A Custom Modified Band And Loop Space Maintainer- A Case Report

Pushpalatha C.1, Mala Devi M.2, Punitha S. Kamath3 and Shwetha G.4

*Corresponding Author Email: pushpalatha.pe.ds@msruas.ac.in

Contributors:
1Associate Professor, Department of Pedodontics and Preventive Dentistry, Faculty of Dental Sciences, RUAS, Bangalore.
2Post graduate student, Department of Pedodontics and Preventive Dentistry, Faculty of Dental Sciences, RUAS, Bangalore.
3,4Assistant Professor, Faculty of Dental Sciences, RUAS, Bangalore., Faculty of Dental Sciences, RUAS, Bangalore.

Abstract:
The occlusion in primary dentition is of prime importance as it plays an indispensable role in the development and stability of the permanent dentition. The early loss of primary teeth can result in decreased arch length, permanent teeth malocclusion, difficulty in speech and mastication. Space maintainers helps in preserving the space created by premature loss of primary teeth. Spacemaintainers fabricated necessitate certain clinical requirement. Conventional space maintainer is not appropriate in all clinical scenarios as the later varies. Through this article we are presenting a case report of an 8 year old boy with a modification of band and loop space maintainer customized to the existing clinical scenario.

Key words: Partially erupted molar; space maintainer; band and loop; modification

INTRODUCTION:
The goal of space maintenance is to preserve arch length, width and perimeter by maintaining the relative position of the existing dentition [1]. Planning for a space maintainer not only include the space analysis of the localised space but also the total arc length. A conventional band and loop maintains the mesio distal width in the given arch. The abutment tooth for banding should be intact and free of rotation. However if the clinical scenario fails to meet the above requirements, the conventional band and loop is not applicable. This is a case report with unilateral band and bent wire design.

Patients and methods
Case Report
An 8-year-old boy reported to the Department of Pedodontics and Preventive Dentistry, FDS, MSRUAS, Bengaluru, with a chief complaint of broken tooth in the right lower back teeth region since 3 months.

On clinical examination, Fair oral hygiene (OHI-S Score-2.6), Grossly decayed tooth 84, Partially erupted 36 & 46 and Crown and loop space maintainer in relation to missing 74 was noticed(Fig 1a).

An intraoral periapical radiograph (Fig 1b) of the 83,84 & 85 revealed coronal radiolucency of 84 involving enamel,dentine and pulp extending to the furcal area root resorption involving more than 2/3rd of root length. Nolla’s stage 6 of erupting 44 was noticed . A study model of the mandibular arch was done and Tanaka Johnston mixed dentition space analysis was carried out which presented space deficit of 1.8mm. The inference of the analysis indicate space maintainece. Based on the clinical scenario a modified unilateral band and bent wire design was planned.
Design and fabrication of the custom modified band and loop

A preformed band (35+ size, Optifit™) was adapted and burnished on the tooth surface of 46 and a quadrant alginate impression extending 5 mm beyond the distal abutment tooth was made. The band was stabilized and the cast was poured.

The custom modified band and loop space maintainer was designed and fabricated consisting of two components, an arm and a modified dumbbell shaped loop using 0.9-mm gauge (0.036”) orthodontic stainless steel wire. The unilateral arm was commenced from the middle third of the crown of 46, the first bend was given downwards in right angle to the occlusal plane along the mesiobuccal line angle of 46 (Fig 2a). This portion extended 2 mm below the marginal gingiva of 46 and a second obtuse bend was given to take the arm forwards, 1 mm away from the gingiva till the distal aspect and 2 mm below the marginal gingiva of 83 from where a third bend was given upwards and adapted below the distal contact area of 83. This formed the proximal part of the novel band and loop. The proximal part was then bent downwards to adapt along the lingual alveolar contour of missing 84 by giving a dumbbell shape which was then continued upwards below the mesial contact area of 85 and adapted to the proximal contour and ended in its mesiobuccal line angle (Fig 2b). The arm was soldered to the band of 46. The appliance was finished and polished. Try in was done to check for any occlusal hindrances and soft tissue impingement. The appliance was then removed, dried and cemented with type I Glass Ionomer Cement (GC gold label™, Tokyo, Japan).

Discussion

Space management curtails the emerging malocclusion in the permanent dentition essentially by preservation of space constituted by premature loss of the primary molars and Leeway space by placing holding arches for the unimpeded eruption of the permanent teeth.

The loss of space that exists following the premature loss of primary first molar is contributed to by two events. The first being the eruption of the permanent molars around 6-7 years, which will exert a strong force on the primary second molar consecutively resulting in space loss [2]. The second event being space loss predominantly due to the distal movement of the deciduous canine [3]. Hoffding et al in their study concluded that space loss can take place by both mesial and distal movement of the adjacent teeth. [4]. Cuoghi et al concluded in their study that the untimely loss of the mandibular first primary molar in mixed dentition would result in localized space loss unlike the primary second molar which results in deprivation of the total arch length[5]. In the present case we observed a similar situation where localized space loss of about 1.8 mm occurred due to the drifting of both the adjoining teeth.
In the precedent of bilateral premature loss of the primary molars, lingual arch is indicated, however bilateral band and loop is not a definite contraindication. DeBaets and Chiarini et al [6] reported a 1.1 mm increase in the intercanine width with the use of a lower lingual arch as a space maintainer. They stated that this increase was due to lateral drifting of the canines into the leeway space. Therefore the treatment plan was decided to design a unilateral band and bent wire in relation to the missing 84.

Mayne’s space maintainer is a unilateral single arm rigid appliance which is predestined for minimal adjustments [7], in our case we didn’t opt for it because tipping of two teeth needed to be intervened with.

Considering all these reasons, the unilateral band and bent wire design was planned. The patient was under regular follow up for the past 12 months. Good acceptability, without any distortion, cement loss and gingival inflammation was noticed. Adequate stability of the appliance was also appreciated. Uneventful eruption of 44 was noticed after 12 months (Fig 3).

Advantages of this appliance are
a. Simple to fabricate, rigid and stable
b. It can be fabricated on partially erupted tooth and also on the lingually tilted tooth
c. Maintains the space by preventing tipping of the two adjacent teeth

Conclusion:
Space maintainers form an integral part of preventive orthodontics. No individual case is similar, Hence Judgement about the choice and type of space maintainers must be governed by factors available from the literature and the presenting clinical situation. A Pediatric dentist should choose space maintainers on the particular clinical situation, balancing the auxiliary requirements of the patient’s oral status.

References: