

Dentigerous Cyst Mimicking Radicular Cyst during Primary Dentition Period – A Diagnostic Dilemma

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Abstract

Dentigerous cyst is the second most common cyst in oral cavity after periapical cyst associated always with crown of an unerupted tooth. Etiology of dentigerous cysts may be developmental or as a result of inflammation from pulpal necrosis of primary teeth. Inflammatory dentigerous cysts are common in succedaneous teeth because they occur in response to pulpal necrosis arising from primary molars. This type of dentigerous cyst is commonly seen during mixed dentition but in the present case we present dentigerous cyst seen during primary dentition period. Furthermore, during primary and mixed dentition periods inflammatory dentigerous cysts are often confused with radicular cyst due to its similar clinical and radiographic features. With this case, authors highlighted certain points to differentiate dentigerous cyst from radicular cyst.

Keywords: Dentigerous cyst, Mixed dentition, Primary tooth, Radicular cyst.

INTRODUCTION

Dentigerous cyst arises due to the accumulation of fluid between reduced enamel epithelium and crown of unerupted tooth.^[1] Dentigerous cyst with no bony component is referred to as eruption cysts. Inflammatory dentigerous cyst is a type of dentigerous cyst that is found in relation to successor teeth having pulpally involved primary teeth. Periapical inflammation resulting from pulpal necrosis in primary teeth can act as an etiological factor for the development of dentigerous cyst in successor teeth.^[2] Dentigerous cysts cause a variety of problems such as swelling due to bony expansion, impaction of involved teeth, and displacement of adjacent teeth and structure and; are sometimes associated with neoplastic transformation.^[1,3,4] Due to the tendency for dentigerous cysts to expand rapidly, they may cause tooth displacement, pathological jaw fractures, and other pathologies.^[3]

Early detection of dentigerous cyst is possible if routine radiographic examinations are done for children during eruption phases (childhood) to detect any alterations in tooth development.^[4] Any variations should be noticed with caution and followed up to prevent pathologies at their initial stages. In children, conservative treatment like marsupialization treatment is undertaken for dentigerous cyst because of its (a)

least invasiveness, (b) preservation of tooth, and (c) potential for tooth to erupt into oral cavity.^[5]

CASE REPORT

A 5-year-old male child patient was accompanied with parents with a complaint of swelling in the lower right back region of face since a year. History of presenting illness as narrated by his mother patient was apparently normal 1 year back until he experienced intermittent pain in the lower right back teeth region which was relieved by self-medication. Then, 8 months before his mother noticed swelling in the lower right half of face along with pain which was sharp shooting and continuous, again patient took medications and both pain and swelling were relieved. Patient was asymptomatic in between duration. But 7 days before experienced pain and swelling in same region associated with mild pyrexia. Lymph nodes examination

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revealed right submandibular lymph node which was palpable and slightly tender, solitary in number, roughly oval in shape, soft-firm in consistency, and not fixed to underlying structure.

On extraoral inspection, diffuse solitary swelling was seen on the lower right side of face causing significant facial asymmetry (Figure 1). Swelling measured approximately 2 cm × 1.5 cm. Overlying and surrounding skin appeared normal with no discharge. On palpation, swelling was bony hard in consistency, slightly tender, and mild rise in temperature. On intraoral hard tissue examination, Grossly decayed 84, decayed 74, 85. Soft-tissue examination revealed diffuse, solitary swelling was seen on the mandibular right posterior region, measuring approximately 3 cm × 2 cm, color was same as surrounding mucosa, surface was smooth. Surrounding mucosa was normal. Swelling extent was anteroposteriorly from the mid-canine region to mid-primary 2nd molar and superoinferiorly from alveolar ridge up to buccal vestibule, causing obliteration of the right buccal vestibule, no visible pulsation and no discharge seen (Figure 2). On palpation, swelling was slightly tender and bony hard in consistency



Figure 1: Lateral view of face suggesting swelling of the lower part of face



Figure 2: Intraoral view suggesting large expansile swelling in the lower right jaw

with egg-shell crackling at certain regions, non-mobile, no pulsation, and no discharge.

We have made provisional diagnosis infected radicular cyst in relation to 84 with differential diagnosis of chronic peripheral-periapical granuloma i.r.t. 84, dentoalveolar abscess i.r.t. 84, dentigerous cyst i.r.t. 44, and garre's osteomyelitis of mandible. Aspiration of fluid was carried out to analyze before treatment was contemplated. Fluid analysis showed yellow, straw colored fluid, and few inflammatory cells. Higher protein content was seen in fluid. IOPA and OPG revealed a solitary well defined unilocular radiolucency encircling cemento-enamel junction of unerupted crown of 44 and encroaching apex of 84. The radiolucency was noncorticated. The follicular lining of both 43 and 45 appears to maintain normal continuity (Figures 3 and 4). Occlusal radiography revealed unilocular radiolucency with marked expansion of buccal cortical plate without any radiographic evidence of discontinuity of cortices. There was severe buccal displacement of tooth bud of 44 and 43 is displaced more buccally and anteriorly (Figure 5). Based on clinical, radiographic and fluid analysis a diagnosis of infected dentigerous cyst was ascertained. Infected type of dentigerous cyst in relation to 44 and grossly decayed 84.

Treatment rendered after informed consent and evaluation to undergo a surgical procedure, extraction of teeth 84

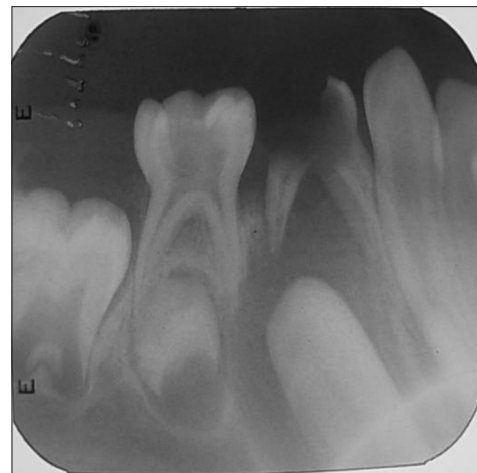


Figure 3: Periapical view suggestive of radiolucency at apex of the lower first molar



Figure 4: Orthopantomograph depicting the extent of swelling and relation of tooth bud

was performed. Later the mucoperiosteum was reflected in a more vestibular direction to expose the cystic cavity. The cyst wall was excised and the cystic contents were drained (Figure 6). The cystic wall was preserved to be sent for histopathology to confirm the diagnosis. Sutures were placed. Postoperatively, the patient was followed up for other treatments such as pulpectomies and restorations. Since the age of the child was less and eruption of 44 would occur very late, a space maintainer was constructed in the edentulous site for future guidance of 44 (Figure 7). Patient will be under constant supervision till the eruption of 44, if necessary orthodontic treatment will be contemplated if required.

Histopathology reports show cystic lumen lined by a thin non keratinized stratified sq. Epithelium, underlying connective tissue wall is fibrocellular with endothelial lined vascular spaces. Few inflammatory cell infiltrate and macrophages suggestive of infected dentigerous cyst (Figure 8). So based on histopathological report final diagnosis was made infected dentigerous cyst i.r.t 44.



Figure 5: Mandibular occlusal view suggestive of expansile lesion and displacement of premolar tooth bud

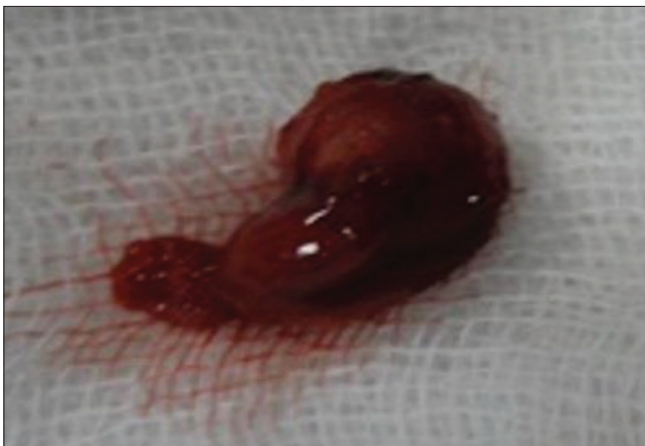


Figure 6: Extraction of primary tooth and marsupialization of cystic wall

DISCUSSION

Etiology of dentigerous cysts may be developmental or as a result to inflammation from pulpal necrosis of primary teeth.^[1,6] Both the variants are seen during 1st and 2nd decade of life; especially during the transition from mixed dentition period to permanent dentition. Dentigerous cysts accounts for approximately 24% of all jaw cysts.^[7] Males have more predilection than females. No predilection for a specific race or ethnicity. More commonly found in mandible than maxilla.^[8] Etiology of developmental variant of dentigerous cyst occurs due to unknown etiology. They are always associated with an unerupted tooth. The commonly involved teeth are 3rd molars followed by maxillary canines.^[9] In contrast, etiology of inflammatory variant of dentigerous cysts occurs in response to pulpal necrosis of primary molars; infection/inflammation from pulpal necrosis can trigger formation of hyperplastic follicle. The commonly involved teeth are premolar and incisors (succedaneous teeth).^[2,6,10] Both type of dentigerous cyst is commonly seen during mixed dentition but in the present case, dentigerous cyst was seen during primary dentition period.

Inflammatory dentigerous cyst can mimic radicular cyst during primary and mixed dentition period causing a diagnostic dilemma for the clinician.^[11] Inflammatory dentigerous cysts are often confused with radicular cyst due to its similar clinical and radiographic features. The etiology of radicular cyst is result of persistent pulpal inflammation from an infected tooth.



Figure 7: Post-operative view indicating healing and rehabilitation by placement of band and loop space maintainer

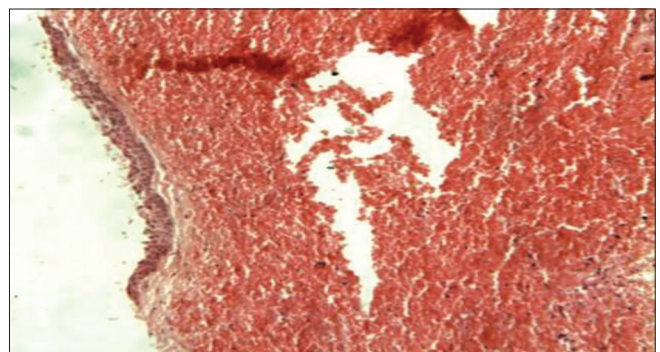


Figure 8: Histopathology of cyst

Similarly the etiology of inflammatory dentigerous cyst is the same, namely, persistent inflammation due to endodontically involved primary teeth.

A radicular cyst can be easily differentiated if it is involving erupted permanent teeth.^[12] However, a radicular cyst cannot be differentiated from dentigerous cyst involving primary teeth easily because the patient has same clinical and radiographic features.^[13] The common features are – patient shall complaint (a) of pain arising due to presence of endodontically involved teeth, (b) clinically there may be presence of swelling, (c) tenderness with respect to involved teeth, and (d) radiographically – there may be presence of large radiolucency in relation to apex of endodontically treated teeth and coronal portion of succedaneous teeth. However, certain points can always distinguish a dentigerous cyst during primary dentition and mixed dentition period from a radicular cyst which are – (a) swelling of dentigerous cyst may cause marked expansion of both the cortices (characteristics of expansile mass) in contrast to radicular cyst, (b) radicular cyst cause perforation of the cortices giving “cyst in cyst appearance” (characteristic of spreading infections) in contrast to which dentigerous cyst causes thinning of cortex giving “egg shell crackling,” (c) radiographically the cyst appears unilocular with well-defined margins and often sclerotic borders, (d) infected radicular cysts show ill-defined margins in contrast to dentigerous cyst, (e) dentigerous cyst because of expansile nature can cause displacement of adjacent teeth and important structures which can be distinguished clinically or radiographically, (f) aspiration of cystic fluid shows pus in radicular cyst while the cystic contents in dentigerous cyst show straw color fluid, (g) however, the most confirmatory test is the histopathology test, and (h) nowadays use of immunohistochemistry is proving to be a more precise test for differentiating lesions.^[14,15]

Clinically, for a practitioner, it is important to differentiate a dentigerous cyst from radicular cyst because (a) dentigerous cyst develops from follicular epithelium hence has more potential for growth, differentiation, and degeneration than a radicular cyst, (b) persistent dentigerous cyst on stimulus can lead to other complications like mural variety of ameloblastoma, and (c) treatment for radicular cyst and dentigerous cyst are quite different.^[16]

Treatment for radicular cyst in primary teeth varies from endodontic treatment to extraction of teeth along with cyst enucleation; in conjunction with systemic antibiotic therapy.^[17] For inflammatory dentigerous cyst, treatment would be extraction of primary teeth followed with marsupialization of cystic wall of succedaneous teeth. Marsupialization allows removal of pressure from expanding cyst thus preventing cyst enlargement and opening provide a path for eruption of tooth. Failure to marsupialize can lead to persistence of lesion. Hence, care should be taken to distinguish a radicular cyst and an infected dentigerous cyst in children and treat accordingly.^[2,5,6]

In present case, proper diagnosis was attained due to careful clinical examination of swelling (expansile cortices with egg shell crackling) along with radiographic investigations using periapical, panoramic and occlusal radiographs (expanding cortex radiographically and displaced tooth bud), analysis of cystic fluid before contemplating treatment, and lastly the histopathology- all suggesting an inflammatory type of dentigerous cyst. All these enabled proper diagnosis of inflammatory dentigerous cyst in contrast to commonly occurring radicular cyst.

Patient was treated appropriately by extracting the primary teeth, marsupializing the cystic wall. Also a space maintainer was given for the patient keeping in mind- (a) age, (b) amount of tooth formation, and (c) eruption status of the child. The teeth shall be supervised periodically for self-eruption or else an orthodontic treatment shall be carried out at a later stage if required.

CONCLUSION

Inflammatory dentigerous cyst can mimic radicular cyst during primary & mixed dentition period due to its similar clinical & radiographic features causing a diagnostic dilemma for the clinician. Dentigerous cyst during primary dentition and mixed dentition period from a radicular cyst which are- a) swelling of dentigerous cyst cause expansion of cortices, b) radicular cyst cause perforation of the cortices c) radiographically the cyst appears unilocular with well-defined margins sclerotic borders, d) infected radicular cysts shows ill-defined margins in contrast to dentigerous cyst, e) dentigerous cyst because of expansile nature can cause displacement of structures, f) aspiration of cystic fluid, g) confirmatory test is histopathology and immunohistochemistry. A few important factors in deciding treatment- Age, Stage of tooth development, Position of tooth, tooth bud inclination, Eruption potential, Space availability, Damage to adjacent structures.

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