

A case report of an unusual concurrence of Radicular and Dentigerous Cyst in a 9 year old child

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Abstract

Radicular cysts are most common cystic lesions and the frequent cause of chronic swellings of the jaws. They are rare in primary dentition and originate from epithelial remnants of the periodontal ligament as a result of inflammation that follows pulpal necrosis. Dental caries is most common etiology of the Radicular cyst present in relation to the primary molar. The Dentigerous cyst is defined as odontogenic cyst that surrounds the crown of an unerupted tooth and is caused by the fluid accumulation between the epithelium and the crown of unerupted tooth. These cysts occur predominantly in the mandibular and the maxillary third molar regions and the maxillary cuspid areas as these are the most commonly impacted teeth. Radicular cyst can heal spontaneously after root canal treatment or extraction but the most suitable treatment is complete enucleation of cyst with all the epithelial remnants along with the extraction of the primary tooth. The recommended treatment for Dentigerous cyst in children is marsupialisation to conserve the permanent tooth and provide a chance to erupt. Some authors suggest the complete removal of the associated tooth and enucleation of the pericoronal soft tissue as a definitive therapy. Both the Radicular and the dentigerous cysts are the most common of all jaw cysts and very rarely both of them are seen in a patient at the same time.

This article presents a case report of a 9 year old child patient having Radicular cyst associated with first primary molar and Dentigerous cyst in relation to second premolar on the left side of mandible.

Keywords: Radicular cyst, Dentigerous cyst, Enucleation, marsupialisation

Introduction

Radicular cysts are most common cystic lesions and the frequent cause of chronic swellings of the jaws.^(1,2) They are rare in primary dentition and originate from epithelial remnants of the periodontal ligament as a result of inflammation that follows pulpal necrosis.^(3,4) Radicular cysts are relatively rare in primary dentition because of the distinct biological cycle of the primary teeth^(3,4,5) and rarely seen before the age of 10 years.⁽¹⁾

Mostly the Radicular cysts seen in primary dentition are found in association with the mandibular molars^(2,4,6) and Dental caries is most common etiology of the Radicular cyst present in relation to the primary molars.^(2,3,5,6) The Dentigerous cyst is defined as odontogenic cyst that surrounds the crown of an unerupted tooth and is caused by the fluid accumulation between the epithelium and the crown of unerupted tooth.^(7,8) These cysts occur predominantly in the mandibular and the maxillary third molar regions and the maxillary cuspid areas as these are the most commonly impacted teeth.^(7,9,10) They generally appear during the development of tooth and has low frequency of occurrence in children.⁽⁹⁾ After the Radicular cyst, the Dentigerous cyst is the most common odontogenic cyst and the most common development cyst of the jaws^(7,11,12,13,14) and they are detected incidentally during the routine radiograph of the patient.⁽⁸⁾ Radicular cyst can heal spontaneously after root canal treatment or extraction but the most suitable treatment is complete enucleation of cyst with all the epithelial remnants

along with the extraction of the primary tooth.^(2,8) The recommended treatment for Dentigerous cyst in children is marsupialisation to conserve the permanent tooth and provide a chance to erupt.^(8,9,10) Some authors suggest the complete removal of the associated tooth and enucleation of the pericoronal soft tissue as a definitive therapy.^(11,12) Enucleation of Dentigerous cyst reduces the possibility of leaving any potentially dangerous residual cells that can result in recurrence of cyst, ameloblastoma or other such lesions which will makes future management strategies more complex and increases the risk of pathological bone fracture.^(12,15)

Both the Radicular and the dentigerous cysts are the most common of all jaw cysts and very rarely both of them are seen in a patient at the same time.⁽⁸⁾

This article presents a case report of a 9 year old child patient having Radicular cyst associated with first primary molar and Dentigerous cyst in relation to second premolar on the left side of mandible.

Case Report

A 9 year old healthy boy reported to the department of Pediatric Dentistry, with a chief complaint of pain and a swelling in relation to the lower jaw on left side since 1 month. There was no fever associated. Externally a firm hard and well defined swelling was felt on the body of the mandible that extended to the lower border of the mandible. There was no warmth and discoloration of the overlying skin of the cheek. The intra oral examination showed the presence of firm, hard swelling extending along the

buccal vestibule from first primary molar to the second primary molar. The primary molars in vicinity of the swelling were deeply carious with no sinus formation and mobility. (**Fig. 1**) IOPA radiograph revealed pulpal involvement in first primary molar and perforations and root resorption in relation to second primary molar. A large well defined radiolucency was noted around roots of primary molars. OPG revealed a well defined radiolucency areas measuring approximately $3.5 \times 1 \text{ cm}^2$ involving the apex of 74 and 75. In the radiograph it was also found that II PM i.e. (35) to be pushed to an ectopic position abnormally within the radiolucency mesially. The patient was advised a **Cone Beam CT Scan**. The scan revealed an expansile lesion measuring $4.2 \times 1 \text{ cm}^2$, leading to the expansion of buccal and lingual cortical plates which was also pushing the II PM i.e. 35 towards the lingual cortex. (**Fig. 2**) The patient was referred to the Dept. of OMFS where an FNAC from the lesion was carried out which showed pale straw colour fluid. The patient was explained about the possibility of cysts and enucleation was planned. Since the patient was cooperative hence treatment was planned under L.A.



Fig. 1: Pre-Operative OPG Radiograph



Fig. 2: CT Scan View-Cofirming the presence of Radicular and Dentigerous Cyst

mandibular vestibule & flap was reflected which confirmed the thinning out of the labial cortex. Cystic fluid was evacuated & the lining was excised completely along with the removal of II PM (35). The samples were sent for Histopathological examination in 2 separate bottles. 1st bottle contained the hard and soft tissues associated with the roots of 75 and 2nd bottle contained the hard and soft tissues associated with unerupted 35. (**Fig. 3**) The first bottle stained section showed fibrous connective tissue wall with dense chronic inflammatory infiltrate and blood vessels. Some areas showed the presence of stratified squamous epithelial lining.



Fig. 3: CT Scan View

The second bottle section revealed a thin epithelial lining, two cell layers in thickness. The connective tissue wall was found to be composed of delicate fibro cellular connective tissue interspersed with small epithelial islands of odontogenic origin. All these histological findings were suggestive of the presence of Radicular cyst in relation to 75 and Dentigerous cyst associated with unerupted 35. (**Fig. 4, 5**)



Fig. 4: Post operative -4 weeks

Treatment: After administration of LA a crevicular incision was taken along the 73 to 36 area in the



Fig. 5: Post operative OPG - 6 months

The area was irrigated with mixture of saline and betadine. Closure of wound was done by resorbable sutures. A betadine soaked pack was placed inside cavity that was removed after 48 hours. The patient recovered uneventfully

A fixed space maintainer-band & loop was given (2 weeks later) so as to prevent the space loss and mesial migration of permanent molars and fixed prosthesis was planned for later rehabilitation of the missing tooth region.

The patient was examined on a clinical follow up after 7 days, 3 and 6 months and after one year and still on regular periodic evaluation. (**Fig. 6**)



Fig. 6

Discussion

Odontogenic cysts are the most common degrading lesions of the jaws which are broadly classified into developmental and inflammatory types on the basis of etiology.⁽⁸⁾ Radicular cysts are inflammatory in origin and are by far the most common odontogenic cyst of the jaws whereas Dentigerous cysts are the most common type of developmental cysts.^(4,7,13)

Radicular cysts occur in the interradicular or periapical area of any teeth and are infrequently associated with the deciduous dentition.^(5,6,7) as Radicular cysts originating from the primary teeth are considered to be rare.^(4,6) and uncommon to find before the age of 10 years.⁽¹⁾ These cysts arise from the epithelial residues of the periodontal ligaments as a result of the inflammation that follows the pulpal necrosis following dental caries.^(3,4,7) Although Dental Caries is the most

common etiologic factor in the formation of the cysts,^(3,5) but they may also be a result of traumatic injuries to primary teeth and improper restorations.^(2,7) Most Radicular cysts develop slowly and do not become larger cavities⁽⁸⁾ and like other cysts of the jaws result in slowly progressive painless swellings which in majority of cases are asymptomatic.^(1,7)

Dentigerous cysts are always associated with the crown of an unerupted, impacted tooth or dental anomaly such as odontome or a supernumerary tooth.^(7,16) These cysts are also uncommon in children and most often found in ages between 20 to 50 years.⁽¹⁾ These type of cysts develop during the tooth development stages after the deposition of enamel resulting probably due to degenerative changes in the reduced enamel forming epithelium.^(9,16) The attachment of the cyst lining at or near the cemento-enamel junction suggests that dentigerous cysts arise as a result of cystic change in the remains of the enamel organ after enamel formation is complete.⁽⁴⁾

This case report presents a rare occurrence of presence of Radicular cyst with a primary mandibular molar and at the same time presence of dentigerous cyst with unerupted mandibular second premolar on the same side.

The most suitable treatment options for Radicular cysts include total enucleation in the cases of small lesions and marsupialisation for larger cysts, or a combination of the two techniques.^(2,3,8) There are many clinicians who are of opinion that a great majority of cystic lesions which are less than 1cm in diameter can heal after root canal treatment and advise to wait for 1 year to assess healing and proceed to surgical intervention only if there is no resolution of pathology.⁽⁸⁾ The success of treatment also depends upon patient's cooperation and regular radiographic evaluation. The size of cyst surrounding the primary molar in our patient was approximately 3.5X1cm² and hence enucleation of cystic lining along with the extraction carious molar was done successfully.

The recommended treatment for Dentigerous cysts involving unerupted and favorably positioned teeth is marsupialisation as this will conserve the tooth and also lead to smooth eruption of the underlying tooth.^(8,9,17) However the major disadvantage of marsupialisation is that pathologic tissue is left in situ without a thorough histological examination.^(8,10) In cases of longstanding larger lesions and unfavourably positioned unerupted teeth; enucleation of the cyst along with the offending tooth is the Gold standard.⁽¹⁷⁾

In our case, cystic sac was surrounding the unerupted premolar and was firmly attached to it and also the unerupted premolar pushed abnormally in the mesial direction. So, the favourable option was enucleation of the cyst along with the removal of the displaced tooth i.e. II premolar. The patient was examined on a clinical follow up after 7 days, 3 and 6 months and after one year. During follow up intra oral

healing was found to normal and uneventful and no evidence of bone resorption or recurrence of radiolucency was observed and also the patient was advised longer follow up periods A fixed space maintainer-band and loop was given so as to prevent the space loss and mesial migration of permanent molars and fixed prosthesis was planned for later rehabilitation of the missing tooth region.

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