Treatment of large radicular cyst of lower jaw in children- A report of two cases

Dr. Jyoti Mathur  M.D.S.
Dr. Bhumi Sarvaiya  M.D.S.
Dr. Dipal Sharma  B.D.S.

Abstract:
Radicular cysts are the most common odontogenic cystic lesions of inflammatory origin and managed either by surgical enucleation or marsupialization. However, radicular cysts are rare in the primary dentition wherein most of times dentigerous cysts are encountered. The possibility of complete healing of large cystic periapical lesions of lower jaw in mixed dentition with conservation of vital structures has been illustrated. This article aims to report two cases of large radicular cysts of huge proportion in the mandible treated with marsupialization.

Keywords: Radicular cyst, Marsupialization, Mixed dentition period

Introduction:
Radicular or residual cysts, also called as periapical cyst, are the most common odontogenic cysts of teeth bearing areas. Radicular cysts are rare in primary dentition, and represent only 0.5 to 3.3% of the total number of radicular cysts in both the primary and permanent dentition12. These arise from epithelial rests of Malassez in periodontal ligament as a result of inflammation. Most radicular cysts seen in the primary dentition are associated with mandibular molars3. With regards to treatment approach, two techniques can be used: enucleation and marsupialization. Enucleation is the process by which the total removal of the cystic esion is achieved4. There is a possibility that enucleation might cause the devitalization of many healthy adjacent teeth. In case of a large cystic lesion in mandible, enucleation might weaken the jaw so that fracture could be inevitable. Marsupialization, decompression and Partsch's operation all refer to creating a surgical window in the wall of the cyst, evacuating the contents of the cyst, and maintaining continuity between the cyst and oral cavity5. This process decreases intracystic pressure and promotes shrinkage of the cystic cavity and filling by bone.

In children the jaw is in the process of growth and development and the dentition is in a continuous state of change, with the eruption and resorption of primary teeth and eruption of permanent teeth taking place simultaneously. Any interference with growth centers in the jaw or premature extraction of primary teeth may lead to malformation of the jaw, the permanent teeth or both. In a mixed dentition, several odontogenic developmental processes take place, hence, the surgical technique of choice should be the one with the least likelihood of iatrogenic damage6. The cases presented here describe the management of large radicular cyst in children with mixed dentition treated with conservative approach of marsupialization.

Case reports
Case one:
A 10 year old male patient reported to the Department of Pedodontics and Preventive dentistry Faculty of Dental Science, D.D.U. Nadiad with chief complaint of painless swelling which was enlarging gradually in lower left posterior region of the jaw, present since 3 months and leading to facial asymmetry. On general examination, sclera was yellowish, as hepatitis C was diagnosed one month back. There was no other bony lesion or defect present in the body or no history of trauma of the jaw. On extra oral examination, facial asymmetry was noted on left side with no sinus or active discharge of pus. The left submandibular lymph nodes were enlarged, palpable, tender and mobile which suggested chronic infection from the tooth. Swelling

Address for Correspondence:
Dr. Jyoti Mathur  M.D.S.
Department of Pedodontics and Preventive Dentistry, Faculty of Dental Science, Dharmsinh Desai University, NADIAD-387001, GUJARAT.
Ph: 079-26589498  Email:drjyotimathur74@gmail.com

JOURNAL OF DENTAL SCIENCES
Volume 4  Issue1
was bony hard and no crepitus was present. Intra oral examination revealed a grossly decayed tooth 75 with considerable expansion of buccal cortical plate in the primary second molar and permanent first molar region with obliteration of buccal vestibule. There was no intraoral sinus or active pus discharge present. Panoramic radiograph revealed grossly carious tooth 75 with a single well defined periapical unilocular radiolucency about 3x2 cm in size extending from 74 to 36 anteroposteriorly and displacement of the 35 tooth bud to the lower border of mandible. Only a very thin margin of lower border of mandible was present. (Illustration 1a).

![Illustration 1a: Pre-operative radiograph](image)

The case was posted for marsupialization of the lesion. It was decided to create a window through the extraction socket of 75, allowing continuous drainage of the cystic content. FNAC of the lesion showed the acute inflammatory cell infiltrate mainly consisting of neutrophils, lymphocytes, and cholesterol crystals. Thus, the diagnosis of a radicular cyst was confirmed. The cystic cavity was irrigated with povidone iodine solution and packed with gauze dipped in iodoform which was changed two times a week for one month. Chlorhexidine mouthwash was prescribed. After one month, a non functional removable space maintainer with acrylic plug was given to prevent food lodgment (Illustration 2a).

![Illustration 2a: Non functional removable space maintainer with acrylic plug](image)

Follow-up radiographic examination revealed the following- after 1 month: there was slight occlusal movement of the developing tooth bud, but there was no apparent reduction in the radiolucency.

After two months of treatment, there was presence of pus in cystic cavity and pain on percussion was present in 36, indicating periapical pathology. Root canal treatment was done in 36 thus rendering it asymptomatic. The iodoform gauze was changed once a week thereafter. It was stopped after the cavity was filled with bone. Acrylic plug of the space maintainer was gradually trimmed to allow the eruption of premolar.

Follow up examination in OPG after 11 months revealed that there was further occlusal movement of the second premolar (partially erupted) and there was almost complete reduction in the radiolucency. The root formation of mandibular left second premolar progressed to one third, same as the contralateral premolar, indicating normal chronological development of the tooth. Some change in the shape of the developing root was noted but it would be of no clinical consequence if the tooth continues to develop and erupt normally (Illustration 4a).

![Illustration 4a: 11 months post-operative](image)

After 1 year, on extra oral examination, the bony hard swelling had subsided and facial symmetry was present. On intraoral examination the second premolar was partially erupted, no bone defect was found and buccal vestibule depth was normal (Illustration 5a).

![Illustration 5a: 1 year post-operative](image)
ase two:
A 7 year old male patient reported to the Department of Pedodontics and Preventive dentistry Faculty of Dental Science, D.D.U. Nadiad with a chief complaint of painless swelling both intraoral and extraoral in lower right posterior region of the jaw since 4 months which increased gradually and having no sinus formation or pus discharge. As in case one, the right mandibular lymph nodes were tender, enlarged, and palpable, suggestive of chronic infection present in relation to a tooth. Swelling was bony hard, non tender and no crepitus was present. Intra oral examination revealed grossly carious teeth in relation with 75 and 84, 5. The swelling extended from 83 to 85 obliterating the buccal vestibule. There was no presence of intraoral sinus or pus discharge. The Orthopantomogram revealed a single well defined periapical unilocular radiolucency about 3x2 cm in size extending from 83 to 85 anteroposteriorly upto the lower border of mandible in relation with grossly carious 84 and 85. Tooth bud of 85 was present near the thin margin of lower border of mandible due to its displacement. Histopathological examination of the lesion revealed a similar inflammatory cell infiltrate as in case one along with odontogenic epithelium, thereby confirming the diagnosis of radicular cyst. A small radiolucency was noticed involving the buccal cortex of 75 suggesting a tendency of developing radicular cyst in the adjacent quadrant also. As an initial procedure, extraction of 84 and 85 was carried out in order to create a window through the extraction socket and 84 and 85. Also, extraction of 75 was also done in order to prevent developing a bilateral radicular cyst on the other side. The lesion was decided to be treated with surgical approach and a space maintainer with acrylic plug as in case one. (Illustration 1b).

Illustration 1b: Pre-operative radiograph

Illustration 2b (3 month post-operative): Orthopantomogram revealed slight occlusal movement of the tooth bud and initiation of bone formation in the cavity. The radio opaque flecks seen in the radiolucent cystic cavity was due to the presence of gauze packed with iodoform.

Illustration 3b (6 month post-operative): Orthopantomogram revealed marked occlusal movement of 45 along with its spontaneous mesiodistal correction with respect to the roots of 46. Complete reduction in radiolucency was also visible.

Regular treatment was carried out as in case one. The decrease in space present in socket area of 84 and 85 as seen in OPG after 6 months may be due to irregular wearing of the removable space maintainer. Unfortunately, the patient was lost to follow up. Surprisingly, a very rapid bone formation was observed in the cystic cavity within 6 months of treatment, inspite of the radiolucency involving the mesial root of 46. So, we can expect good healing of the cyst in this patient similar to that seen in case one.

Discussion:
Radicular cysts are inflammatory jaw cysts at the apices of teeth with infected and necrotic pulps. A radicular cyst arises from the epithelial residues in the periodontal ligament as a result of inflammation, usually following death of the pulp. Dentigerous cyst, odontogenic keratocyst, central giant-cell granuloma, and unilocular ameloblastoma can mimic a large radicular cyst. A radiograph does not differentiate between the various types of lesions as mentioned above which are
associated with the root of a nonvital or a vital primary tooth involving the crown of a developing permanent tooth. Therefore, FNAC and histopathologic examination of the cyst contents and lining is a must for final diagnosis. Usually radicular cyst are enucleated, where the cystic lining is separated from its inner bony surface and removed and the cavity is allowed to fill with blood clot. Alternatively, the cyst may be marsupialized to relieve the internal pressure. The main advantage of marsupialization is that it is a simple procedure to perform. It may also spare vital structures from damage better than when immediate enucleation is attempted. Marsupialization is favored because of lower morbidity and the fact that bony ingrowth occurs as the lesion shrinks in size, resulting in more normal bony contour. Some authors advise that small cysts (<3cm) are usually enucleated, whereas large cysts (>3cm) are often marsupialized. In both our cases, there was a large cystic lesion present, which extended to the lower border of mandible and leaving behind a very thin margin of lower border of mandible. Marsupialization allowed healing of the lesion without causing fracture of the inferior border of the mandible along with preservation of permanent tooth buds. It also led to complete ossification of the bony defects in few months and a near normal eruption of succedaneous teeth. It is very likely that reduction of intracystic pressure is a key factor in healing process. The successful preservation and eruption of the affected teeth in these cases may be attributed to the active growth potential and remodeling of bone in children unlike in adults where jaw growth is completed. Marsupialization may also be considered for cases with large maxillary radiolucent areas involving the antrum and tooth buds.

Conclusion:
The old adage "A stitch in time saves nine" holds true especially in pediatric dentistry where early diagnosis and proper treatment can save affected teeth. Considering the radiographic evidence of healing, marsupialization should be accepted as a standard treatment procedure for large cysts of the jaws, especially in pediatric cases where there is frequent proximity of these lesions to the developing permanent tooth buds and other vital structures.

References: