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Conservative management of dentigerous cyst in mixed dentition: A case report

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Abstract

Dentigerous cysts (DC) are the most common odontogenic cystic lesions of inflammatory origin occurring in children. They are related to the crown of an unerupted tooth. These cysts are usually asymptomatic and often discovered as an accidental radiographic finding in association with an unerupted tooth. Conventionally they are treated by enucleation of the entire lesion. This article presents a case report where a conservative approach was done via marsupialisation. This conservative surgical technique allows simultaneously the normal eruption of the involved permanent teeth and the ossification of the bony defect. This case report describes management of dentigerous cyst in a 9 year old boy where extraction of 75 was done, followed by marsupialisation procedure where cyst cavity opening was kept patent with the help of an acrylic Obturator.

Keywords: Odontogenic cysts, Dentigerous cysts, Marsupialisation, Obturator

Introduction

It was a German surgeon by the name of Scultet in 1671, who put forward the concept of 'liquid tumours'. These were known to cause certain degree of expansion within the jaw bones. "Dentigerous Cysts" (DC) was a term put forth by James Paget in 1853; and earlier it was considered to be broader term which encompasses all the cysts of dental origin^[1]. Several studies have been conducted over time to determine the origin of dentigerous cysts. Now it is considered as synonymous to follicular cyst and is considered as an odontogenic cyst associated with the crown of an impacted, embedded, unerupted or developing tooth. The cyst which usually encloses the crown of the tooth is attached at the cervical margin of the tooth^[2]. It accounts for 20 % of all jaw cysts and around 10 % of impacted teeth are known to manifest this pathology^[3]. Mostly seen in the second or third decades of life, but also seen in children and adolescents during the mixed dentition stage^[4]. Males are slightly more prone to be effected than females^[5]. Mostly they are seen associated with the crowns of mandibular third molars, followed by maxillary canines and maxillary third molars^[6]. Maxillary and mandibular premolars have also been seen to be associated with these cysts. Cases have also been associated with primary dentition^[7, 8]. Dentigerous cysts are often incidental finding in radiographs since they are usually asymptomatic and usually detected when there is an acute exacerbation^[9]. Radiographic appearance is usually a symmetric, well-defined, mostly unilocular radiolucent lesion surrounding the crown of an unerupted tooth. Radiograph generally shows a distinct, dense periphery of reactive bone (condensing osteitis) with a radiolucent center. But these cysts can also be seen as multilocular radiolucencies and occasionally is also associated with resorption of root of adjacent tooth^[10, 11]. The different modalities of treatment employed for dentigerous cysts include: Chemical cautery using Carnoy's solution. Cryotherapy/Cryosurgery liquid nitrogen^[3]. Complete enucleation (Partsch II technique). Marsupialisation (Partsch I technique)^[3] and decompression of the cyst via fenestration^[12].

This case report describes a conservative surgical approach for the treatment of a dentigerous cyst associated with a mandibular second premolar in a 9 year old patient with marsupialisation.

Case Description

A 9 year –old male patient reported to the Department of Paediatric and Preventive Dentistry with chief complaint of swelling on the left side of his jaw since 1.5 month. The swelling had gradually increased in size over the period. There was no associated pain or discharge noted. The overall general physical health of the patient was good and he didn't have any relevant medical history that could be a contraindication for dental treatment.

Extraoral examination revealed a slightly notable swelling on left side of the lower face (Figure 1a). There was no associated pain or discharge. There was no sign of any lymphadenopathy. Intraoral examination revealed mixed dentition. Angles class I molar relation on both sides. A stainless steel crown was noted in relation to left lower mandibular second primary molar. On palpation intraorally a bony hard, non–tender, non fluctuant swelling was noted about 2×2 cm in size extending from the distal surface of the left permanent canine to the mesial surface of ipsilateral first permanent molar (Figure 1 b). Initially an Orthopantomogram (OPG) was taken which revealed the presence of all the permanent teeth. There was a well-circumscribed unilocular radiolucent lesion in the body of the mandible on the left side, which was associated with the crown of impacted second premolar (Figure 2). The associated lower left second primary molar was endodontically treated and rehabilitated with a stainless steel crown but the roots were resorbed to less than half of original length. Aspiration of the swelling with a fine needle revealed a straw colored fluid (Figure 3). On the basis of these findings provisional diagnosis of dentigerous cyst was made with a differential diagnosis of Radicular cyst.

Two treatment options were considered – either to go for complete enucleation of the lesion along with extraction of associated second premolar or to go with Marsupialisation which is a conservative management.

A CBCT was taken to get a better idea regarding the extension of the lesion. The scan revealed unilocular lesion of 18mm× 15 mm extending to the buccal and lingual cortical plate with expansion of buccal cortical plate. Inferiorly the lesion was 5 mm above the inferior border of mandible (Figure 4).

Keeping in mind the extension of the lesion. The age of the patient and as a last resort to save the permanent premolar. It was decided to go for a conservative management. The parents were informed about the chances of needing a second surgical procedure for enucleating the cystic lesion and also the possibility of second premolar extraction.

The deciduous second molar was extracted under local anaesthesia (Figure 5). Following the extraction. The cyst lining was approached via the extraction socket and lining of dimension 3×3 mm was excised and sent for histopathological examination (Figure 6). The cystic fluid was then completely evacuated, and the cavity irrigated with povidone –iodine solution. The impacted tooth was inspected via the extraction socket and it was noted that the premolar was inclined towards the buccal aspect of alveolar ridge. Following this the inner cystic lining was sutured with outer oral mucosal lining to establish a communication between cyst and oral cavity (Figure 7).

Histopathology report confirmed the lesion as inflammatory dentigerous cyst. The cyst wall showed chronic inflammatory cells with an ulcerated squamous lining and rete pegs and Rushton bodies. Consistent with inflammatory dentigerous cyst. Thus confirming the diagnosis. (Figure 8)

Then impression of the cystic cavity was made with

elastomeric impression material and cast was poured with type IV dental stone (Figure 9). An obturator was fabricated with cold cure acrylic material and delivered on the same day (Figure 10). The parents were advised to follow postsurgical instructions, rinsing the cyst opening twice a day with saline and 0.2 % chlorhexidine. During the first month the patient was recalled every week and cavity was thoroughly irrigated with povidone-iodine solution following which patient was recalled monthly. The obturator was slightly trimmed at monthly appointments.

At seventh month review clinically it was noted that bony swelling had completely subsided and premolar had erupted into the oral cavity (Figure 11).

Following this an Orthopantomogram was taken which showed complete healing of cystic cavity with formation of bony trabeculae (Figure 12).

Later it was decided to discontinue the obturator and go for a fixed lingual arch space maintainer (Figure 13).

The parent was informed about the need for long term review to evaluate the vitality and root formation of the premolar.



Fig 1(a): Pre operative Extraoral Image

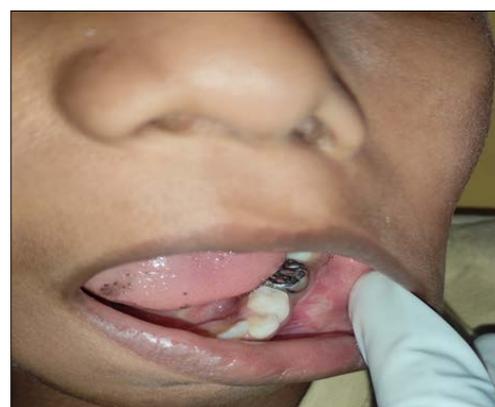


Fig 1(b): Pre operative intraoral image



Fig 2: OPG showing unilocular radiolucent lesion i.r.t 35



Fig 3: Straw colored aspirate fluid



Fig 7: Suturing of inner cyst lining with outer mucosal lining

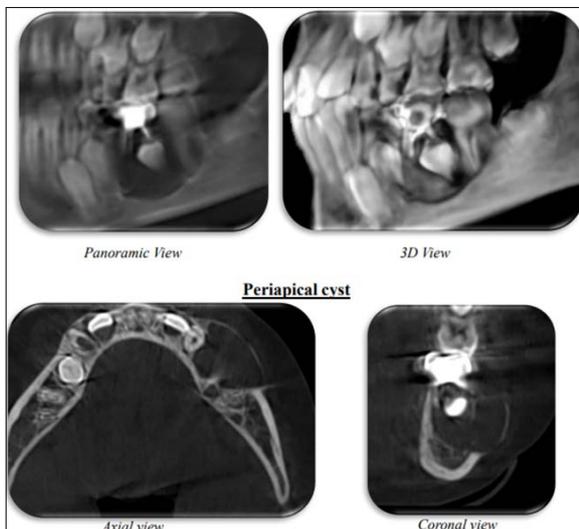


Fig 4: CBCT scan showing unilocular lesion with expansion of buccal cortical plate

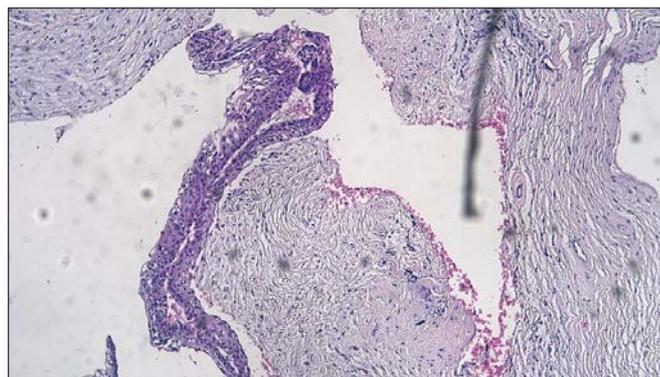


Fig 8: Histopathologic view of the cyst lining



Fig 9: Impression of the lower arch with cyst cavity



Fig 5: Extracted 75



Fig 6: Cyst lining sent for histopathology examination



Fig 10: Obturator delivered



Fig 11: Premolar erupted into oral cavity



Fig 12: OPG showing complete healing of cystic cavity



Fig 13: Fixed space maintainer

Discussion

Benn and Altini classified dentigerous cysts into developmental and inflammatory types. Developmental cysts are usually seen in association with an immature permanent teeth and that too usually associated with mandibular third molar [13]. The inflammatory type, is associated with a developing permanent tooth and is initiated by an infected necrotic primary tooth that in turn cause an inflammatory stimulation in developing tooth follicle [13].

The type of dentigerous cyst in this case was inflammatory type most likely to be originated from non vital endodontically treated lower left second primary molar. Marsupialisation was chosen since enucleation would sacrifice the permanent second premolar and also there is a possibility of compromising the vital structures.

In marsupialisation technique a pouch is created by suturing the cyst lining with oral mucosa lining which allows the provision for direct drainage. But there is a disadvantage and complexity of procedure in that this patency has to be maintained open and thus the window created has to be large.

If window is small. Epithelium may grow over it and close it entirely [14].

Hyomoto *et al.* [15] analysed the factors that interfere in the spontaneous eruption of permanent mandibular molars. He observed that the teeth tend to erupt freely in presence of inflammatory infiltrate, suggesting that larger the quantity of inflammatory cells, the greater the predictability of eruption of the tooth associated with the cyst. He also stated that the angulation and position of the impacted tooth in the alveolar bone were significant factors for eruption. The teeth that had less than 80° of tooth axis angulation or were less than 9 mm deep in bone erupted into the oral cavity. He suggested that the tooth is being brought up in accordance with rapid bone formation in the cyst cavity.

In the present case the angulation of the impacted premolar was less than 80° and also less than 9 mm deep in the alveolar bone. Thus indicating a favourable prognosis and the possibility of completely erupting into the oral cavity with rhizogenesis.

Nakamura *et al.* [17] reported that marsupialisation has to be continued for at least 6 months and if the cyst does not diminish in size surgical removal should be performed.

In this case the cyst diminished in size and showed complete bony trabeculae formation. Thus enucleation was deferred since the present case showed no cystic remnants after marsupialisation. But still a long term follow up is warranted and extraction of premolar may be needed if its development is arrested.

In most of the cases mentioned in literature an iodoform gauze was packed in the cystic cavity. But in the present case since the parent and patient were motivated and already the use of obturator was planned. Parents were educated on how to irrigate the cystic cavity twice on a regular basis. Thus it was decided to avoid iodoform gauze packing and review the patient at weekly intervals for atleast one month. Moreover the Obturator also acted as a space maintainer till the premolar erupted preventing space loss by mesial migration of first permanent molar.

The present case describes a simple. Conservative yet effective approach for the management of dentigerous cyst in children. Without having to undergo a second surgical intervention. Continuous follow up along with parent and patient compliance being an important part of the management approach.

But still a long term follow-up period is indicated with close observation.

Conclusion

The results of this case report supports the assumption that mandibular premolars associated with dentigerous cysts in mixed dentition period are capable of spontaneously erupting into the oral cavity along with complete healing of the cystic lesion. This could be supported by the fact that the children have greater vascularity which favours a greater rate of bone regeneration than in the adults. Also the decompression of the lesion along with root formation of the impacted premolar exerts a force which favours the eruption of the tooth. Marsupialization could therefore be considered as a definitive treatment option for the management of dentigerous cysts in pre-adolescent children.

List of Abbreviations

1. DC – Dentigerous Cyst
2. CBCT –Cone Beam Computed Tomography
3. OPG - Orthopantomogram

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