

Modified Lingual Holding Arch Space Maintainer: A Case Report

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ABSTRACT

Background: It is important to be vigilant enough for the child in their initial period of growth regarding their orofacial structure. Space maintenance is one such option which helps in maintaining the arch integrity especially in all the four quadrants in the posterior segment of teeth. Space maintainer is an appliance indicated in a situation of premature loss of posterior primary teeth long before its exfoliation. The lingual arch space maintainer is one of its kind in space maintenance which helps in preserving the space created by multiple loss of primary posterior teeth after the eruption of permanent anteriors in the mandibular arch. The present article is a case report in a 7 yr old child with certain suitable modification of lingual holding arch space maintainer.

Keywords: Space Maintainer, Premature Exfoliation, Lingual Holding Arch.

INTRODUCTION

A lingual arch is a custom made, passive, fixed space maintaining device composed of molar bands conventionally cemented onto mandibular first permanent molar teeth. Stainless steel wire is soldered to the lingual surface of these bands, and extends anteriorly following the arch shape onto the lingual surfaces of the lower incisors.¹ In the mixed dentition, one mechanism for gaining or preserving space called Leeway space, is the use of the lingual holding arch. This space can be as adequate as 4.3mm, which helps in preventing crowding in mixed dentition.² Theoretically, arch perimeter is preserved and the leeway space is available to decrease the severity of the crowding problem present. The lingual arch is a commonly used space maintenance appliance, thought to maintain arch perimeter by preventing mesial tipping or drift of mandibular molars. The molar positions are stabilized against the mandibular incisors by the

appliance, which also prevents the incisors from tipping lingually.³ The present article is a case report in a 7 year old child with bilateral loss primary posteriors.

CASE REPORT

A 7 ¹/₂ year old patient reported to the department of paediatric & preventive dentistry in Darshan Dental College & Hospital, Loyara, Udaipur with chief complaint of pain in right & left lower back teeth region. There was no dental and medical history reported and the patient reported in good physical and mental health. Oral examination revealed grossly carious 74 & 85. The 75 & 84 were recently extracted being grossly decayed. On radiographic evaluation 74 & 85 found to be pulpally involved. A thorough treatment was planned for the same. 75 & 84 were treated by pulpectomy procedure & finally restored (Fig. 1). An impression was taken & model analysis of the

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Fig 1: Pre-operative mandibular arch (before space-maintainer).



Fig 2: Modified Lingual holding arch appliance after fabrication.



Fig 3: Appliance after placement.

poured cast was performed. On model analysis there was insignificant space loss. In the given situation crown cutting was performed on 85 & 74 & stainless steel crowns for both were tried in with

proper gingival margins without any blanching. The wire was now contoured on lingual side of the cast with 85 as right side abutment & on left side it was bent touching on mesial surface of 36 with buccal extension as C-clasp. The prepared stainless steel crowns now soldered to contoured wire at specific calculated points without disturbing the fitting of the assembly (Fig. 2).. This modified lingual holding appliance assembly was delivered (Fig. 3) & the patient is under follow-up.

DISCUSSION

During the transition from the mixed to the permanent dentitions, developmental changes occur in the arch, including even the leeway space. Normally, the first molars move mesially into the leeway space, and arch length decreases.⁴

Retention is a process of stabilizing the arch in shape with an intention of prevention of prospective crowding during the phase of eruption. Space maintainers are such devices to be used in fulfilling the goal of maintaining the arch dimension. It is highly imperative to use space maintainers in case of young children with high incidence of caries and consequent loss of primary teeth.¹ In the present case the space loss was found to be insignificant so the modification in its basic design was not necessary. The modification in this case was intended to reduce chair side time of band placement along with attaching wire to stainless steel crowns for the pulpectomy treated teeth. The Lingual holding arch in the present situation is passive in nature. This modified lingual arch is made up of 1mm stainless steel wire.⁵

This has been reported on in numerous clinical trials.^{6, 7} In the Brennan and Gianelly study, 87% of 107 patients displayed less than two mm of crowding after passive lingual arch appliances had been placed in the mixed dentition. Few authors have reported disadvantages of the use of a Nance lingual arch as a space maintainer, including possibility of extrusion of antagonist teeth, when considering the space left by the extracted tooth; non-reestablishment of the masticatory function; and previous history of sensibility to metallic materials⁴. Despite these negative factors, the literature has recommended its use by demonstrating countless advantages that overcome all disadvantage.⁸

Preventing space loss may benefit the patients in their function, occlusion and periodontal health. A wide variety of appliances used over the years for space management in paediatric dentistry with different designs and modifications either removable or fixed. However in this case a modification of a lingual holding arch incorporating crown and wire extension is an inspired design keeping its passive nature.

This modified lingual arch is made up of 1mm stainless steel wire. The 3M crown was used for the final restoration for 85 and 74. Mandibular impression is made to fabricate modified lingual holding arch then soldered with crowns. Then wire is attached on bilaterally on stainless steel crown as they already needed to be done as permanent restoration for pulpally treated teeth's with a distal extension on 36.⁹ Then modified lingual arch is cemented in place after fabrication. The extension on 36 is fabricated in such a way that it cannot interfere with the occlusion as well as prevent the mesial migration of permanent molar, thus acting as a space maintainer for uninterrupted tooth as well. The extension is passively contact the mesial surface of 36 with buccal extension as C-clasp for proper holding.¹⁰

The purpose of this article is to describe a situational technique for bilateral loss of posterior molars saving the undue time for band placement. This innovative design was well accepted by the patient and is under follow-up.

CONCLUSION

There can many clinical situations which require small modifications in design. Space maintainers should be custom made according to the clinical situation keeping the functions intact. It should also include patient factors of reducing chair side time & improving compliance.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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