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Research Paper

Simple Hygienic Fixed Functional Lingual Arch Space Maintainer: A Case Report

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ABSTRACT
Dental space maintenance is essential in cases of premature loss of primary dentition to prevent malposition, supra-eruption, impaction and crowding of the developing permanent teeth.This study highlights interim band and loop and a simple hygienic functional lingual arch space maintainer with movable self-cure acrylic base along with artificial teethover the conventional lingual arch
Keywords*: Functional, Lingual arch, Hygienic, Interim band and loop.*

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I. INTRODUCTION

Premature loss of primary tooth results in loss of space or arch length because of drifting of adjacent teeth into the space.[1] Arch length deficiency may result in crowding, impaction, irregularity of the permanent dentition, loss of structural balance and functional efficiency.[2]A 'space maintainer' is a fixed or removable appliance designed to preserve the space created by the premature loss of a tooth and prevent loss of arch length.[3]

This case report highlights interim band and loop followed by a simple hygienic functional lingual arch space maintainer over the conventional lingual arch.

II. CASE REPORT

A 6-1/2 year-old girl reported to the Department of Pediatricand preventive dentistry with the complaint of decayed teeth in lower left and right teeth back region. Oral examinationrevealed(Fig.1 and2)Grossly decayed 85, proximal caries and mobility with 84, proximal caries with 74 and deep occlusal caries with 75. Radiographic examination was performed and treatment plan was decided as follows,Pulpectomywith 74, 75 followed by SSCs , extraction with grossly decayed 85 and mobile 84 followed by interim band and loop space maintainer as lateral incisor was erupting and mesio-ligual slicing with 83.((Fig.3 and 4)

For the fabrication of band and long loop space maintainer proper size preformed band was selected and adapted on 46, alginate impression was made, into which band was placed. Casts was poured with dental stone. Band and long loop was fabricated using 0.9 mm stainless steel wire on the lower cast. Loop was soldered to the band. After polishing, appliance was evaluated intra-orally for any mucosal interferences or occlusal disharmonies and cemented onto 46 using luting glass-ionomercement.As the incisors were erupting phase patient was recalled for follow up by every three months. After 7-8 months with complete eruption and proper alignment of incisors it was decided to replace interim band and loop space maintainer with a simple hygienic functional lingual arch.

Band and loop space maintainer was removed. Oral prophylaxis was done. Selected preformed band was adapted on 36 and 46, alginate impressions were made of both the arches, into which bands were placed (Fig. 5). Casts were poured with dental stone (Fig.6). Wire component of conventional lingual arch space maintainer was fabricated using 0.9 mm stainless steel wire.Self-cure acrylic was mixed with monomer

andsleeve or roller was made. It was inserted into prepared wire component of conventional lingual arch (Fig.7). To prevent damage to the acrylic sleeve during soldering it was blocked with plaster (Fig8) and wire component soldered to bands on permanent 1st mandibular molars bilaterally. Plaster was removed and separating media was applied on to the edentulous area. Self-cure acrylic mixed with monomer adapted on to the edentulous area along with sleeve, artificial teeth were incorporated (Fig.9)and occlusion was evaluated(Fig.10). Finishing and polishing was carried out for the acrylic and metal components (Fig.11-12).The appliance was evaluated intra-orally for any mucosal interferences or occlusaldisharmonies. As patient was comfortable, appliance was cemented using luting glass-inomercement (Fig.13-14).The patient was recalled the next day for a check-up, following which after a week.

III. DISCUSSION

The common cause for malocclusion in permanent dentition is premature loss of a primary tooth. Teeth tend to drift into the space created by the loss of the deciduous toothresulting in tooth material arch length discrepancy.[4]Space maintainers are indicated to prevent drifting, tipping of teeth and to maintain the space for the eruption of succedaneous teeth. The band and loop space maintainer is indicated for the premature loss of single, unilateral or bilateral maxillary or mandibular deciduous molars.[5] In present case 84,85 were indicated for extraction and choice of space maintainer was unilateral band and loop as 42 waserupting. After cementing band and loop space maintainer patient was recalled for follow up by every three months. After 7-8 months oral examination revealed complete eruption and alignment of incisor.

In preventive and interceptive orthodontics a lower lingual arch is usually recommended as a holding device to maintain arch length by preventing mesial movement of the molars and lingual collapse of the lower incisors. It also utilize the leeway space to resolve mild lower arch crowding.[6] In present case a lower lingual arch was modified by incorporating artificial teeth with acrylic base attached to wire component of lingual arch to improve masticatory efficiency along with space maintenance.

The advantages of using this hygienic fixed functional lingual arch space maintainer are as follows:

(1) Restoration of masticatory function
(2) Prevention of supra-eruption of antagonists
(3) Hygienic movable framework design of acrylic sleeve along with acrylic base and artificial teeth helps patient to lift framework to maintain oral hygiene(Fig.15).

IV. CONCLUSION

As present simple hygienic fixed functional lingual arch space maintainer was fabricated using a simple technique and has various advantagesit could be considered over conventional lingual arch space maintainer.

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Fig. 1: Pre-op - Maxillary arch

Fig. 2: Pre-op Mandiular arch

Fig. 3: Post-op - Maxillary arch

Fig. 4: Post-op - Mandiular arch

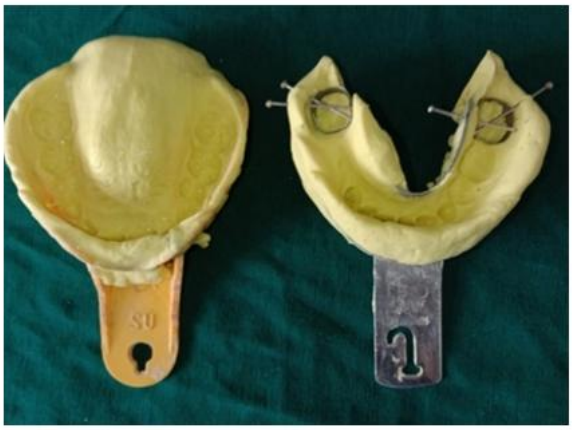

Fig. 5: Alginate impressions after placement of bands

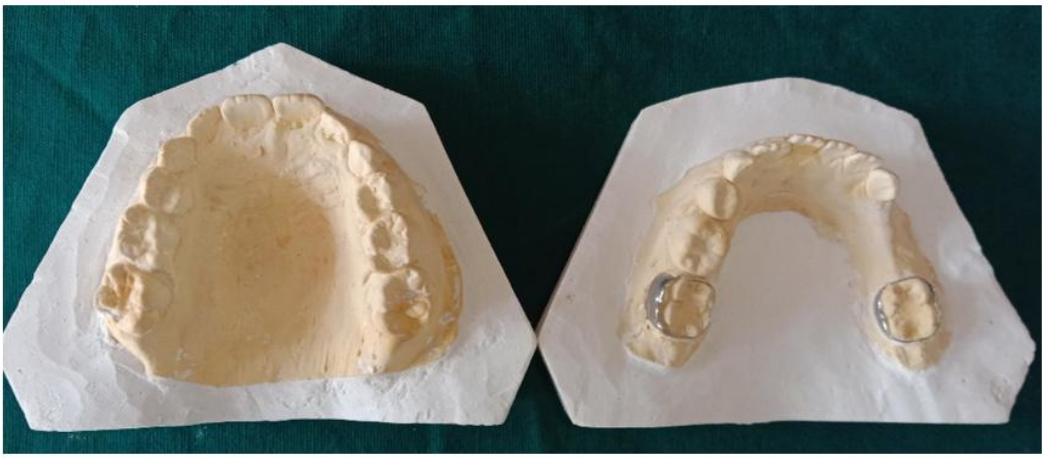

Fig. 6: Models

Fig7: Lingual arch wire component along with acrylic sleeve

Fig 8: Plaster blockout

Fig 9: Lingual arch incorporating acrylic base

Fig 10: Occlusal evaluation framework with artificial teeth

Fig 11: Lingual arch (superior view)Fig 12: Lingual arch (Inferior view)

Fig 13: Lingual arch (intraoral occlusal view)

Fig 14: Lingual arch (intraoral buccal view)

Fig 15: Hygienic Lingual arch with movable dentulous framework