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Case Report

Modified Intra-alveolar appliance — Case report

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ABSTRACT

Arch space/ Tooth size discrepancy occurs whenever there is an early loss of the deciduous molars which eventually leads to malocclusion. Prevention of this discrepancy has always been a challenge for a pediatric dentist. This case report describes modified bilateral distal shoe appliance fabricated due to inadequate abutment support.

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1. Introduction

In 1887, Davenport first gave the idea of a device which will help in maintaining the space for the permanent/succedaneous teeth in the case of early loss of primary teeth in the dental arch.¹ Space maintainers can be a removable or fixed type. In the cases where untimely loss of primary second molars occurs before the eruption of permanent first molar distal shoe space maintainer is indicated and it is also known as Intra-alveolar Appliance/Eruption Guidance Appliance since it helps in the eruption of permanent first molar in its position. Gerber in 1964 fabricated this space maintainer and later it was modified in 1980.^{2,3}

2. Case Report

A 6-year-old girl reported to the Department of Pedodontics, with the chief complaint of pain in the lower right back tooth region since one week. Intraoral examination presented grossly decayed 75, 84 and 85 on the lower right and left side, caries was also present w.r.t 74. The permanent first molar of right side was yet to erupt and on left

side it had partially erupted. (Figure 1). IOPA radiograph revealed inter-radicular radiolucency and root resorption with respect to 75, 84 and 85 (Figures 2 and 3). Therefore, as prognosis for pulp therapy treatment was poor wrt tooth # 75, 84, 85 it was decided to extract those teeth and fabricate a modified bilateral distal shoe appliance as a space maintainer till the permanent teeth come in occlusion. Along with this procedure tooth # 74 was to be restored using cention restorative material.

Before starting the treatment, the procedure was described to the patient's parents and informed assent was obtained. The 74 was excavated for caries and restored with cention. Band adaptations were done on lower left first deciduous molar (74) and lower right deciduous canine (83).

On the working model, the primary second molar served as a guide for calculating the horizontal length of distal extension. Radiographically, the vertical depth of intra-alveolar projection was calculated, and a cut was made in the cast and using 19-gauge wire the wire components were adapted. From anteriorly the wire component was made like lingual holding arch and from posterior the wire component like the distal shoe and soldered to the bands. In the next appointment, the teeth # 75, 84, 85 were extracted under local anesthesia and after stoppage of blood flow the

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appliance was placed.



Fig. 1: Preoperative intraoral photograph.



Fig. 2: Pre-operative IOPA radiograph of 84,85



Fig. 3: Pre-operative IOPA radiograph of 74,75



Fig. 4: OPA represent position of distal shoe

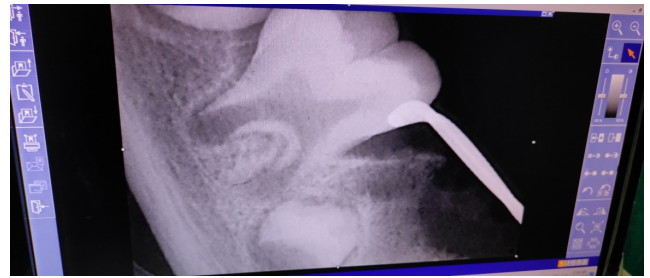


Fig. 5: OPA represent position of distal shoe extension wrt 46



Fig. 6: Intraoral photograph of the distal shoe appliance

With the help of a radiograph (Figures 4 and 5) the position of the appliance was confirmed and once the position was confirmed the appliance was cemented using GIC luting material (Figure 6). Recall appointments were scheduled after one week, one month and then after 3 months.

3. Discussion

Early exfoliation of primary second molar always has been a challenge and early exfoliation of multiple primary molars becomes even a greater problem for the pediatric dentist. If no appropriate preventive measure is taken it can lead to malocclusion. To avoid such occlusal discrepancies space maintainers are indicated after clinical and radiographic investigation.

Generally in case of early exfoliation of second primary molar before the eruption of first permanent molar the space maintainer indicated is distal shoe space maintainer. In certain clinical situation, like in the present case with multiple bilateral losses of primary molars the conventional space maintainer needs to be modified to meet the patient's need. Some modifications like the one given by Croll⁴ in which prefabricated lingual arch wire embedded in acrylic and the use of an acrylic pressure ridge by Gegenheimer but the major drawbacks of these modifications was poor retention and patient compliance.⁵ An identical space maintainer as used in this case has been given previously by Gujjar KR et al.

in their study which concluded that customized Distal Shoe Appliance was stable and showed acceptability by the patient.⁶ The advantage of this design is that it maintains bilateral mesio-distal dimension of the space without any compromise on the stability or cooperation of the patient. Quidemat et al.⁷ suggested that the criteria of a successful placement of distal shoe space maintainer is judged by the correct position of the un-erupted permanent first molar without any hinderance by the distal shoe appliance. In present case also, the first permanent molars completely erupted after 3 months in their normal position in occlusion.


4. Conclusion

In the cases where there is early exfoliation of multiple primary molar before the eruption of permanent first molar and stability becomes the challenge this modified bilateral distal shoe appliance can be an alternative treatment option. Although, more clinical trials are required regarding the use of this modification of distal shoe in paediatric dentistry.

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