dentigerous cyst is a radiolucent well-defined odontogenic lesion that surrounds the crown of an unerupted tooth and prevents its eruption (1–3). The etiology of dentigerous cyst remains unclear and several theories have been proposed to explain its origin (2, 4–8). One of the hypotheses suggests that the inflammation of periapical tissues originating from a primary tooth with necrotic pulp might stimulate the accumulation of fluid between the reduced enamel epithelium and the crown of the permanent tooth germ. Pulp necrosis is a frequently observed sequela after orodental traumatisms involving the primary dentition. In an analysis comprising over 500 traumatized primary maxillary incisors, pulp necrosis developed in 25% of the cases (9).

Dentigerous cysts most commonly develop in the second and third decades of life (2, 4, 10, 11) and are rarely observed associated with primary teeth (3, 4). A final diagnosis must be settled based on clinical, radiographic, and histopathologic criteria. In most cases, it is a single, asymptomatic entity that might cause the displacement of the affected tooth and facial asymmetry (2, 4, 11). Radiographically, it is a unilocular radiolucent lesion with well-defined margins that appear enclosing the crown of an unerupted/impacted tooth. In case of infection, the dentigerous cyst might become symptomatic and present ill-defined margins on radiographic examination. The histopathologic examination reveals a non-keratinized stratified squamous epithelium delimiting the cystic lumen (2, 4, 7, 11).

The treatment that involves enucleation of the cyst together with removal of the involved tooth rarely results in lesion recurrence. However, it is a very radical approach (2, 12). A more conservative management consisting of cyst marsupialization and watchful waiting for the spontaneous eruption of the unerupted/impacted tooth has been widely performed with successful outcomes (4–7).

This article reports 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.

Case report

A 4-year-old male patient was brought to the Center of Orodental Traumatism of the Federal University of Ceará, Brazil, with chief complaint of a progressive facial swelling on the anterior right region of the maxilla. During the clinical interview, the mother reported that the child had fallen 5 months before and traumatized the primary incisors and the peribucal region. Clinically, the patient was in primary dentition phase and all present teeth were in healthy condition except the primary right maxillary central incisor which was slightly mispositioned and presented a grayish coloration. Painful symptomatology was not reported by the patient. Radiographically, no signs of pathologic resorption were observed. However, a radiolucent lesion with well-defined margins and measuring 10 mm in diameter was

Fig. 1. Initial periapical radiograph suggesting the presence of a dentigerous cyst associated with the crown of the unerupted permanent right maxillary central incisor.

observed superposing the apex of the primary right maxillary central incisor and surrounding the crown of its permanent successor, which was slightly displaced (Fig. 1). The permanent right maxillary central incisor presented one-third of root development. A complete medical history and blood investigation was carried out to rule out any systemic contraindication for surgery. The diagnostic hypothesis of dentigerous cyst was suggested and was further confirmed by histopathologic examination (Fig. 2).

The common choice of treatment is enucleation of the cyst together with the impacted tooth, although if the eruption of the involved tooth is feasible, enucleation alone is performed (6, 12). In this case, the option was for a conservative management of the case comprising the endodontic treatment of the primary tooth followed by marsupialization of the cystic lesion in a subsequent session (Fig. 3). After 3 months, the radiographic control confirmed the success of the therapeutic approach with regression of the lesion, adequate positioning of the permanent right maxillary central incisor, and absence of signs of pathologic alterations on the primary right maxillary central incisor (Fig. 4). The patient was recalled periodically for clinical and radiographic examinations every 6 months. After a period of 30 months, the primary right maxillary central incisor had to be extracted due to great mobility presented.

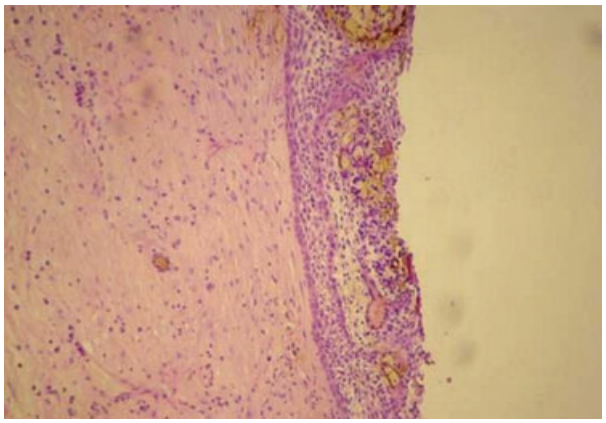

Fig. 2. Fibrous capsule with stratified squamous epithelium with chronic inflammatory infiltrate lining the lumen of the cystic cavity. HE (original magnification ×100).

Fig. 3. Clinical aspect 1 month after marsupialization.

Fig. 4. Periapical radiograph taken after 3 months of follow up. Note the regression of the lesion and adequate positioning of the permanent right maxillary central incisor germ.

After 36 months of follow up, the permanent right maxillary central incisor presented with normal physiologic conditions, absence of dental anomalies, and erupted in its correct position in the oral cavity (Fig. 5).

Fig. 5. Clinical aspect after 36 months of follow up. Note the correct alignment of the permanent right maxillary central incisor and absence of anomalies.

Discussion

The dentigerous cyst is the second most common odontogenic cyst. It is most frequently associated with mandibular third molars and maxillary canines and is usually detected by routine radiographic examination. This type of cyst might affect unerupted, impacted, or supernumerary teeth or odontomas (2, 11).

Three theories have been proposed to explain the etiology of the dentigerous cyst. The first theory suggests that fluid accumulation between the reduced enamel epithelium and the crown of the permanent tooth germ results from the pressure exerted by the erupting tooth on its own dental follicle, which would cause the exit of serum exudate from capillaries because of obstruction of venous return (11, 13). The second theory advocates that, along its eruption path, the immature permanent tooth encounters a radicular cyst originating from its primary predecessor. This is the least accepted hypothesis because radicular cysts rarely develop associated with primary teeth. According to the third theory, the dentigerous cyst would be caused by inflammation of the periapical tissues due to a periapical infection originating from the primary predecessor tooth, which would reach and stimulate the developing permanent tooth germ thus providing accumulation of fluid (5–8).

Trauma is one of the most frequent causes of pulp infection and necrosis in both primary and permanent teeth. The importance of seeking treatment immediately after sustaining a traumatic injury as well as periodically controlling the injured region lies in avoiding or minimizing the occurrence of major sequelae. Pulp infection and necrosis in primary teeth should be treated as soon as it is detected in order to prevent alterations to the germ of the permanent tooth or the need for more complex treatments in the future (9).

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. Other odontogenic cysts, such as the radicular cyst and the odontogenic keratocyst, as well as odontogenic tumors, such as ameloblastoma, calcifying epithelial odontogenic tumor (or Pindborg tumor) and odontogenic fibroma, might present characteristics similar to those of the dentigerous cyst (3, 12, 14). Therefore, histopathologic analysis is necessary in most cases to determine the type of lesion and confirm the diagnostic hypothesis.

According to Motamedi and Talesh (15), 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 (4, 6, 7, 15). 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 the case reported here, 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 (4–6).

The eruption of a tooth associated with a dentigerous cyst seems to be more influenced by its angulation and position inside the alveolar bone than by the cyst dimensions and amount of available space within the dental arch (5). Although the cystic lesion had displaced the germ of the permanent incisor, the tooth returned to a satisfactory position and erupted uneventfully after treatment. Conservative approaches have better prognosis in young patients than in adults because, in addition to the greater bone regeneration capacity of children, immature teeth have an optimal eruption potential (4, 6, 7).

Trauma might cause important sequelae on both primary and permanent dentitions and therefore should not be overlooked in order to avoid major damage, such as the development of cystic lesions, as reported in this article. The successful outcomes reached after 3 years of follow up show that, with proper case selection, marsupialization might be a good treatment option for conservative management of dentigerous cysts.

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