

Dentigerous Cyst in Children: A Case Report and Outline of Clinical Management for Pediatric and General Dentists

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ABSTRACT

Dentigerous cysts are the most common developmental odontogenic cysts of the jaw, arising from impacted, embedded or unerupted permanent teeth. They apparently develop by accumulation of fluid between the reduced enamel epithelium and the tooth crown of an unerupted tooth. There is usually no pain or discomfort associated with the cyst unless there is an acute inflammatory exacerbation. Careful evaluation, coupled with meticulous clinical and radiological investigations could help clinicians to arrive at the correct diagnosis as well as address the implicated etiologies, before instituting the most appropriate therapy. Here, we report a case of a dentigerous cyst in the mixed dentition of a 10-year-old female patient and outline its comprehensive management for the benefit of pediatric and general dentists involved in the care of such patients.

Keywords: Dentigerous cyst, Mixed dentition, Pediatric oral surgery, Marsupialization.

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INTRODUCTION

Children are victims of a spectrum of jaw lesions, with etiologies ranging from developmental aberrancy to neoplasia. The most common developmental lesions afflicting the jaws in children are the ones which have an odontogenic origin.^{1,2} Dentigerous cysts are one of the most prevalent odontogenic cysts associated with an erupted or developing tooth, particularly the mandibular third molars; the other teeth that are commonly affected are, in order of frequency, the maxillary canines, the maxillary third molars, and rarely the central incisors.^{3,4}

A dentigerous cyst is an epithelial-lined developmental cavity derived from the epithelial remnants of the tooth-forming organ that encloses the crown of an unerupted tooth at the cemento-enamel junction. The crown projects into the cystic space while the tooth remains unerupted because of the overlying cyst. If the cyst reaches a large size (>2 cm in diameter), swelling, mild sensitivity, tooth mobility and displacement may be observed.⁵ Though dentigerous cysts are benign odontogenic cysts associated with crowns of permanent teeth, some cases of these cysts being associated with deciduous teeth, and supernumerary teeth have also been reported.⁶

Radiographically these cysts appear in close approximation to the crowns of unerupted teeth as well-defined unilocular pericoronal radiolucencies with well-corticated sclerotic margins, unless secondarily infected. Occasionally, trabeculations can be seen giving the appearance of a multilocular lesion. This cyst may involve adjacent teeth and may cause root resorption and/or displacement.⁷

Younger patients with unerupted or impacted teeth, have more predilections for dentigerous cysts.³ Their early recognition and treatment is imperative to prevent further proliferation leading to osseous deformities and gross destruction. The dentigerous cyst may enlarge and extend posteriorly to involve ramus, or anteriorly into the body of the mandible to involve roots of adjacent teeth. It can also expand into the antrum displacing involved teeth posteriorly or toward the orbital floor.

Marsupialization is the treatment of choice, for dentigerous cysts involving unerupted favorably positioned teeth to contemplate for a smooth uneventful eruption of underlying teeth, however, for longstanding large lesions with teeth in unfavorable positions; enucleation of the cyst along with the removal of offending teeth remains the gold standard.⁸

Possible complications arising from long untreated dentigerous cysts include:

1. Permanent bone deformation or pathologic bone fracture
2. Expansive bone destruction
3. Loss of permanent teeth
4. Development of squamous cell carcinoma, mucoepidermoid carcinoma and ameloblastoma.⁹

Management of dentigerous cysts in primary and mixed dentitions needs special consideration for meticulous preservation of the developing permanent tooth buds. However, loss of a permanent tooth in the procedural management of a dentigerous cyst could be devastating to a child in more ways than one. Here, we report a case of dentigerous cyst in the mixed dentition of a 10-year-old female patient and its management.

CASE REPORT

A 10-year-old girl presented to the Department of Pedodontics and Preventive Dentistry with a chief complaint of pain and swelling in the lower left back region of the

mouth. The swelling had apparently enlarged over the preceding month, leading to facial asymmetry. On general examination, the patient was apparently healthy. Medical history was nonsignificant. Clinical history revealed that the swelling started as a small painless nodule which increased to the present size over a period of 1 month. Past dental history suggested that pulp therapy had been performed followed by stainless steel crown placement in relation to teeth 74 and 75.

On extraoral examination, facial asymmetry was noted on left lower side of the face, with no sinus opening or active pus discharge. Intraoral examination revealed a hard swelling in 74, 75 region with obliteration of the buccal vestibule. The swelling was bony hard with expansion of the buccal cortex in 74, 75 regions. The lingual cortex remained unaffected. Stainless steel crowns were present over teeth 74 and 75 (Fig. 1). There was a 'typical egg shell cracking' found in 75 region.

Panoramic radiography (Fig. 2) revealed an unilocular well-defined radiolucency associated with an unerupted mandibular left second premolar causing the displacement

of permanent lower left first premolar toward the mesial side. Radiolucency spanned across to the mandibular lower border beginning from the left first bicuspid to mesial root of permanent mandibular left first molar. The mesial root of the deciduous second molar showed resorption.

Histopathologic examination of the aspirated biopsy showed a cystic lesion, and a presumptive diagnosis of a dentigerous cyst was made.

Marsupialization (Fig. 3) was considered as the treatment of choice for minimize damage and favor an uneventful eruption of affected tooth. Prior to surgery, routine blood and urine examinations were carried out and, the results were within normal limits. After obtaining an informed consent, surgical intervention was performed under local anesthesia. Treatment procedure comprised of extraction of 74, and 75 thus creating a large window. The flap was reflected along with the thinned-out bone. The contents of the cyst were evacuated, and the cystic cavity was thoroughly irrigated to remove any residual fragments and debris. The cavity was then packed with iodoform-glycerin gauze. The dressing was placed in such a manner so as to stabilize displaced premolars in their minimally developed sockets and to guide their eruption. The evacuated surgical specimens were histopathologically examined to confirm the diagnosis of dentigerous cyst. The patient was advised to maintain good oral hygiene and a chlorhexidine mouthrinse was prescribed. The patient was recalled after 7 days for dressing change as well as to facilitate gradual decompression of the cavity thus, aiding the favorable eruption of underlying teeth. After 1 month and 9 months, follow-up showed uneventful eruptive movements of the permanent mandibular left premolars (Figs 4 to 7).

DISCUSSION

After radicular cysts, the second most common cysts of odontogenic origin are dentigerous cysts, and they account



Fig. 1: Intraoral preoperative photograph



Fig. 2: Orthopantomograph



Fig. 3: Intraoral postoperative photograph



Fig. 4: Intraoral clinical photograph after 1 month



Fig. 6: Intraoral clinical photograph after 9 months



Fig. 5: Intraoral periapical radiograph taken after 1 month



Fig. 7: Intraoral periapical radiograph taken after 9 months

for about 16.6% of all such jaw lesions. Dentigerous cysts have a comparatively stronger predilection for males and that too in the second and third decades of life,¹⁰ but it has also been reported in younger ages, as in 13 years old female by Shah (1994).¹¹ Male to female predilection ratio for dentigerous cysts happens to be about 1.6:1 and most of them are usually asymptomatic and painless unless infected. However, they could become extremely large and cause cortical expansion and erosion. Therefore, majorities are discovered accidentally on routine radiological examination.¹²

Dentigerous cysts appear to have a greater tendency to cause root resorption of adjacent teeth compared to radicular cysts or odontogenic keratocysts.¹² Cysts developing in the growing child will enlarge much more rapidly than in the adult, and lesions 40 to 50 mm in diameter can develop in a 3- to 4-year period, although patients may only give a history of a slowly enlarging swelling.^{13,14} In an infected cyst, the borders may be ill-defined. There may be difficulty distinguishing a small cyst from a normal tooth follicle. It

has been suggested that any follicular space of >4 mm should prompt a strong suspicion for a dentigerous cyst. However, the differential diagnosis should include ameloblastoma, odontogenic keratocyst, and other odontogenic tumors, such as adenomatoid odontogenic tumor in anterior radiolucencies and ameloblastic fibroma in the posterior jaws of young patients.¹⁵

Cyst arising as a result of periapical inflammation from any source but usually from a nonvital deciduous tooth which spread to involve the follicles of the unerupted permanent successors, the inflammatory exudates causing separation of the reduced enamel epithelium from the enamel with resultant cyst formation. This proposes the existence of two types of dentigerous cysts, one developmental and the other inflammatory in nature. Considering the decayed teeth which were later filled with root canal filling material, the inflammation from the decay deciduous teeth in our case we take an inflammatory origin of the cyst formation.

Treatment of dentigerous cyst depends on size, location and disfigurement; often requires variable bone removal to ensure total removal of the cyst, especially in case of large ones. If the size of cyst is small, it can be enucleated, but marsupialization may be needed for the complete removal of a large cyst. Every effort should be made to allow the involved tooth to erupt, provided the path of eruption is favorable. In a young patient, when preservation of the teeth is most desired and where the lesion is isolated, marsupialization remains the treatment of choice. Recurrence of a dentigerous cyst is rare and could be due to residual fragments of cyst lining, thus warranting thorough irrigation and complete debridement.^{16,17}

Marsupialization or decompression is a technique that attempts to relieve intracystic pressure through the creation of an accessory cavity.⁵ This technique was selected in our case since it is a comparatively conservative intervention and allows the smooth eruption of developing permanent tooth. The choice seemed to be more sensible considering the proximity of the lesions to the buds of developing permanent teeth. Hyomoto et al (2003) found that marsupialization assisted natural eruption of the implicated tooth in dentigerous cysts, in 72.4% of cases and they thus suggest that in pediatric patients it should be considered as first line of treatment.¹⁸ Scott-Brown (1997) has stated that marsupialization of the cystic lining is the treatment of choice for dentigerous cyst in children, in order to give a chance for the unerupted tooth to erupt.¹⁹

Radiologically well-defined radiolucent lesions with sharp margins occurring in the maxilla and mandible may be odontogenic or nonodontogenic in origin, such as radicular cysts, odontogenic cysts, odontogenic keratocyst, nonodontogenic cysts such as simple bone cysts, aneurysmal bone cyst, Stafne cyst, or even tumors such as ameloblastoma. Thus, it is essential to differentiate these lesions from dentigerous cyst on basis of clinical, radiographic and histopathological features. The differentiating features are as under.²⁰

We should always remember that in child patients, healing of the postsurgical osseous defects are always good and thanks to their robust propensity for bone regeneration. This point was further reiterated by the present case and is quite evidently noticeable on the follow-up radiographs.

CONCLUSION

Management of odontogenic lesions, such as dentigerous cysts in children, presents an unparalleled challenge to general and pediatric dentists alike. Coupled with the need for appropriate behavior management and delicate balance

between the primary and the developing permanent dentitions, warrant a highly meticulous approach on the part of every clinician involved in providing dental care to such child patients. A thorough understanding of the nature of the lesion backed by good clinical history and state-of-art radiography can go a long way in helping the clinician to arrive at the correct therapeutic choice of approach, so as to alleviate the problem and ameliorate the condition in the best long-term interests of the young patient.

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