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Case Study

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DISTALIZATION OF MANDIBULA FIRST PERMANENT MOLAR BY "NITI BONDED SPACE REGAINER": A CASE REPORT

Dr. Bornisha Bezborah[1]*, Dr. Naveen Manuja[2], Dr. Anushka Gayan[3] and Dr. Seema Chaudhary[4]

[1,3]Post Graduate Student, Department of Paediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh.

[2]Professor, Department of Paediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh.

[4]Professor and Head, Department of Paediatric and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh.

***Corresponding Author: Dr. Bornisha Bezborah**

Post Graduate Student, Department of Paediatric and preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, Uttar Pradesh.

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ABSTRACT

Background: The early loss of primary teeth following the emergence of the first permanent molar can lead to a forward movement of the first permanent molar. In such cases, a space regainer is needed. The NiTi bonded space regainer was designed to overcome some of the limitations of the conventional removable and fixed regainers. **Case description:** An 11-year-old patient with loss of space due to early exfoliation of 75 was given a "NiTi bonded space regainer". A piece of nickel-titanium (NiTi) wire bonded between the teeth in active loop form, and the unique shape memory property of NiTi wire will upright or move the teeth and the lost space can be regained easily. **Results**: After 4-week follow-up, space was regained with the uprighting of molars. **Conclusion:** NiTi bonded space regainer was effective in regaining the space in a short duration of time.

KEYWORDS: nickel-titanium wire, space regainer.

INTRODUCTION

The transition from primary teeth to permanent teeth is a complex process that involves the shedding of primary teeth, the eruption of permanent teeth, and the establishment of occlusion, all occurring in an independent yet harmonious sequence.[1] Numerous morphogenetic and environmental factors shape occlusal development, and any disorder or deviation in these factors can impact occlusion. Among these, primary teeth play a crucial role because their natural exfoliation often promotes favorable alveolar growth, which can create adequate space for the proper accommodation of the incoming permanent teeth.[2]

A pediatric dentist aims to guide the development of occlusion, preventing potential deviations and addressing developing malocclusions. The premature loss of primary molars can cause occlusal discrepancies and malocclusion in permanent teeth. Specifically, the early and untimely loss of the second primary molar in the lower arch can result in mesial shifting of the first permanent molar, leading to space loss and inadequate arch length.[3] Traditional space regainers, such as spring regainers, lip bumpers, active lingual bars, and extraoral appliances, have several drawbacks. These include requiring multiple dental visits, the need for band formation, complex laboratory procedures, potential adverse effects on gingival health from the bands, the risk of secondary caries under the bands, and the necessity for patient compliance.[4]

"NiTi bonded space regainer" a fixed space regainer was used in the mandibular arch to distalize the first permanent molars. It is a simple appliance, that can be used chairside in a single visit.

This case report explains the need of timely intervention to regain the space loss in the mandibular arch owing to premature loss of second primary molar.

CASE DESCRIPTION

A female child patient aged 11 years was reported to the Department of Paediatric and Preventive Dentistry with a complaint of a missing tooth in the left back tooth region since 1 year. Clinical examination revealed prematurely missing 75 and mesially inclined 36 (Fig. 1). The history revealed that the tooth was extracted owing to gross decay. The decision to fix "NiTi bonded space regainer" was made. A bracket was bonded on the buccal side of the permanent first premolar and a composite dimple was bonded on the buccal side of the permanent first molar with the help of an explorer burrow a tunnel into the

mesial of the dimple, creating a composite tunnel that is open only on the mesial end. A piece of 0.016-inch NiTi wire is then bonded on the buccal side of the first premolar and extended beyond the dimple. After the composite has set on both teeth with the help of a birdbeak plier, the free end of the wire is directed into the tunnel made in the dimple of the first molar. This will give a form of an activated loop of NiTi wire [Fig 2]. A small amount of bonding material is placed in the opening of the tunnel to make the attachment more permanent.

Over time the loop returned to its original shape due to unique shape memory property of NiTi wire, distalizing and uprighting the first molar.

Fig. 1: Clinically missing 75 and mesially shifted permanent molars.

Fig. 2: NiTi bonded space regainer.

FOLLOW-UP

The patient was recalled weekly for the follow-up, within 4 weeks the required space was regained. The wire segment is left in place as a passive space maintainer till the eruption of the second premolar (Fig 3). After the eruption of the second premolar and appliance was removed. (Fig. 4)

Fig. 3: Eruption of second premolar.

Fig. 4 : Post-removal of appliance.

DISCUSSION

The eruptive forces of the permanent first molars tend to shift mesially if the guiding planes of the distal surface of the primary mandibular second molar distal roots are prematurely missing.[5] Orthodontically, it is challenging to regain the space lost from the early loss of primary molars and to achieve stable molar intercuspation by flattening the excessive curve of Spee.[6] Maintaining space after the early extraction of primary teeth is crucial for guiding the development of a healthy occlusion. This can be achieved through either passive or active occlusal guidance. Passive occlusal guidance uses space maintainers, while active occlusal guidance involves space regaining. The latter is employed when dimensional changes in the dental arches are detected, necessitating treatment to recover the space lost from premature extractions.[7] Mandibular first permanent molar suffer mesial inclination more than maxillary first permanent molar.

In this case, the NiTi bonded space regainer successfully recovered the lost space in the shortest possible time. Advantages of this method are that the entire procedure can be completed in a single chairside visit, there is no need for procedures such as taking impressions, fitting bands, or soldering, better oral hygiene can be maintained since the appliance is self-cleansing and, patient compliance is improved.[4]

CONCLUSION

NiTi bonded space regainer was effective, easy, and showed good patient compliance.

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