WILLET'S DISTAL SHOE: AN EFFECTIVE SPACE MAINTAINER FOR PREMATURE LOSS OF PRIMARY MANDIBULAR SECOND MOLAR - A CASE REPORT

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Abstract

Background: Preservation of deciduous teeth till its normal exfoliation plays a crucial role in preventive and interceptive dentistry. Premature loss of a deciduous tooth or a group of teeth might lead to wide range of implications. When the deciduous second molar is lost before the eruption of first permanent molar, intra-alveolar type of a space maintainer is indicated. This paper describes distal shoe in cases of loss of primary deciduous second molar before the eruption of the permanent mandibular first molar in a five year old child.

Kerwords: Occlusion guidance, Pediatric dentistry, Space maintenance, Willet`s distal shoe.

Introduction

The distal shoe space maintainer, as introduced by Gerber[1] and extended by Croll[2,3] is a valuable part of the pediatric dentist's armamentarium, because in those cases where the second primary molar is lost prematurely, it helps in guiding the eruption of first permanent molar. In the absence of the second primary molar mesial movement and migration of the permanent molar may be expected to occur before and during its eruption. An unerupted first permanent molar may drift mesially within the alveolar bone resulting in a loss of arch length and possible impaction of the second premolar. The distal shoe has an extension going subgingivally to a location mesial to the unerrupted first permanent molar. In 1973, Hicks outlined in detail the indications and contraindications for the distal shoe appliance, as well as the diagnostic and systemic considerations.[4] The objective of this paper is to present a case of distal shoe space maintainer in a five year old child.

Case report

A five year old female child referred to the department of pediatric dentistry with the chief complaint of pain in lower left and right back region since 2 months. There was no significant medical history present. On intra oral examination Chronic irreversible pulpitis irt 55, 75, 85 and dental caries irt 54, 64, 65,73,74 were evident. [Figure 1]

Figure 1: Preoperative intraoral view of maxillary and mandibular arches

Radiographic examination- Intra oral periapical radiograph of 55 revealed a marked radiolucency extending to enamel, dentin and also involving pulp [Figure 2a] and radiograph of 65 revealed a radiolucency extending enamel, dentin and pulpal involvement. [Figure 2b]

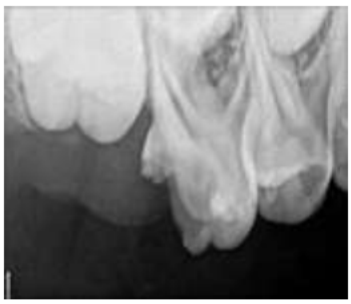

Figure2a- Pre-operative radiograph of 55

Figure2b- Pre-operative radiograph of 65

Intra oral periapical radiograph of 75 revealed a marked radiolucency extending to enamel, dentin and also involving pulp with involvement of the furcation area. [Figure 3] Whereas radiograph of 85 revealed a radiolucency involving enamel, dentin and pulp. [Figure 4]

Figure 3: Pre-operative radiograph of 75

Figure 4: Pre- operative radiograph of 85

Treatment planned in this case was the extraction of 75 followed by distal shoe space maintainer. Lesion sterilization and tissue repair therapy was done in 55 [Figure 5] and 65 [Figure 6] followed by stainless steel crown.

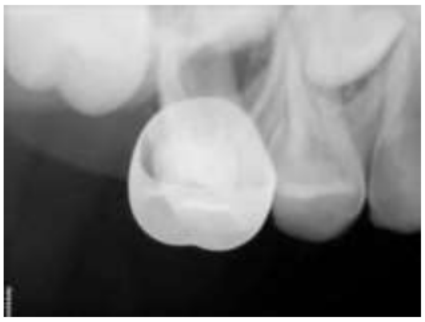

Figure 5: Stainless steel crown irt 55

Figure 6: Stainless steel crown irt 65

Pulpectomy in 85 was done followed by stainless steel crown. Glass ionomer cement restoration was done irt 54, 64, 73, 74. It was decided to extract primary mandibular left second molar and an eruption guidance was indicated. Suitable banding was fabricated on mandibular primary first molar. An alginate impression was made and band was transferred to the impression. Primary mandibular second molar was then extracted and extracted tooth was placed and stabilized into impression after disinfection and root planning. Impression was poured in dental stone and the extracted tooth was removed from the cast. The gingival extension was calculated radiographically, distal shoe appliance was fabricated in such a way that distal extension can be seated at mesial surface of permanent first molar just 1 mm below the mesial marginal ridge. The procedure was explained to the patient, the inter alveolar projection of the appliance was placed in the socket so as to touch and guide the vertical eruption of unerupted permanent first molar on the left side of mandibular arch. [Figure 7]

Intra oral periapical radiograph was taken to check the passive contact between the mesial end of permanent first molar and the appliance before the cementation. [Figure 8]

Figure 7: Cementation of distal shoe space maintainer

Figure 8: IOPAR taken after the cementation

The recalled visits were planned after every 3 months to check the condition of the appliance. After 1 year the mandibular permanent first molar was correctly guided into its place by the distal shoe space maintainer (figure 9 & 10).

Figure 9: Erupted permanent left first molar

Figure 10: IOPAR after 1 year follow-up

Discussion

Dental caries is the most common cause of the premature loss of primary teeth; other indications include trauma, ectopic eruption, congenital disorders, and premature resorption due to arch-length deficiency.[5] One of the most frustrating problems of managing the developing dentition is the premature loss of the primary second molar prior to the eruption of the permanent first molar. An erupting tooth adjacent to an edentulous area has a greater potential for space loss than fully erupted ones, indicating that clinical intervention should be considered. Sequelae requiring no intervention include ectopic eruption of the permanent molar and tipping into the space required for the eruption of the second premolar, resulting in its impaction. Additionally, molar relationships may subsequently be altered. Providing space to allow teeth to erupt and prevent impactions is valuable. A space maintainer that will guide the permanent first molar into its normal position is indicated. The appliance traditionally suggested as the treatment of choice is the distal shoe space maintainer.[4]

Thus distal shoe space maintainer is very useful in case of premature loss of primary second molar prior to eruption of permanent molar. If various other factors like co-operation, maintenance of oral hygiene can be achieved successfully, the conventional design of distal shoe is effective.

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