CASE REPORT

Simplify your space maintenance with the new H-appliance: A case report

Pheiroijam Herojit Singh

Department of Pediatric and Preventive Dentistry, Jaipur Dental College, Jaipur, Rajasthan, India

Abstract

Early loss of deciduous molars results in deficiency of space for erupting permanent successors, leading to crowding and malocclusion. Hence, the need arises for maintaining the space previously occupied by the primary teeth to preserve the integrity of the dental arch length. Space maintainers are used to maintain such space. Band and loop space maintainer is the most commonly used space maintainer for early loss of a single primary molar, but it offers a lot of disadvantages to both the dentists and the patients. Hence, the “H-Appliance” is designed to solve the disadvantages of a conventional band and loop space maintainer. In this case report, a patient of an 8-year-old child who had a severely broken down upper right primary first molar was extracted, and the H-Appliance was delivered to maintain the space. The H-Appliance is a “bracket and hook” space maintainer. It is not only simple, easy, and comfortable to wear but also requires few instruments, can be fabricated within minutes, and does not require welding or soldering.

Keywords: Bracket and hook, deciduous teeth, primary molar, welding

Introduction

Deficiency of space in permanent dentition is a result of early loss of one or more deciduous teeth with corresponding loss of space. Space maintainers are appliances used for maintaining space for the erupting permanent teeth. Hence, it is necessary to maintain the space created from the early loss of primary teeth using space maintainer appliance.

The conventional band and loop space maintainer is used for early loss of single, unilateral or bilateral, and maxillary or mandibular primary molars. The appliance has been recommended by most of the dentist, but it has a number of disadvantages, namely, (1) it requires at least two appointments for delivery of the appliance; (2) band displacement during cast pouring resulted in ill-fitting of the appliance in the patient’s mouth; (3) breakage and dislocation of band due to cement dissolution; (4) welding and soldering works are required for fabrication of the appliance which is time consuming; and (5) band making is difficult on partially erupted distal molars.

In view of the above disadvantages, a new design of space maintainer called H-appliance which is a simple “bracket and hook” space maintainer is being discussed in this article. The H-appliance is simple and easy to fabricate and eliminates the use of many instruments and lengthy procedures such as band making, welding, and soldering.

Appliance Design and Fabrication

Instruments and materials required: Universal plier or beak plier, hard wire cutter, adequate length of 23 gauge hard stainless steel wire, and Begg’s orthodontic bracket.

Method

1. Impression is taken and casts are prepared
2. A 23 gauge hard stainless steel wire is adapted by making two clasps such as hooks on both abutment teeth [Figure 1]
3. A Begg’s orthodontic bracket is inserted into the distal hook. Directly bondable molar tube can be used instead, but it will be too bulky and uncomfortable to child patients. The distal end of the wire is bent by making a small pinhead loop near the distal interproximal space, and the wire is closely adapted on the palatal surface of the crown [Figure 2]
4. If the mesial abutment is primary anterior tooth, an indentation of about 0.5 mm is made on the distal proximal surface of the mesial abutment tooth for retention of the mesial hook
5. If the mesial abutment is primary molar, no indentation is required because retention is provided by cervical constriction of the crown of primary molar. The mesial hook is adapted first followed by adaptation of the distal hook and bonding of the bracket using orthodontic light cure composite resins. The bracket should
always be positioned at the palatal or lingual aspect more mesially. The bonded bracket will prevent displacement of the appliance.

**Case Report**

An 8-year-old female child patient visited the Department of Pediatric and Preventive Dentistry of Jaipur Dental College with a chief complaint of pain in the right upper back teeth. On clinical examination, it was revealed that the right primary maxillary first molar (tooth number 54) was severely broken down due to dental caries and only roots stumps were present [Figure 3]. The remaining root stumps were extracted and to preserve the space, “H-appliance” was fabricated and delivered [Figure 4]. Post-delivery instructions were given. The patient was recalled regularly after every 2 weeks. The patient's compliance was good. The patient has no complaint of irritation or dislodgement of the appliance during eating, talking, brushing, etc. After 10 months, radiovisiography shows erupting right upper permanent first premolar (tooth number 14) with adequate space [Figure 5].

**Discussion**

Maintenance of arch length during both dentition periods is of great importance for the normal development of future occlusion. Early loss of primary teeth can result from dental caries, trauma, infection, or crowding which may create orthodontic problems at later developmental stage. The loss of primary tooth before normal physiological exfoliation might also
result in discrepancy of the vertical and horizontal relationships in primary and permanent dentition. Hence, the need arises for the preservation of space provided by early loss of primary teeth until their permanent successors are erupted. The use of space maintainers can solve the problems and maintain the created space without any discrepancy.

The present design of space maintainer offers several advantages over the conventional band and loop space maintainer. The whole procedure from fabrication to delivery can be completed in single sitting and requires only few instruments. The extensive laboratory works such as welding, soldering, polishing, and finishing are not required. The present appliance has better retention due to cervical constriction of the crown of primary teeth and the patient's compliance is also better. Many dentists have found several disadvantages of the conventional band and loop space maintainer such as incomplete solder joint, overheating of wire during soldering, breakage of wire at joint during polishing, ill-fitting in patient's mouth, and failure of cementation. Another advantage of H-appliance is cost effective, easy to fabricate, and comfortable to wear.

**Conclusion**

The H-appliance is simple and easy to fabricate and requires less instruments without any lengthy laboratory works such as soldering and welding. It is recommended to all dentists to fabricate this appliance and try its result in their patients.

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**References**