CASE REPORT

REHABILITATION OF A CYSTIC MIXED DENTITION MANDIBLE FOLLOWING MARSUPIALIZATION WITH A MULTIPURPOSE ACRYLIC SPLINT ACTING AS A SPACE MAINTAINER AND AN OBTURATOR

Nawaz MS, Yazdanie N, Faheemuddin M
FMH College of Medicine and Dentistry Lahore

Radicular cysts are the most common odontogenic cystic lesions of inflammatory origin which can be managed by marsupialisation specially if the cyst is large and is in relation to the vital structures. This article presents a case in which a radicular cyst was present in association with grossly carious deciduous molars and has been treated by marsupialisation. Postoperatively a surgical splint was inserted to maintain the patency of the bone cavity. This obturator splint also acts as a space maintainer to prevent space loss and ensure unimpeded eruption of permanent premolars.
Keywords: Marsupialisation, Space Maintainer, Obturator, Mandibular Splint, Mix Dentition Stage, Radicular cyst

INTRODUCTION

Mix dentition stage in children ranges from 5½–12 years. This stage is critical because the quadrant wise sequential shedding of primary teeth is one of the important factors that lead to the proper eruption of permanent dentition.[1–3] In case of early loss of deciduous teeth the entire mesiodistal width of lost deciduous teeth must be maintained to prevent the arch length deficiency thus space maintainers are used to temporarily occupy this space in order to prevent the space loss.[4] In contrast to this, the retained deciduous teeth may deviate the erupting permanent teeth in the arch. Similar effect can also be caused by cysts, tumours leading to malocclusion and permanent damage until intercepted by the clinician.[5]

Large Cysts can pose a problem in mixed dentition stage because the cystic pressure may lead to the deviation of the developing tooth buds and in some cases impaction of permanent teeth may also occur.[6,7]

One of the treatment modality for elimination of this cystic pressure is Marsupialisation (Partsch's operation). The principle of this procedure is to make an opening, i.e., fenestration on the outer wall of the cyst through which the cystic content drains into the oral cavity leading to bony ingrowth in the cavity. Gradually cyst is reduced in size to an extent that cystic lining becomes continuous with the oral epithelium and is changed by metaplasia into oral mucous membrane.[8–11]

CASE REPORT

An 8 years old male child visited Fatima Memorial Hospital with a chief complaint of persistent pain and swelling in left mandibular molar region. Intraoral examination revealed carious ipsilateral deciduous molars. Remaining dentition was intact and healthy.

On detailed history it was found that both these deciduous molars were grossly carious and painful for over 10 months. Panoramic radiograph revealed a large radiolucency under deciduous molars (Figure-1). The premolar tooth buds were involved in the radiolucency and the path of eruption was deviated. Based on history, clinical and radiographic examination, a provisional diagnosis of radicular cyst was made.

Medical history was uneventful. Deciduous molars were extracted and marsupialisation was carried out under local anesthesia (Figure-2), the superficial lesional lining was enucleated and intra cystic pressure was reduced by removing the cystic fluid using a sterile syringe. The bony cavity thus produced was packed for two days with iodoform gauze. The edges of the cystic capsule were sutured with the oral mucous membrane. The gauze was left for 2 days, after which an alginate impression was made of the bony cavity and an acrylic obturator fabricated. Design features included occlusal rest on the right first permanent molar and Adam's clasp on left 1st permanent molar (Figure-3). Subsequent laboratory procedures were carried out for the fabrication of acrylic obturator. On insertion of acrylic obturator splint the stitches are removed.

Care was exercised that the splint covered the entire mesiodistal width of the lost deciduous 1st and 2nd molars and also functioned as a space maintainer. Postsurgical period was uneventful. The cystic cavity was lined by non-keratinized stratified squamous epithelium with mixed inflammatory infiltration. The histopathological features were consistent with the clinical diagnosis of residual cyst. The obturator was filed every week and in this way it became smaller and smaller. On eruption of 1st premolar (Figure-4) the splint was trimmed to give space to this tooth and remaining portion maintained space for 2nd premolar (Figure-5). It remained in the mouth until the eruption of premolar took place which was visualized by subsequent radiographic evaluation (Figure-6,7).

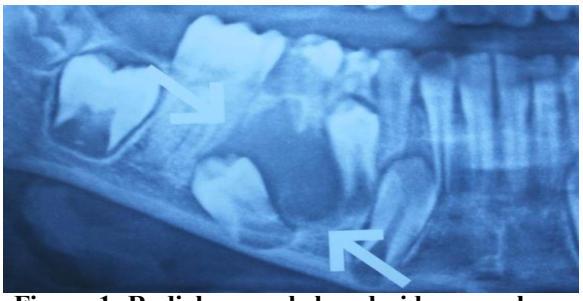

Figure-1: Radiolucency below deciduous molars, resisting the eruption path of pre molars

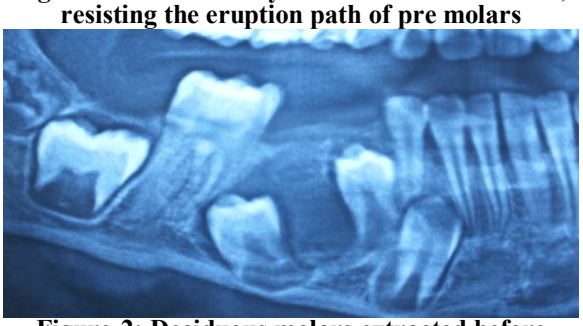

Figure-2: Deciduous molars extracted before marsupialization

Figure-3: Splint design involving Adam's clasp and occlusal rest

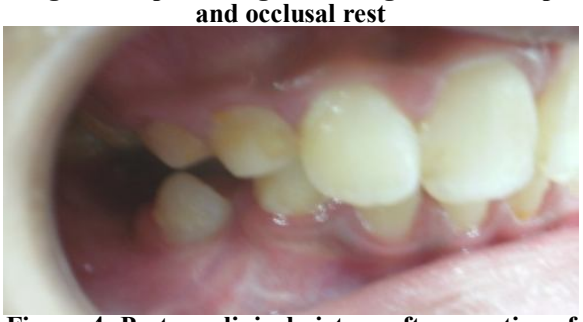

Figure-4: Post-op clinical picture after eruption of 1st premolar

Figure-5: Splint trimmed after eruption of 1st premolar

Figure-6: Splint in situ and improvement in eruption path of premolars

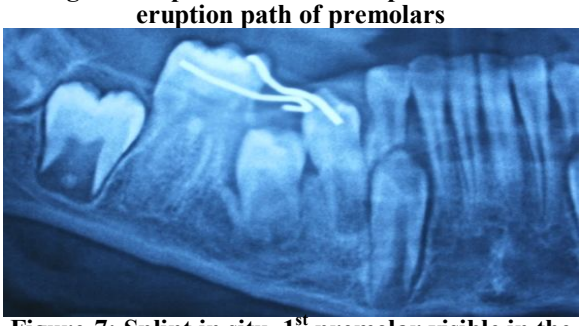

Figure-7: Splint in situ, 1st premolar visible in the oral cavity and 2nd premolar condition improved

DISCUSSION

In deciduous dentition there are more chances of caries development and caries progression leading to pulpitis and periapical infection as compared to the permanent dentition. The reasons attributed are decreased mineral content of deciduous tooth as compared to permanent teeth, eating habits and negligence due to age factor.[12] If the carious lesion stands for long it can cause periapical abscess which can lead to periradicular cyst, in children the bone mineralization is also relatively less than that of adults therefore the cyst can enlarge swiftly as compared to that of adults.[13–15]

For a stable and ideal occlusion during mixed dentition stage it is critical to maintain the proper eruption pattern and sequence of developing permanent dentition. In case of any hindrance in the path of eruption the developing tooth can either change its path of eruption or may not erupt in severe case. In this case periradicular cyst was hindering the eruption pathway of permanent premolars, therefore early diagnosis and treatment was necessary.[15]

For treatment of radicular cyst, each surgical technique has several advantages and disadvantages. The application of a particular surgical technique depends on the site, size, aetiology, characteristics and its features.[6] In mixed dentition stage if the cyst is small the treatment of choice is enucleation but if the cyst is in close association with important oral structures then marsupialisation is the recommended treatment modality.[7,16,17] Marsupialisation is favoured because of lower morbidity and the fact that bony ingrowth occurs as the lesion shrinks in size, resulting in more normal bony contour, Although it requires a long period of

postoperative management imposing a burden on the patient. The reduction of intracystic pressure is a key factor in the healing process.[17] In this case as the cyst was in close relation with developing premolars therefore, marsupialisation was preferred and performed.

Post operatively iodoform was packed to reduce the postoperative pain and infection. This gauze also kept the opening temporarily patent for initial two days until the obturator splint was inserted.[18]

The fenestration must be kept open to keep the cystic pressure to a reduced level that allows bone regeneration and recontouring leading to decrease in the cystic size. Common techniques are stitching the cavity lining with the epithelium or making an obturator splint.[8]

The customised obturator splint is preferred over the stitching technique in cases where longer duration of post-surgical healing phase is present.[9] Therefore in this case an obturator splint was fabricated to keep the opening patent and maintain the intra-cystic pressure to a reduced level, thus favouring the unerupted teeth to follow their normal eruption path.[9,10]

Rapid space loss occurs in first 3 weeks after extraction of deciduous molars therefore, the maintenance of space is necessary to prevent the decrease in arch length by mesial drifting of 1st permanent molar.[19] In this case the obturator splint maintained the entire mesiodistal width of missing primary molars thus preventing the mesial drifting of 1st permanent molar. The opposite primary molars were occluded on the acrylic platform along with the occlusal rest at one side and Adams clasp at the other side both of which prevented the gingival sinking of the obturator splint and thus maintaining the vertical space constant.[10]

The obturator required periodic filling/ trimming to decrease the size of the fenestration, ultimately leading to the closure of the lumen. This happens by decreased intracystic pressure, continued bone growth and metaplasia of cystic lining and changing of cyst lining to oral epithelial lining. Therefore, regular filling of the obturator splint[7,11,20] was carried out until the premolars appeared in the oral cavity.

CONCLUSION

Marsupialisation followed by acrylic obturator splint incorporating features of space maintainer is the preferred treatment especially in cases where there is a large radicular cyst involving primary molars. A fenestration is formed as a result of Marsupialisation, an obturator splint maintains that opening patent and space maintainer prevents arch length deficiency, all of which leads to decrease intracystic pressure, reduced cystic cavity size, bony ingrowth leading to exteriorisation of the cyst and thus removing the hindrance from the eruption path leading to proper eruption of teeth.

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Address for Correspondence:

Dr. Muhammad Sohaib Nawaz, House No. 4, Madina Block 4-C, Zaildar Park, Ichhra Lahore, Pakistan. **Tel:** +92-42-3757 9280, **Cell:** +92-333-4311247

Email: sohaibnawaz@live.com