

NITI-LIGHT CURE COMPOSITE SPACE REGAINER: A CASE REPORT

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ABSTRACT

Deciduous dentition serves as a matrix for the normal growth of the jaws, allowing the permanent teeth to fit properly. Early tooth loss compromises the integrity of the arch, reducing its length, perimeter, and circumference. Depending on how much space has been lost, the permanent tooth may emerge buccally/lingually, or it may remain impacted. Most commonly, the primary second molars are lost early due to dental caries which causes mesial drift of the permanent first molar. When the space is lost, therapy should be considered to avoid the development of additional disharmonies. There are a variety of gadgets available to help restore and maintain the space for the successor teeth. There are both fixed and removable space regainers available. New developments in the quest for simpler and more effective space regainers are constantly being made. A simple and easy to make device is always preferable. In this article, a simple space regaining method is described which is fabricated by a small piece of nickel titanium (NiTi) wire bonded between the teeth with the help of composite resin in active form, and the unique shape memory property of NiTi alloy wire will upright or move the teeth and the lost space can be regained easily.

KEY WORDS: NiTi wire, composite, space.

INTRODUCTION

If arch integrity is disrupted by early loss of primary teeth, problems may arise that affect the alignment of the permanent dentition. Opposing teeth can supraerupt, teeth that are distal to the space can drift and tip mesially, and teeth mesial to the space can drift and tip distally.^[1] This results in deficiency of space for eruption of permanent teeth, which results in blocked or deflected eruption of the same. This also gives rise to unattractive appearance, food impaction areas, increased caries and periodontal diseases and most importantly malocclusion. Corrective measures such as passive space maintenance, active tooth guidance with space regainer, or a combination of the two may be required to optimise the normal occlusal development process when primary teeth are lost early.

The un-erupted tooth is guided into the proper position in the arch with the help of a space maintainer. In addition

to ensuring proper function and preserving the arch length, it also prevents the development of bad oral habits, preserves the child's appearance, and eliminates any possible psychological harm. As a result, it allows for the proper alignment and occlusion of the permanent tooth to be achieved.^[2]

When it comes to the consequences of early deciduous tooth loss, a paediatric dentist is frequently the first point of contact. As a result, it is critical for paediatric dentists to take preventative measures early in order to minimise the long-term impact on the child's dentition, psychology, and personality.

At the beginning of the orthodontic treatment process, various types of orthodontic archwires are presently utilised by the orthodontist. Because of the nickel-titanium (NiTi) alloy's optimal elasticity, low stiffness, high flexibility, and high spring back, nickel-titanium

archwires are most frequently used for the initial levelling and alignment of the teeth.^[3-5] This article reveals a simple method of regaining lost arch space by fabrication of a bonded space maintainer with Nickel-Titanium (NiTi) wire and light-cure composite. This does not require multiple visits, banding of teeth, complicated lab procedures.

CASE REPORT

The parents of a 10-year-old male child reported to the Dept. of Paediatrics and Preventive dentistry with a complaint of non-eruption of teeth. There was a history of early extraction of #75 (mandibular left primary second molar). Intra-oral examination shows distal tipping of #34 (mandibular left permanent first premolar). Intraoral periapical radiograph revealed the same. The bud of #35 appeared to be distally rotated. Model analysis (Tanaka-Johnson analysis) revealed that there was space loss of about 3.0 mm at #34, #35, #36 region due to distal tipping of #34, and there was less space for proper eruption of #35. So, treatment plan was done for a space regainer.

After etching of the buccal surface of #34 and #36 with 37% orthophosphoric acid gel, the teeth were dried with air from three-way syringe after washing away the residual gel. Then, bonding was done with a 5th generation bonding agent. After that two rectangular buttons of composite were built up on the buccal surface of #34 and #36. After that, a horizontal slot is prepared on the composite buttons with a narrow fissure bur parallel to the occlusal plane of #34 and #36. The slot is prepared in such a way so that the mesial wall of the composite button on 34 and distal wall of the composite button on #36 remains intact.

Now, a piece of 0.016" Nickel -Titanium (NiTi) wire is taken according to the measurement including the space to be regained (3mm) and an extra 2mm of length. The distal end of the wire is kept in the slot prepared on the composite button of 36 and the mesial end is tucked into the slot of #34 with the help of curved mosquito artery forceps. This action gave the wire a bow-like bend buccally. Care is taken to keep the plane of curvature of the bow parallel to the occlusal plane to minimise the chances of intrusive or extrusive movement. The slots on

the composite buttons are then filled with composite resin after bonding protocol is done. Thus, the piece of NiTi wire is attached between the acrylic buttons in active bow form.

In due course of time, the NiTi wire became straight owing to its shape memory property, uprighting the distally tilted premolar. The lost space was regained in a period of 8 weeks. After the correction, the piece of the wire is kept as passive space maintainer until the eruption of second premolar.

DISCUSSION

There are multiple ways available for regaining lost space in a dental arch as interceptive orthodontic procedure to minimize the chance or severity of future malocclusion. The NiTi wire has excellent spring back compared with other wires, and can apply light load in a wide range due to its molecular and crystalline composition.^[6] This spring back (shape memory) function has been utilised here to regain the lost arch space. This particular method has certain advantages over the others. The entire procedure can be accomplished in single visit chairside only. No banding or any other complicated lab procedure is needed, thus multiple visits to the dental clinic is avoided. There is improved patient compliance as we can avoid the messy step of impression taking. Maintenance of oral hygiene is easy with NiTi space regainer as compared to others.^[7]

NiTi space regainer used in this case is less bulky too which added to the comfort of the patient. But fabrication of this space regainer requires proper moisture control and precision. This may not be the best option in uncooperative patients.

CONCLUSION

NiTi space regainer can be used as a feasible option to regain lost arch space to facilitate proper eruption of the teeth and to minimize the chance of developing malocclusion.



Figure 1, 2, 3: Pre-operative photographs and radiograph showing distally tilted 34 resulting in lesser space for eruption of 35.



Figure 4, 5, 6, 7: Per-operative photographs showing the different steps for fabrication of the NiTi space regainer.



Figure 8, 9, 10: Post-treatment photographs and radiograph showing regained lost space and upright 34 which was tilted previously.

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