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Management of premature bilaterally lost primary second molar: 3 year follow-up

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Abstract

E-space, the space that is occupied by primary second molar, plays a crucial role in the late transition phase from primary dentition to permanent dentition. Premature loss of primary second molars leads to a major discrepancy in space between arch length and tooth size. To avoid further orthodontic complications, it is advisable to place a space maintainer after successful premature extraction of the carious primary molar. Distal shoe is primarily given in cases where there is premature exfoliation or extraction of the second primary molar, before the eruption of the permanent molar. This case report describes the premature removal of a bilateral primary mandibular second molars, followed by delivery of a distal shoe appliance before the eruption of the first permanent molar.

Keywords: Bilateral distal shoe, Primary second molars, Permanent molar

Introduction

Primary dentition plays a very important role in guiding the eruption of permanent teeth and also in chewing, appearance, prevention of bad habits and speech[1]. The idea of a device to maintain space loss due to premature exfoliation in the dental arch was first given by Davenport, in 1887. Space maintainers are "the appliances used to maintain space or regain minor amounts of space

lost, to guide the un-erupted tooth into a proper position in the dental arch"[2].

E-space, the space that is occupied by primary second molar, plays a crucial role in the late transition phase from primary dentition to permanent dentition[3]. Premature loss of this tooth leads to a major discrepancy in space between arch length and tooth size[1]. Several appliances have been described for space maintenance of severely damaged or lost primary second molars, prior to the eruption of permanent first molars[4]. The distal shoe space maintainer, also called as Intra Alveolar Appliance/Eruption Guidance Appliance is a fixed type of space maintainer, which was first developed by Gerber in 1964[2]. It is primarily given in cases where there is premature exfoliation on the second primary molar, before the eruption of the permanent molar. Since this appliance helps in guiding the eruption of the first permanent molar, it is also called an Eruption Guidance Appliance[2.]

Case report

A female child aged 4.5 years reported to the Department of Pedodontics and Preventive Dentistry, in an institute in Pune with the chief complaint of pain and recurrent swelling in primary mandibular molars on right side. Clinical examination revealed grossly carious primary mandibular right and left second molar, deep occlusal caries with primary mandibular right and left first molar. **[Fig.1]**

Radiographic examination revealed furcal radiolucency and internal root resorption in relation to primary mandibular right and left second molar indicating pulp necrosis and bone resorption.**[Fig.2 (a)]** Radiolucency approximating enamel and dentin and involving pulp in primary mandibular right& left first molar. **[Fig.2 (b)]** The permanent mandibular right and left second premolar showed Stage 4 of development (Nolla's Stages of Tooth Development). **[Fig.2 (a)]** It was decided to extract primary mandibular right and left second molar. In this patient Willet's appliance or intra-alveolar, eruption guidance appliance type of space maintainer was given. The primary mandibular right and left first molars were pulpectomy treated and stainless-steel crown was given on them. **[Fig.3 (a) & (b)]** Stainless steel band were adapted on SSC's 74 and 84. Alginate impression was taken and bands were properly secured in the impression. Working model was prepared from the impression with dental stone keeping the bands positioned in the model. The distal extension was calculated radiographically, at the distal end of 75 and 85 a groove of 1.5 mm was cut in cast for the intra alveolar placement of loop to prevent mesial tilting of 36 and 46, component was adapted using 19 gauze wire & appliance was fabricated. After clinical and radiographic confirmation extension of appliance the appliance were luted to stainless-steel crown on primary first molars with Type I Glass Ionomer Cement. **[Fig. 4]** The procedure was carried under local anesthesia and follow ups were scheduled at every 3 month. In follow up visit's hygiene, infection, hard or soft tissue trauma, any distortion of appliance was checked.

After 2 year eruption of 36 and 46 was noticed. Also, the all-mandibular permanent incisors have erupted. Then the distal shoe space maintainers were removed and fixed lower lingual holding arch space maintainer was given and patient was kept under follow up at 6 months interval. **[Fig. 5 & 6]**

Figure1

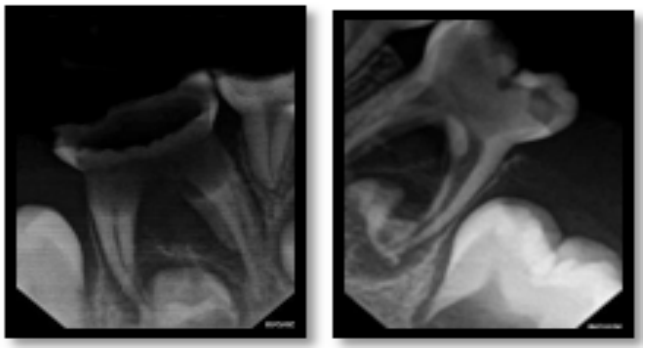

Figure 2 a

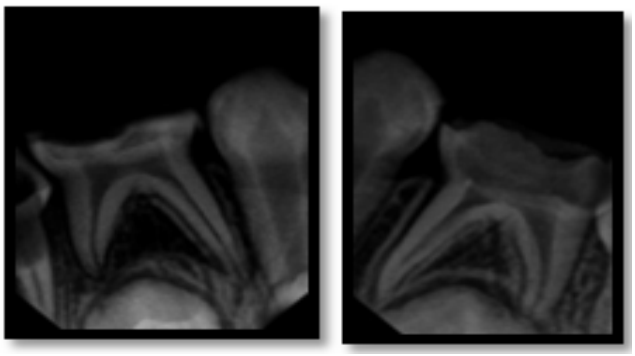

Figure 2 b

Figure 3a

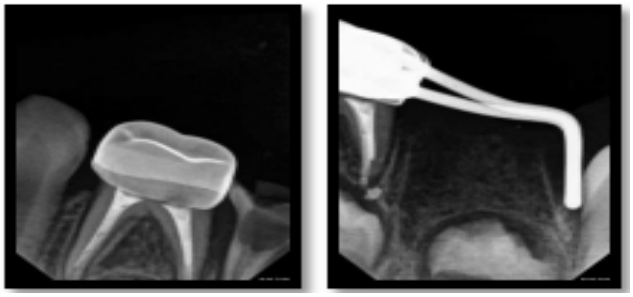

Figure 3b

Figure 4

Figure 5

Figure 6

Discussion

Dental caries is the most common reason for the premature loss of deciduous teeth. Others are being trauma, ectopic eruption, congenital disorders, premature resorption due to arch length deficiency. Depending on the tooth lost, segment involved, different types of space maintainers must be indicated which help in restoring normal function and eruption of permanent teeth[4]. Distal shoe space maintainers are indicated to guide the unerupted or erupting permanent first molar into normal eruptive position followed by premature loss of primary second molar[5].

The success criteria of a distal shoe space maintainer, as defined by Baroni et al and Qudeimat et al, is the successful guidance of the unerupted permanent tooth in the arch with no problems associated with the appliance[4].The other factors to be considered, include a long-range plan for space management in a growing child whose occlusion will need surveillance through three developmental stages: the primary, the mixed and the permanent dentition[4]. In Present case, the unerupted permanent molar was successfully guided into the arch with no problem associated with it and also in mixed dentition the lower lingual holding arch has been given and follow ups are scheduled. One major limitation or drawback of distal shoe space maintainer is noncompliance of the patient. In this particular case the appliance was well accepted by the patient.

Conclusion

In Pediatric Dentistry the main concern of the dentist is to provide maximum benefit to the child with minimum discomfort, more co-operation. One of the important concerns for a pediatric dentist is to try and save the primary second molar before the eruption of the permanent first molar. In present case both primary lower molars were compromised and advised for extraction. Thus, bilateral distal shoe appliances were given which were well accepted by the child & the appliance guided the eruption of permanent molar in correct place.

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