Dentigerous Cyst Associated with a Formocresol Pulpotomized Deciduous Molar

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Abstract

This report presents a case of dentigerous cyst associated with a formocresol pulpotomized deciduous molar detected during routine examination. Dentigerous cyst is an epithelial-lined developmental cavity that encloses the crown of an unerupted tooth at the cementoenamel junction. The present case describes a 9-year-old girl sent to the dental clinic by her dentist, who had accidentally discovered in the panoramic radiograph a single, unilocular, well-defined, radiolucent area enclosing the second left unerupted mandibular premolar. The second left primary molar had been pulpotomized 2 years before and buccal swelling without redness occurred near the tooth, evidencing bone expansion. Surgical treatment was carried out, the tooth was extracted, and a cystectomy was performed under local anesthesia in the dental office. The histological study confirmed the suspected diagnosis of dentigerous cyst. The relation between pulpotomy and dentigerous cysts is discussed. *(J Endod 2007;33:488–492)*

Key Words

Dentigerous cyst, primary molar, pulpotomy, tooth impacted

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Pulpotomy is considered a safe procedure, although side effects such as malposition, delay in eruption, enamel defects, discoloration, cyst formation, and damage to the permanent dentition have been reported (1–3). A dentigerous cyst can form in the periradicular region after pulpotomy (4, 5) caused by an alteration of the reduced enamel epithelium (after completion of amelogenesis), which results in fluid accumulation between the epithelium and the tooth crown (6). The persistent and prolonged inflammation may cause chronic irritation to the dental sac of the unerupted tooth, which in turn leads to the development of a dentigerous cyst (7). Histological evidence for this process has been found (8), concluding that inflammatory exudate is induced by infection that spreads to the dental follicle, causing separation of the reduced enamel epithelium from the enamel. This would be true for immature permanent teeth found under necrotic or pulp-treated primary teeth (9). Inflammation and prolonged irritation are apparent causes of, and the trigger for, proliferation of the epithelial rests (10). This explains why cysts are found in conjunction with necrotic or pulp-treated teeth in the primary dentition (9–11). Periradicular cysts described in association with pulpotomized primary molars seem to show specific clinical features: large size, rapid growth, buccal expansion, and displacement of succedaneous teeth (5, 11). Grundy et al. (9) recorded the time lapse between the pulp therapy and the detection of buccal bone expansion; it ranged from 5 months to 3 years, the average being 20 months.

A dentigerous cyst is an epithelial-lined developmental cavity that encloses the crown of an unerupted tooth at the cementoenamel junction, and thus it is also named "tooth-containing cyst." The cyst arises from the separation of the follicle from the crown of an unerupted tooth and, although it may involve any tooth, the mandibular third molars are the most commonly affected, followed by maxillary canine, mandibular premolars, supernumerary teeth, and, rarely, the central incisor (12).

Dentigerous cysts are the second most commonly occurring odontogenic cysts after radicular cysts, accounting for roughly 24% of all true cysts in the jaws, representing the most common intrabony lesion of jaws in children. These cysts are frequently discovered when radiographs are taken to investigate a failure of tooth eruption, a missing tooth, or misalignment (13).

The cyst usually presents as a single lesion. However, bilateral and multiple cysts can occur in association with syndromes, including delayed dental eruption, such as cleidocraneal dysplasia, nevus basocelular syndrome, and Hunter's disease, and also in association with alterations of the PTCH gene (14), the superexpression of the P53 gene (15), and treatments with cyclosporins.

Epidemiological studies carried out by Mourghed (16) found a total prevalence of 0.8% for a dentigerous cyst and 3.6% in patients with an unerupted tooth.

Although cysts related to primary molars are frequent (10), they tend to be overlooked because they usually resolve after removal or exfoliation of the primary teeth. For the same reasons, biopsies are seldom taken. The only cases reported have been those in which the cyst became enlarged before detection and in which severe symptoms and side effects were already present (5, 10). The prevalence in the mandible and the relationship of cyst development to the second primary molars have been stressed (7, 10, 17). Two possible explanations are that the mandibular molars are associated with greater susceptibility to caries and more treatment and that a mandibular second primary molar is more closely associated with its successor's follicle (5); such associ-

ation can more easily facilitate the spread of inflammation in comparison with other primary teeth (17).

This study reports a case of dentigerous cyst associated with formocresol pulpotomy detected during routine examination in a patient with transitional dentition.

Case Reports

A 9-year-old girl presented to the dental clinic sent by her dentist, who had accidentally discovered a lesion in the panoramic radiograph. Her medical and dental history was uneventful. She had suffered a dental injury. The four upper incisors were splinted with composite resin and did not show symptoms or signs of pulp involvement. Upper temporary molars have not yet exfoliated. A Chrom-nickel crown (3M, TM) was evident on tooth #75, pulpotomized 2 years before as related by the patient's mother. Local buccal swelling without redness occurred near the tooth, evidencing bone expansion, although the gingiva and alveolar mucosa appeared normal (Fig. 1). A panoramic radiograph showed a mandibular radiolucent lesion (Fig. 2). A single, unilocular, well-defined, radiolucent area enclosed the second left mandibular premolar. A dentigerous cyst was initially diagnosed. To better study the radiolucent lesion, taking into account its proximity to the mentonian nerve, a mandibular TAC (Dentascan) was requested (13, 18) (Fig. 3). Thus, the great size of the lesion could be appraised not only in the mesiodistal aspect, but also in the buccolingual one. The swelling, the buccal cortical break, and the bone expansion were obvious. These features indicated a benign lesion.

The patient was informed about the nature of her lesion, a dentigerous cyst, and the low possibility (6% according to WHO) (19) of developing an amelobastoma. The patient's parents and her dentist asked for the total excision of the cyst. Before intervention the following medication was prescribed and supplied to the patient: (1) hydroxicine dichlorhidrate (Atarax): 25 mg the night before the intervention and other 25 mg dose 1 hour before. (2) Amoxycilin/Clavulamic acid 500/125 mg (Augmentin): one dose the night before, continuing for 6 days after the intervention every 8 hours. (3) Ibuprofen (Dalsy): a 200 mg dose the night before and another one 1–2 hours before the intervention, continuing it with the same guideline as that of the recommended antibiotic.

With the suspected diagnosis of a dentigerous cyst associated with a retained premolar, surgical treatment was carried out, the tooth was extracted, and a cystectomy was performed under local anesthesia in the dental office. The buccal flaps were raised and the cysts enucleated

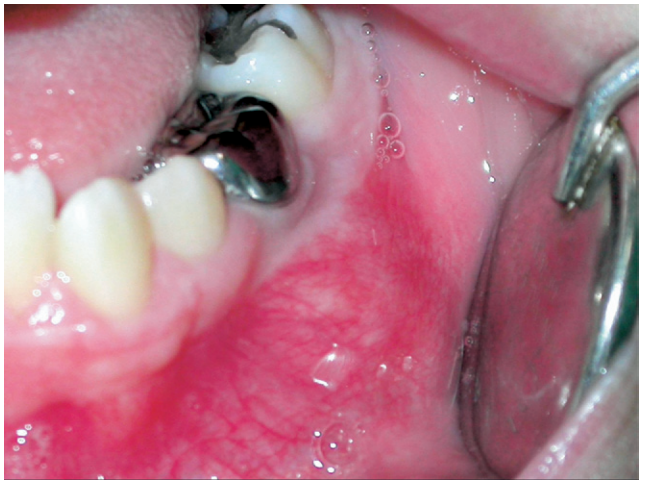

Figure 1. Clinical feature of the lesion.

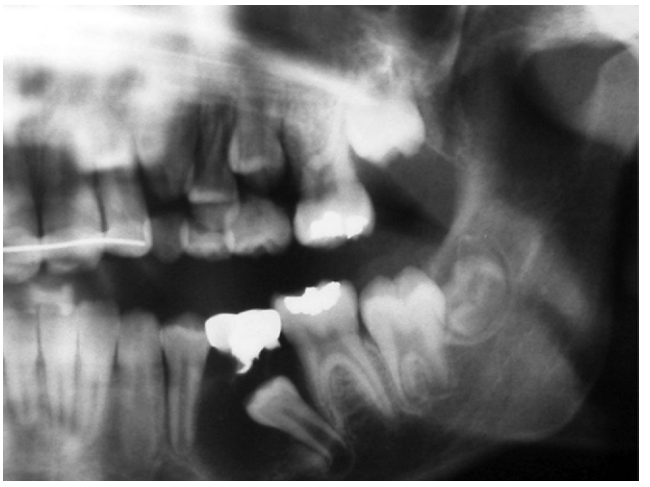

Figure 2. Panoramic radiograph showing displacement and retention of succedaneous premolar and mandibular canal. Primary molar has been pulpotomized.

together with the retained tooth (Fig. 4). The histological study confirmed the suspected diagnosis (Fig. 5). Microscopically, a dense fibrous connective tissue cyst wall was lined by remnants of dysplastic keratinizing stratified squamous odontogenic epithelium. The lining cells demonstrated a degree of nuclear and cellular pleomorphism and nuclear hyperchromatism. In focal areas, islands and strands of cells invaded the cyst wall. These invasive cords were composed of keratinizing squamous cells with occasional mitotic activity. The cords were separated by collagenous fibrous connective tissue and focal areas showed chronic inflammatory cell infiltrates. No evidence of nuclear palisading or reverse polarity of cells was noted within the islands. Healing was uneventful and, 1 week after the operation, the surgical sites showed good healing. After 3 months, there had been complete healing. There was also no evidence of recurrence of the cysts (Fig. 6).

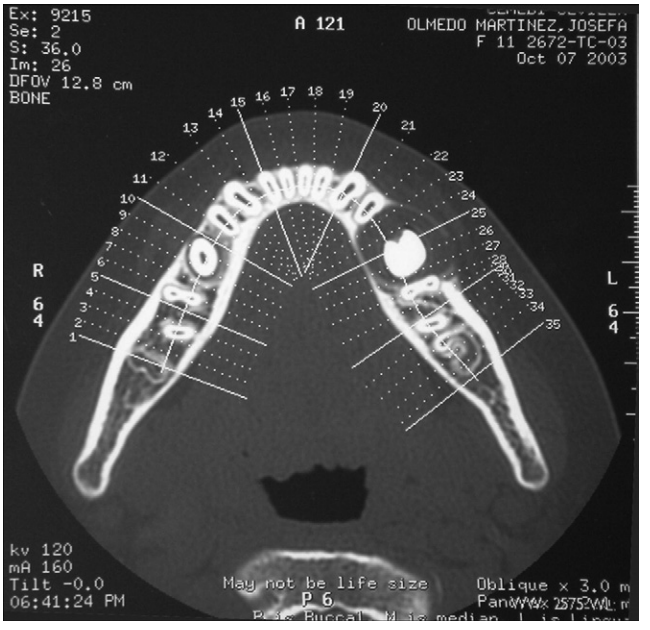

Figure 3. Mandibular TAC (Dentascan). The great size of the lesion is appraised not only in the mesiodistal aspect, but also in the buccolingual one.