ESTHETIC MODIFICATION OF DOUBLE BANDED SPACE MAINTAINER WITH MAYNE'S LOOP – A CASE REPORT

Dr. Bommareddy SaiCharishma[1*], Dr. Shankar Paulindraraj[2], Dr. Trophimus Gnanabagyan Jayakaran[3], Dr. Hemalatha Ramkumar[4]

Article History: Received: 12.12.2022 **Revised:** 29.01.2023 **Accepted:** 15.03.2023

Abstract

Managing the spacefollowing early exfoliation of primary teeth plays vital role in preventing the development of malocclusion at later stages. A conventional space maintainer cannot be applied in all clinical scenarios. This case report describes a unique situation where a traditional band and loop appliance cannot be delivered since the patient was having dental caries in an adjacent canine. To overcome this limitation esthetically modified double banded space maintainer with Mayne's loop was given. Customization of the appliances will be demanded by the various clinical scenarios and treatment ideas changes accordingly.

Keywords: Double-banded space maintainer, Esthetic space maintainer, Composite, Band and bar, modification of space maintainer

[1*]Senior Lecturer, Department of Pediatric and Preventive Dentistry, SRM Dental College, Ramapuram, Chennai
[2]Reader, Department of Pediatric and Preventive Dentistry, SRM Dental College, Ramapuram, Chennai-600087
[3]Reader, Department of Pediatric and Preventive Dentistry, SRM Dental College, Ramapuram, Chennai
[4]Professor and Head, Department of Pediatric and Preventive Dentistry, SRM Dental College, Ramapuram, Chennai.

DOI: 10.31838/ecb/2023.12.s2.029

1. Introduction

Conserving the arch space during untimely exfoliation of primary teeth is extremely important to maintain the arch integrity, prevent the development of malocclusion in mixed dentition,for proper guidance of eruption of the succedaneous tooth, and maintain function and esthetics[1].In cases of early exfoliation of first primary molar, band and loop space maintainer appliance is indicated[2,3]. As all the clinical scenarios might not be the same, modifications of the conventionally opted space maintainers are necessary. Moses J et al.[4] in 2018 reported Mayne's modification of the conventional band and loop in which only the buccal loop was soldered to the band. The present case report describesa modification of the band and bar appliance with Mayne's loop. Thismodified appliance was made esthetically appealing by adding a layer of composite over the band material covering the anterior tooth[4].

Case report

A four-year-oldmale childvisited the department of Pediatric and Preventive Dentistrywith pain in the right and left back tooth region of the jaw for 6 months. On taking history, it was reported that the pain was moderate, localized, non-radiatingaggravating on taking food and relieving on medication. It was the patient's first dental visit with no past medical history and family history. Onexamination the child presented deep carious lesions in 54,55,61,64,65,74,84 and dental caries was seen in 53,52,51,62,63,73,72,71,81,82,83.[fig 1(a), (b), (c)] Diagnosis was made as Severe Early childhood caries. Investigations included radiovisiography in the respective regions and a treatment plan was made. Full mouth rehabilitation was done under the chair side in multiple visits once informed written consent was obtained from the parents. Forceps extraction of 84 and 61 was done under local anesthesia. Pulpectomy and stainless-steel crown were done in 54,55,64,65,74. Pulpectomy followed by composite restoration was done in 73 and 83. Composite restorations were done in maxillary and mandibular anterior teeth. Modified Gropers appliance was luted to replace the extracted 61. Follow-up was done periodically to evaluate the oral hygiene status and to assess the success of appliances luted.[fig 2 (a), (b), (c), (d)]

The primary first molar (84) is extracted and the adjacent canine(83) is compromised as it was pulpectomy treated and restored with composite. In this clinical situation placement of a band and loop space maintainer could displace the restoration on the canine due to undue forces of appliance.A modifieddouble-banded space maintainer with Mayne's loop was fabricated to overcome these limitations.

Fabrication of appliance:[fig 3]

The teeth present adjacent to edentulous spaces 85 and 83 were banded. Impression was taken using alginate impression material. Casts were poured. Mayne's loop was fabricated and soldered to the bands. Post completion of polishing of the appliance, sandblasting was done on the buccal surface of the band of canine. A bonding agent was applied and a flowable composite was placed.

Thorough drying of the primary second molar (85) and primary canine (83) was done. The fabricated appliance was luted using Type I GIC (GC Fuji Gold Label 1 Luting and Lining GIC, GC Manufacturers, GC Corporation, Tokyo, Japan). Regular follow-up was done every 3 months.

2. Discussion

Early childhood caries begins atthe early age of life and can rapidly progressing affecting the child's quality of life in many ways. Treatment of Early childhood caries helps the child to restore function and also improves the overall growth and development of the child[5]. In the present case, as required, full mouth rehabilitation was done with pulpectomies, stainless steel crowns, and composite restoration. Premature exfoliation of the first primary molar often leads to space loss[6]. Hoffding et al concluded that the eruption forces of permanent first molarlead to the potential development of malocclusion if a space maintainer wasn't delivered[7]. Hence the preservation of space at this age is required. Conventionally band and loop space maintainer is indicated in such situations[8]. In the present case, the adjacent primary canine is deeply carious and is treated by pulpectomy and composite restoration. This tooth cannot withstand the forces exhibited by the appliance and can displace the restoration. Hence to prevent this and for additional support and retention primary canine was banded. The esthetic modification with the composite over the band material was done to mask the unappealing appearance of the band.

Mayne's appliance is a unilateral single-arm rigid appliance. It has several advantages over conventional band and loop as it is simple to fabricate, rigid, stable, and more comfortable for the patient in maintaining oral hygiene[7]. Savithri et al 2014 reported the one-year clinical success of Mayne's appliance[9].Odajima T [10] reported that the increase in the arch width in primary dentition is primarily in the region of canines and incisors, and the arch width is almost constant before the mixed dentition growth spurt in molar region. In the present case, the modified space maintainer was planned till the eruption of permanent mandibular

incisors. After the eruption of permanent incisors,the modified space maintainer is removed and lingual arch space maintainer was planned. This helps in preventing the interference of the space maintainer in the growth and development of the dental arches.Considering the age of the patient, probable tongue interference can lead to the displacement of the appliance. Hence, in the present case,Mayne's loop design was chosen as the appliance is rigid, stable, and more comfortable forthe patient.

Uniqueness of case

- Banded on the mesial and distal tooth
- Buccal loop alone (Mayne's loop)
- Composite build-up (on mesial tooth banding) for better esthetics
- Better strength and longevity

3. Conclusion

Clinical scenarios vary for different patients and they undoubtedly demand modifications of conventionally used appliances. This esthetic modification of a double banded space maintainer with Mayne's loop was stable, rigid, and comfortable to the patient and can be applied in cases where the adjacent supporting teeth are deeply carious and compromised.

Acknowledgments: None
Conflicts of Interest: None declared
Ethics approval: Study was approved by the Institutional Ethical Review board of the SRM Dental College, Ramapuram, Chennai,
Funding: Self-funded.
Author contributions: All authors participated in the study design, implementation and writing of the manuscript.

4. References

Shankar P, Venkatesan R, Senthil D, Trophimus J, Arthilakshmi CU, Princy P. Microleakage patterns of glass ionomer cement at cement-band and cement-enamel interfaces in primary teeth. Indian Journal of Dental Research. 2020 Mar 1;31(2):291.

Jalan P, Ghosh A, Zahir S, Kundu GK. Esthetic rehabilitation for premature loss of primary anterior teeth. SRM Journal of Research in Dental Sciences. 2019 Jul 1;10(3):170.

Padma Kumari B, Retnakumari N. Loss of space and changes in the dental arch after premature loss of the lower primary molar: A longitudinal study. J Indian Soc Pedod Prev Dent 2006;24:90-6.

Moses J, Sekar P K, Raj S S, Rangeeth B N, Ravindran S. Modified band and loop space maintainer: Mayne's space maintainer. Int J PedodRehabil 2018;3:84-6

Jayakaran TG, Rekha CV, Annamalai S, Baghkomeh PN. Salivary peptide human neutrophil defensin1–3 and its relationship with early childhood caries. Dental Research Journal. 2020 Nov;17(6):459.

Rao AK, Sarkar S (1999). Changes in the arch length following premature loss of deciduous molars. J Indian Soc Pedod Prev Dent. Mar; 17(1):29-32.

Pushpalatha C, Devi MM, Kamath PS, Shwetha G. A Custom Modified Band And Loop Space Maintainer-A Case Report. Journal of Dental and Orofacial Research. 2016;12(2):30-2.

Ganesh R, Bose S, Moses J. Recreating esthetics in severely mutilated primary teeth-case reports. SRM Journal of Research in Dental Sciences. 2012 Jan 1;3(1):86.

Savitri R, Anandakrishna L, Kamath PS, Ramya M. Mayne's appliance-guidance of eruption: A case report. Int J Med Dent Case Rep 2014. p.1-3

Odajima T. A longitudinal study on growth and development of dental arches of primary, mixed and permanent dentitions. Shikagakuho. Dental Science Reports. 1990 Mar 1;90(3):369-409.

FIGURE LEGENDS

Fig 1: Pre-operative images

Fig 1(a): Maxillary occlusal image

Fig 1(b): Mandibular occlusal image

Fig 1(c): Frontal occlusal image

Fig 2: Post-operative images

Fig 2(a): Maxillary occlusal image

Fig 2(b): Mandibular occlusal image

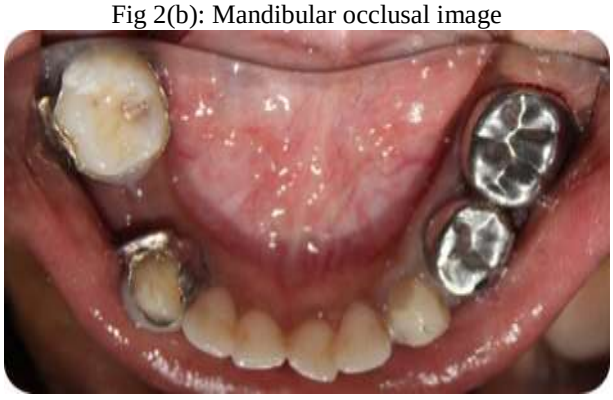

Fig 2(c): Frontal occlusal image

Fig 2(d): Intraoral image of the appliance

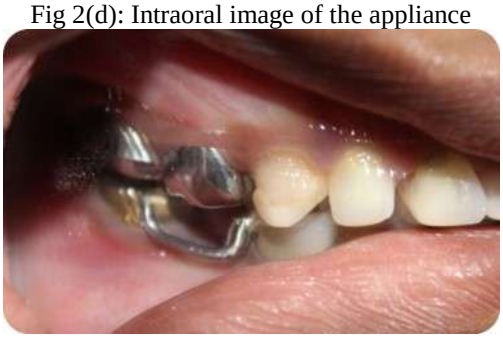

Fig 3: Image of the appliance

FIGURE LEGENDS
Fig 1: Pre-operative images
Fig 1(a): Maxillary occlusal image
Fig 1(b): Mandibular occlusal image
Fig 1(c): Frontal occlusal image
Fig 2: Post-operative images
Fig 2(a): Maxillary occlusal image
Fig 2(b): Mandibular occlusal image
Fig 2(c): Frontal occlusal image
Fig 2(d): Intraoral image of the appliance
Fig 3: Image of the appliance