

Aesthetic Rehabilitation with Fixed Appliance in Primary Dentition

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ABSTRACT

The arch length integrity in the primary, mixed and early permanent dentition is of great significance for the normal development of the occlusion. Premature tooth loss can result in the arch length discrepancy which may lead to malocclusion. Early loss of posterior teeth results in space loss complications while anterior teeth loss result in psychological, functional and aesthetic disturbances which causes negative impact on the behavior of the child. The following case report describes management of severe early childhood caries (S-ECC) with fixed appliance in primary dentition.

Key words: Fixed appliance, aesthetics rehabilitation, severe early childhood caries, functional, primary dentition.

INTRODUCTION

The natural world was made by god and the best creation is the children's smile which may be hampered by early loss of tooth due to lack of knowledge regarding oral hygiene maintenance. Many a time parents and guardian neglect the deciduous teeth thinking that they will exfoliate and new teeth will come in place of that. The premature loss of tooth may be due to early childhood caries, traumatic injury, radiation or developmental defects.

Space loss, generally does not occur in the anterior segment if primary canines are present in the arch. On the other aspect loss of anterior teeth, acts as a major setback for the growing patient because of the aesthetic reasons. It can lead to teasing by peer groups in school causing psychological effect on growing child. The progression of deleterious habits like tongue thrust habit, forward positioning of the tongue is also a concern following premature loss of anterior teeth. It also has impact on speech development and the ability to articulate certain speech sounds, thus affecting the overall personality of the growing child. All these factors necessitate the replacement of the anterior teeth by an appliance that satisfies the aesthetics and functional needs.

CASE REPORT

A four year old boy accompanied by his father reported to the outpatient department of Paedodontics and Preventive dentistry with chief complaint of pain and sinus formation in upper front region of the oral cavity for last 10 days (fig1).



Fig 1: Pretreatment facial profile

There was no other relevant medical or past dental history. Intra-oral examination revealed multiple carious teeth. The patient was advised for an orthopantomogram (OPG) and recalled for treatment. The child was “definitely negative” (Frankl Behaviour Rating) during the first phase of the treatment. The entire treatment protocol was explained including estimated time of treatment and related cost. The parents were satisfied with the proposed treatment plan and a written consent was taken.

The treatment was initiated with fluoride application as a preventive measure to arrest the further invasion of caries and to accustom the patient to the department and environment. Behavior shaping of child was done with Tell-Show-Do (TSD), distraction, desensitization and positive reinforcement. Over the first few appointments, the child confidence and parental separation was gain.

The further visits included invasive procedures such as extraction of 51, 52, 61 and 62 under local anesthesia. Formocresol pulpotomy was performed on 54 and 64 & restored with stainless steel crown. In the last phase of the treatment extraction of 74 and 84 was done under local anesthesia (fig 2).



Fig 2: Pretreatment intraoral view

Considering the age of the child, the appliance was planned which not only restore the form and function but also the aesthetics in anterior region of the upper arch. The option of placement of anterior fixed space maintainer was explained to the parents. Steps in fabrication of appliance (fig 3, 4, 5):



Fig 3: Appliance after acrylization



Fig 4: Post treatment intraoral view



Fig 5: Post treatment maxillary occlusal view

1. Orthodontic bands (0.005inches*0.180inches) were adapted on 55 and 65 followed by upper and lower alginate impression and the bands were secured in the impression.
2. Impression was poured with dental stone and working model was taken out.
3. A 19 gauge stainless steel wire is adapted on palatal arch in U-shaped form, 0.5mm above the palatal surface and distal end of wire was soldered. An anterior tooth wax up with wire framework was completed.
4. The appliance was tried in to ensure the fit, satisfaction, aesthetics and comfort. The same was approved by the patient.
5. The finalized appliance was fabricated in heat cure acrylic and polished prior to delivery.

6. The fixed space maintainer is cemented on 55 and 65 with luting glass ionomer cement and occlusion checked for any premature contact.

A conventional band and loop space maintainer was cemented on tooth 75 and 85 (fig 6, 7).



Fig 6: Band & loop



Fig 7: Intraoral view of Bilateral Band & Loop



Fig 8: Post treatment facial profile

Patient is advised to avoid chewing of hard food up to next 24hours and warm saline mouth gargle for 7 days with proper oral hygiene maintenance followed by check up after every 3months. Parents were well informed that the appliance will be removed by a dentist at an age of approximately 6years, to prevent interference of erupting permanent successors.

DISCUSSION

Pediatric treatment requires mental and emotional preparation of the child. Sometimes, however in case of caries prevention and promotion of oral health worldwide, early primary tooth loss continues to affect many children. The prevalence of primary tooth loss has been estimated to be as high as 28.9%, with a range of 4.3 to 42.6%.¹ So in such type of situation there is a need for immediate interventions to recover the child's functional, esthetics and emotional integrity.

The premature loss of primary teeth due to trauma, caries, ectopic eruption, or other causes may lead to undesirable tooth movements of primary and/or permanent teeth including loss of arch length.² Jytte Pedersen et al, 2006 reported that early loss of primary teeth would result in an increased frequency of sagittal, vertical as well as transversal malocclusion. Hence, wherever possible, restoration of the natural primary tooth should be attempted but in case of extraction or avulsion of the natural tooth, maintenance of the space to guide the eruption of permanent tooth is mandated.

When there is premature loss of deciduous maxillary anterior teeth, the permanent successors may be proclined and thus arch length or perimeter is increased. In case of mandibular cuspid loss an abnormally strong **mentalis** musculature may cause distal drifting of the lateral incisor and shift of midline, deepening the bite. Seward (1965) found the rate of closure of maxillary edentulous space is 1.5mm/year where as 1.0 mm/year in case of mandible. Northway (1984) stated that more space was lost in the first year of extraction than in successive years. Kumari et al (2006) found that the greatest space closure occurs during the first 4 months of the extraction.^{3,4,5}

Anterior dental disharmonies especially interfere with the normal tongue placement which then can lead to the development of maladaptive articulatory habits. Tongue thrust commonly develops when prematurely lost deciduous anterior teeth are not replaced. Yet another consideration is the child's speech development following extraction of all four incisors. Many sounds are made with the tongue touching the lingual side of the maxillary incisors and inappropriate speech compensations can develop if the teeth are missing.⁶

Removable or fixed prosthesis can be used to replace deciduous anterior teeth in children that have been prematurely lost due to disease.⁷ In present case, minimum amount of palatal coverage is done to retain acrylic teeth, causing no or less irritation. Banding of molars done for improved strength instead of bonding. Pink colour of acrylic is used to match with gingiva.

CONCLUSION

Early loss of primary anterior teeth in young children not only affects the speech and function but leads to lack of confidence and self esteem. Anterior aesthetic fixed space maintainer is indeed a solution for such patients because of its acceptability and compliance of wearing the appliance and also improvements of speech, aesthetics and functional needs.

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