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Case Report

Utilitarian fixed space maintainer in an 8-year old with multilateral dentoalveolar abscess- A case report

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ABSTRACT

Early exfoliation of primary molars is common among pediatric patients. Construction of a space maintainer should be in accordance with the age of the child and developmental status of the dentition. Pediatric dentists should not only address the space loss but also consider the functional, emotional and hygienic challenges the child might face. The subject was 8 years old and presented with multilateral dentoalveolar abscess and difficulty in chewing. Pain of the involved teeth was addressed through multidisciplinary approach followed by construction of utilitarian fixed space maintainer. The conclusion was that the construction of bilateral utilitarian fixed space maintainer not only addressed the preservation of leeway space but also restored the functional efficacy.

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1. Introduction

Establishment of proper eruption, development of the primary, mixed and permanent dentitions is an indispensable component of global oral health care among children.¹ Oral health of children is generally compromised and if not attended can lead to pulpitis, dental abscess, destruction of surrounding bone and spread of infection through blood stream.² According to Global Burden of Disease Study 2019 by World Health Organization, 520 million children suffer from caries of primary teeth.³

American Academy of Pediatric Dentistry (2019–2020a) recommends space maintainer following premature loss of primary teeth. Leeway space is mostly contributed by primary mandibular 2nd molar.¹

The term utilitarian means functional. Fixed functional lingual arch is advantageous than conventional lingual arch as it offers relative stability, ease of cleaning and allows eruption of permanent teeth without interference.²

Monte-Santo et al. in 2018 and Feu D et al. in 2021 suggested that early loss of primary molars is high and it affected oral health related quality of life (OHRQoL), which included functional limitation and emotional well-being.^{3,4} Current case report explains the design of bilateral utilitarian lingual arch in a patient with multilateral dentoalveolar abscess for improving the OHRQoL.

2. Case Report

Eight year old male patient reported with chief complaint of multilateral dentoalveolar abscess involving mandibular posterior region since 5 days, with difficulty in chewing and no associated extraoral swelling.

Intraorally dentoalveolar abscess was seen in 74,75,84,85 region (Figure 1 a,b,c,d). Intraoral radiographs revealed root stumps of 74, 75 and grossly decayed 84, 85 with periradicular radiolucency suggestive of abscess and with only one- third root completion of the unerupted 34,35,44,45 (Figure 2 a,b). As the patient presented with difficulty in chewing, extraction was undertaken first,

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followed by construction of a bilateral utilitarian lingual arch till the eruption of the succedaneous teeth. In the subsequent appointment band adaptation was done on 36 and 46, alginate impression were made into which the prepared bands were placed and casts were obtained (Figure 3 a).



Fig. 1: a): Frontal view; b): Right lateral view showing denoalveolar abscess # 84, 85; c): Left lateral view showing denoalveolar

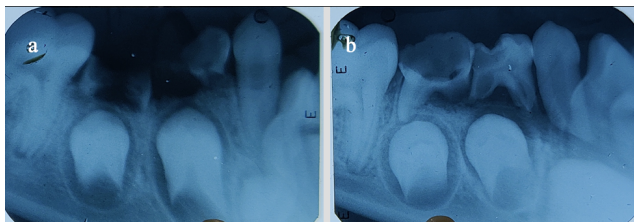


Fig. 2: a): IOPA showing root stumps # 74, 75; b): IOPA showing grossly decayed #84, 85

A lower lingual arch with 2 molar tubes were soldered onto the molar bands using 0.9 mm stainless steel wire (Figure 3 b,c). Acrylic molar teeth to replace 74, 75, 84, 85 were placed on the edentulous area using self-cure acrylic. Molar tube was added on the buccal surface. (Figure 3 d). The appliance was trimmed and polished and 0.9 mm stainless steel wire was passed through the buccal molar tubes which formed the hinge lock (Figure 3 e). The hinges incorporated allowed rotation of the dentulous component (Figure 3 f). The appliance was then cemented (Figure 4 a,b). During each 2 month recall the stainless steel wires that passed through buccal aspect of the molar tubes are cut, the undersurface of the dentulous components are cleaned and the edentulous ridges assessed.

3. Discussion

Dental caries is a multifactorial disease caused due to fermentation of sugar molecules mainly carbohydrates by acidogenic microorganisms in the oral cavity. Inadequate

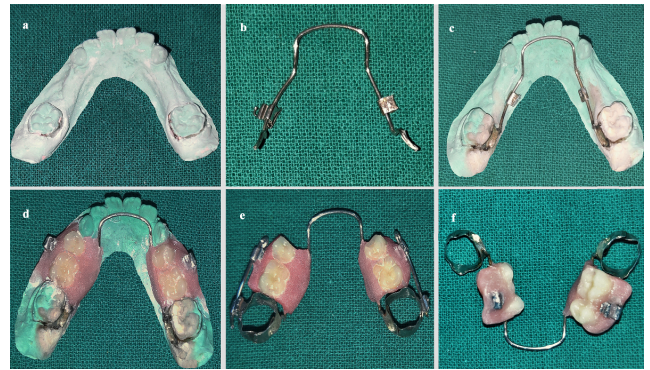


Fig. 3: a): Cast with bands #36 and 46; b): Lingual arch with 2 molar tubes; c): Soldered Lingual arch; d): After acrylization and incorporation of buccal molar tubes; e): Trimmed and polished utilitarian lingual arch with hinge lock; f): Rotation of edentulous component around the hinge



Fig. 4: a): Frontal view of bilateral hinge lock utilitarian lingual arch; b): Mandibular occlusal view of bilateral hinge lock utilitarian lingual arch

fluoride supplements, high sugar intake and poor access to oral health care services are the main reasons for dental caries in primary teeth.^{3,5} In most instances chronic inflammation of the involved tooth are seen. Less often, acute dental abscess is encountered which requires multidisciplinary approach which focuses on pain management, antibiotics, surgical drainage which may require endodontic treatment or extraction followed by space maintainer if necessary.⁶ Observational study by Santanu in 2015 concluded that primary tooth extraction among 6-10 age group accounted for 62.2% and dental caries was the major factor (58.6%).⁷

An ideal space maintainer should maintain the entire space mesiodistally that was lost due to early exfoliation of primary teeth. Construction should be simple, provide sufficient strength to withstand shearing and functional forces and simulate restoration of function as much as possible. Space maintainer should also provide adequate oral hygiene, permit normal growth of the developing permanent teeth, and restrict supra-eruption of opposing teeth and unwanted stress on adjacent teeth.⁸

Leeway space plays a pivotal role in maintaining the space for the alignment of permanent teeth. Maintenance of leeway space is critical in mandibular arch than maxillary due to less potential of arch expansion and difficulty of molar distalization. Therefore, preservation of space due to early exfoliation of primary molars with the help of

space maintainer during transition from mixed to permanent dentition is important to prevent future space loss and anterior crowding.⁹

Case report by Paul Chalakkal et al. in 2017 discussed a similar unilateral functional space maintainer. The utilitarian hinge type of design is advantageous than the conventional lingual arch as it allows for easy and periodic check of the ridge for any mucosal interferences and also timely check for eruption of succedaneous teeth without debanding the space maintainer. The ridge can be visualized by cutting and removing the wire that passes through the buccal aspect of molar tube, later a new wire can be passed to lock the dentulous component. The functional efficacy is restored. The undersurface of the dentulous component can be cleaned periodically which helps in the oral hygiene maintenance and also prevents supra-eruption of opposing teeth.¹⁰ In this case report, child patient was initially presented with pain which affected the emotional well-being. After construction of utilitarian hinge lock lingual arch the difficulty in chewing was resolved and thus this helped to improve the oral health related quality of life.

4. Conclusion

Management of multilateral dentoalveolar abscess requires multidisciplinary approach. This case report explains the need for addressing the functional limitations and improving emotional well-being due to early loss of primary molars. Utilitarian lingual arch is more advantageous over conventional lingual arch. Often non-functional space maintainer is delivered to maintain the leeway space. Thus, this case report highlights the importance of fixed functional space maintainer to improve OHRQoL.

5. Source of Funding

None.


6. Conflict of Interest


None.

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