Inflammatory Dentigerous Cyst in mixed dentition: a rare sequelae of incomplete endodontic treatment of a primary molar

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Abstract

Endodontic treatment is a frequent procedure in deciduous dentition due to a high of caries in children. Deciduous teeth require restorations and even endodontic treatment in order to render the dentition in a non-infectious healthy state. Nonetheless many times situation becomes complicated. An inflammatory dentigerous cyst is one such condition, occurs usually in mixed dentition period and differs from developmental variety. Periapical inflammation in pulpally involved deciduous teeth may lead to development of an inflammatory dentigerous cyst in the unerupted permanent successor, creating a dilemma for the treatment. This case report intends to throw light on a rare complication i.e. inflammatory dentigerous cyst associated with failed endodontic treatment of second deciduous molar along with its management. Also this case report emphasizes the importance of sterilization of root canal system of deciduous teeth for complete resolution of periradicular as well as periapical infections. Routine radiographic examinations and follow up visits are equally important.

Key Words: *Dentigerous cyst, Endodontic treatment, Enucleation, Inflammatory dentigerous cyst, Mixed dentition*

Introduction

Although effective methods are known for prevention and management of dental caries, it is a major health problem affecting children, in that its manifestations persist despite treatment. A carious tooth requires restorations and even endodontic treatment in order to render the dentition in a non-infectious healthy state. Nonetheless many times situation becomes complicated and creates a dilemma for the treatment particularly in mixed dentition. Inflammatory dentigerous cyst is one such rare condition which differs from the developmental dentigerous cyst wherein the treatment needs to be planned cautiously.

Shafer[1] defined dentigerous cyst as an odontogenic cyst that surrounds the crown of an impacted tooth; caused by fluid accumulation between the reduced enamel epithelium and the enamel surface, resulting in a cyst in which the crown is located within the lumen. Nonetheless the literature provide evidence of dentigerous cyst to be of two types- Developmental and Inflammatory.[2,3,4,5]

Inflammatory dentigerous cysts mainly occur in first decade of life during the mixed dentition period. This kind of cysts are often caused by deciduous periapical inflammatory lesions that spread to the successors' follicle, causing fluid accumulation between the reduced enamel epithelium and enamel leading to separation between the two.[3]

This article intends to present a rare case of inflammatory dentigerous cyst associated with unerupted mandibular right second premolar (45) in conjunction with endodontically treated deciduous mandibular right second molar (85) along with its manifestations and management.

Case report

A 9 year old male patient reported to the department of Pedodontics and Preventive dentistry, Modern Dental College and Research Centre, Indore, with a complaint of a hard swelling in the lower right posterior tooth region which was not associated with any pain. The patient was apparently healthy on general examination and had no history of systemic diseases. Dental history

revealed that the patient had undergone an endodontic treatment in the same region 1 year back.

On extra-oral inspection the swelling was unremarkable which on palpation was firm in the region of mandibular right posterior teeth. Intraorally, a firm non-tender swelling was present in the vestibular region with respect to 84 and 85 (Fig. 1). However there was no mobility or tenderness with respect to these teeth. The patient was in mixed dentition period with erupted lower and upper permanent first molars and incisors. Patient was advised for a mandibular occlusal and an IOPA radiograph of 84 and 85 region.

The IOPA radiograph revealed a single, unilocular, well-defined, radiolucent area encircling the crown of 45 involving the roots of 85 (Fig. 2). The 85 was endodontically treated with the evidence of root resorption. Occlusal radiograph did not show any expansion of cortical bone in 85 region (Fig. 3).

On the basis of radiographic and clinical findings, a provisional diagnosis of inflammatory dentigerous cyst in relation to the unerupted 45 involving endodontically treated 85 was made.

After taking the informed consent from the parents, extraction of 85 was planned under local anaesthesia. Antibiotics and analgesics were started one hour before surgery to be continued till five days.

After anesthetizing the right half of the mandible with an inferior alveolar nerve block, the cystic content was aspirated with a thick bore needle. On aspiration, brown colored fluid was obtained from the cystic swelling (Fig. 4). The swelling reduced as soon as the fluid was aspirated. Following aspiration the 85 was extracted and the area was debrided until the crown portion of the unerupted premolar was visible (Fig. 5 & 6). The fluid as well as the specimen collected was sent immediately for histopathological examination. The wound was left open. Patient was advised for chlorhexidine oral rinse and to continue the medication for five days.

Histopathological examination showed a thin fibrous wall covered with stratified squamous cells, and the wall was mildly infiltrated with chronic inflammatory cells. The reports confirmed the provisional diagnosis of inflammatory dentigerous cyst.

The patient was recalled after one week of surgery. On recall the surgical wound showed an uneventful healing in 45 area and erupting contralateral 35. A lingual arch space maintainer was planned to maintain the space for smooth eruption of 45. At 2 weeks follow up, a lingual arch space maintainer was inserted in the lower arch. At 6 month follow up, 45 was seen erupting successful in the mouth and therefore the space maintainer was removed (Fig. 8).

Fig. 1: Showing vestibular swelling present in relation to 84, 85

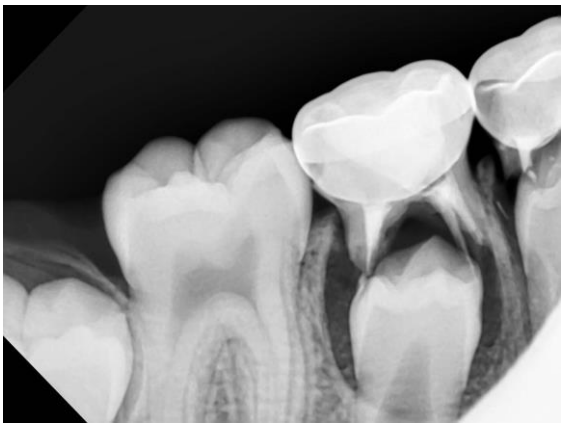

Fig. 2: IOPA showing unilocal radiolucency present encircling the unerupted 45 associated with endodontically treated 85

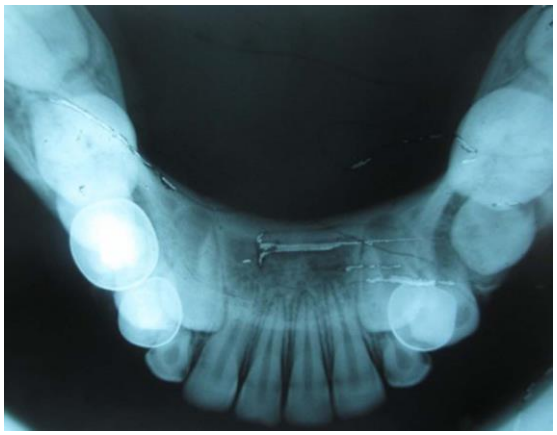

Fig. 3: Occlusal radiograph showing no expansion of cortical plates in 84, 85 area

Fig. 4: Aspirated brown colored cystic fluid

Fig. 5: Extracted 85

Fig. 6: Visible crown portion of unerupted 45 after extraction of 85

Fig. 7: Uneventful healing with respect to 85 region after 1 week recall and erupting 35

Fig. 8: Successful eruption of 45 in the arch

Discussion

An inflammatory dentigerous cyst is one of the variant of dentigerous cyst which is found only

in the mixed dentition period and is mostly associated with an infected deciduous tooth. The cyst is slow growing and if not detected early may have the potential to expand the bone, tooth mobility, displacement of adjacent teeth, mild sensitivity and root deformation of developing permanent teeth.[6] It is thought to develop from the spread of inflammation, present at the root apex of a non-vital deciduous tooth, to the follicle of a developing permanent successor. The expansion of dentigerous cysts is related to a secondary increase in cyst fluid osmolality as a result of passage of inflammatory cells and desquamated epithelial cells into the cyst lumen.

Various text books gave description about the development variant only.[1,7] However, several case reports described another variant of dentigerous cyst i.e. inflammatory dentigerous cyst although difference between the two is difficult. Our Case had existing endodontically treated 85, which raised the possibility of inflammatory dentigerous cyst, later confirmed by the histopathologic report. This case supports Benn et. al.[3] who found that inflammatory dentigerous cyst occurred in the first and early part of the second decades of life; males were affected more than females and the mandible was affected twice as frequently as the maxilla. He also stated that the inflammatory exudate causes separation of the reduced enamel epithelium from the enamel with resultant cyst formation.

Several researchers believed that deciduous teeth with chronic prolonged inflammation in the pulp chamber (or radicular region) due to an infected pulp or incomplete pulpotomy (or root canal treatment) may potentially lead to the development of dentigerous cysts in periapical or periradicular area and considered persisting infection or incomplete treatment a dangerous factor.[3,8,9,10]

In general radiographically, inflammatory dentigerous cysts appears as a round or avoid, well demarcated unilocular radiolucency within the corpus of the mandible. A cyst is usually associated with the roots of a non-vital deciduous tooth and the crown of an unerupted permanent successor. The border is sclerotic.[2,3] But in our case, as shown in the occlusal X-ray the right mandibular buccal cortical plate was not seen expanded (Fig. 3). The swelling was reduced along with aspiration, proving that buccally, the cyst had only mucoperiosteal lining remaining. As thinned buccal cortical plate was seen on contralateral side with developing 35 (Fig. 3), there lies a possibility that already thin cortical plate due to dental follicle of erupting 45 got disrupted with further accumulation of cystic fluid.

This case report provides enough information on whether the observed in dentigerous cyst is a deciduous/secondary phenomenon. As discussed earlier, deciduous periapical inflammatory lesions could spread to the successors' follicle, leading to the formation of inflammatory dentigerous cyst. On the other hand in case of secondary infection of a developmental cyst the cyst need not be associated with an infected predecessor. However, the final diagnosis of inflammatory dentigerous cyst should be based on correlation of clinical, radiographic and histopathological findings.

The treatment options of a dentigerous cyst should be based on the size of the cyst, age of patient, location of the cyst, dentition affected, and relationship with the surrounding structures. Since the development of the cyst is connected with inflammation arising in a non-vital deciduous tooth, removal of the source of inflammation i.e. extraction of the tooth, was logically the basic therapeutic procedure. Children have a better ability to regenerate bone than adults, and teeth with open apices have a large eruptive potential. The extraction of involved deciduous tooth created an accessory cavity which helped relieving intracystic pressure and healing of the cystic lesion was accelerated (Fig. 7). Delayed eruption of 45 compared to contralateral 35 further confirmed cystic displacement of developing 45 towards inferior border of mandible. The correct diagnosis and conservative treatment helped smooth eruption of successor in its position in the in our case, which otherwise would have created many complications *viz.* displacement of involved successor, dilacerations of roots, destruction of bone etc.

Conclusion

This case presented a rare complication of endodontically treated deciduous teeth. Clinician while dealing with the restoration of severely decayed deciduous teeth should take under consideration the adverse side of it. Patient as well as the parents should also be informed about the importance of follow up appointments and regular dental visits. Early diagnosis and a conservative approach is the only treatment which is required in the cases of inflammatory dentigerous cysts. Also this case report emphasizes the importance of

sterilization of root canal system of deciduous teeth for complete resolution of periradicular as well as periapical infections. Routine radiographic examinations and follow up visits are equally important.

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