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The comeback is stronger than the setback- Dental rehabilitation of a child using Groper's appliance.

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Type of Publication: Case report

Conflicts of Interest: Nil

Abstract

The backbone of Pediatric dental practice is the successful Esthetic rehabilitation of a pre-schooler with missing teeth. It may be either due to trauma or carious lesions that had led to the extraction of a grossly decayed or painful tooth.

Traumatic injuries to the dentoalveolar region among the young children are a tragic but often an ignored problem. Children with injuries to their anterior teeth, and their concerned parents, present a challenge for the dentist that is often unparalleled.

There is perhaps no single dental disturbance that has a greater psychological impact on both the parents and the child than the fracture and the loss of a child's anterior tooth.

In the Pediatric dental practice, the most common lesions in the anterior teeth are due to early childhood caries. It is a unique pattern of caries in very young children due to prolonged or improper feeding habits. The infant may be fed with a nursing bottle containing a high amount of fermentable carbohydrates during sleep. The sugary liquid substrate from the bottle pools around the maxillary incisors. This retentive sugary environ Ment is highly cariogenic. The decreased salivary secretion during sleep, tooth cleaning neglect coupled with unrestricted nocturnal breast feeding increases the risk of acquiring caries. These lesions occur beginning on the labial surface of all anteriors, and they progress rapidly as a diffuse demineralization leading to the gross destruction of all anterior primary teeth.

Loss of masticatory efficiency, compromised esthesis, mis pronunciation of labiodentals sounds, and develop Ment of abnormal oral habits are compromises arising due to the loss of primary anterior teeth at an early age either due to trauma or due to caries. Parental desire is the most decisive factor for the placement of an anterior Esthetic appliance. This unique case report highlights the fabrication of simple, Groper's appliance in a 5-year-old child with premature loss of primary anterior tooth.

Introduction

Loss of anterior teeth in children has a far-reaching impact on the psyche of the children. When these teeth are lost, replacement, and prosthetic management is very important to restore all functions including esthetics of the child.

The replacement should be such that it should not interfere with the eruption process of the underlying successor. Various Esthetic options are available which include removable or fixed partial dentures.

Case Report

A 5-year-old boy reported to the Department of Pedodontics and Preventive dentistry with the chief complaint of missing tooth in the right upper front tooth region for past 1 month.

Patient had sustained a fall at school during play and the tooth had avulsed completely. The parents were more concerned about the esthetics of the child, and they wanted an Esthetic replacement of the missing anterior tooth.

The past dental history revealed that it was the patient's first dental visit. Intraoral examination revealed caries in 75. [Figures1–6].

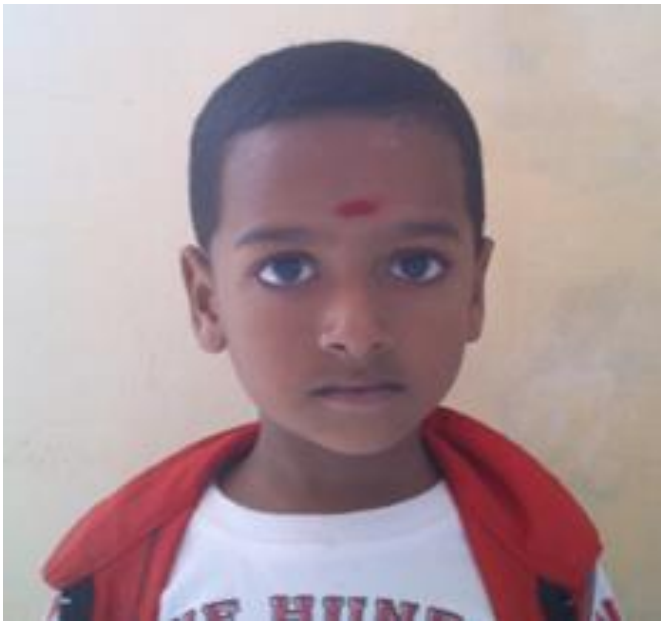

Figure 1: patient profile

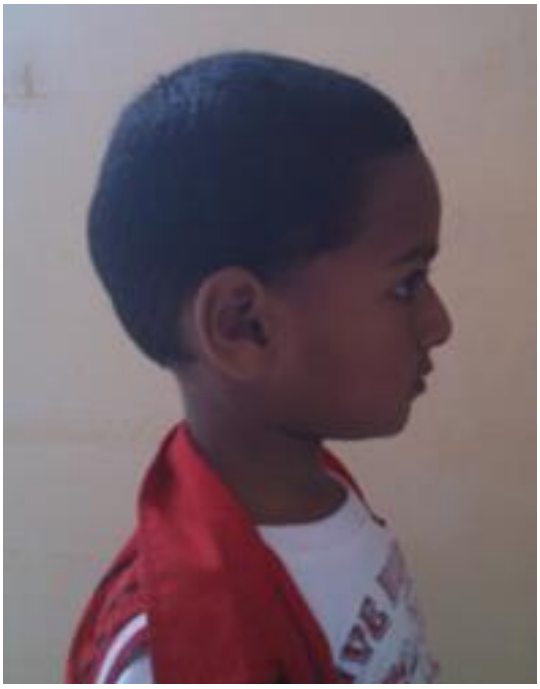

Figure 2: patient lateral profile

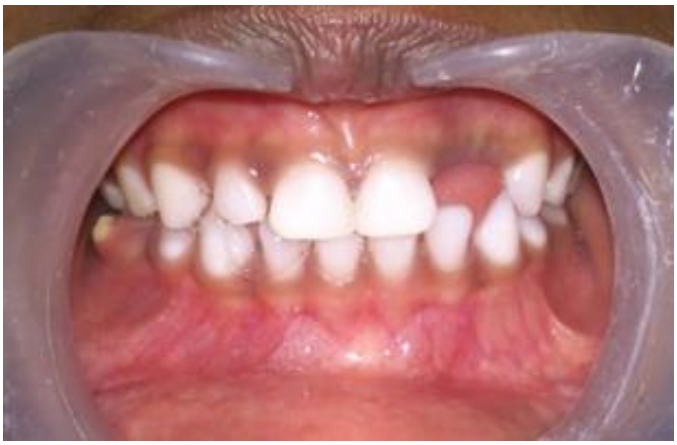

Figure 3: preoperative occlusion

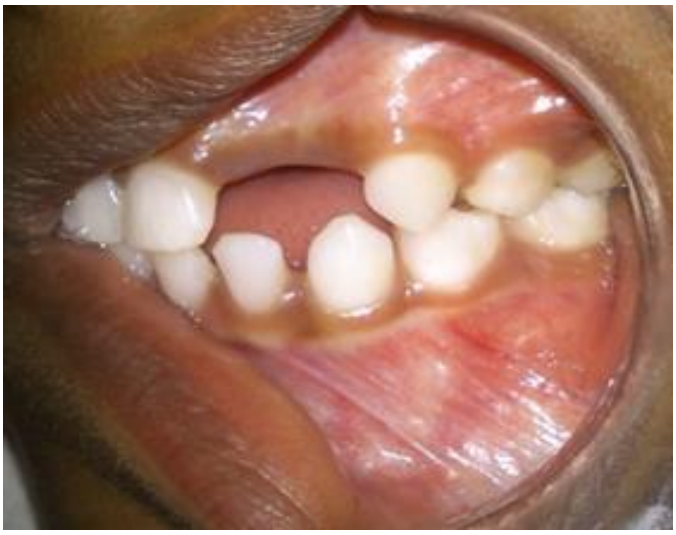

Figure 4: preoperative occlusion on left side

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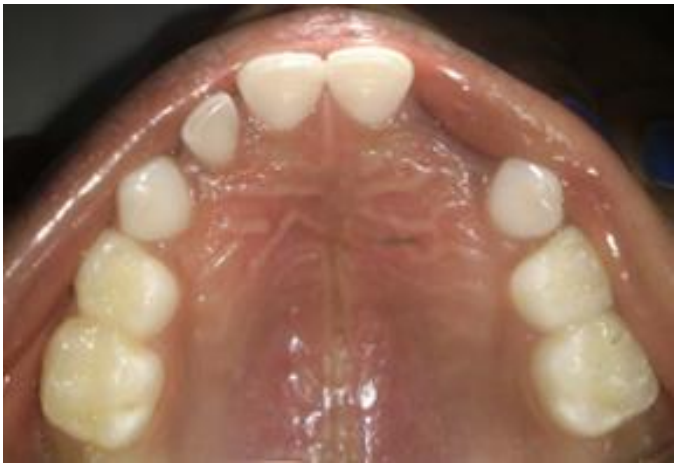

Figure 5: preoperative maxillary arch

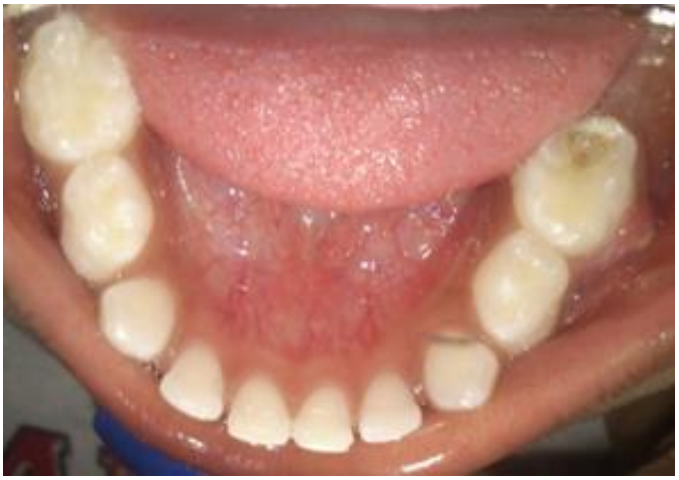

Figure 6: preoperative mandibular arch

Radiographic evaluation

The intraoral periapical radiographs revealed carious lesion involving the enamel and dentine in relation to 75. Glass ionomer restoration was planned for the same.

Groper's appliance

Restoration was done with glass-ionomer cement (GIC) in the carious tooth 75. Various Esthetic options are available for replacement of primary anteriors, but, however, the Groper's appliance was chosen. 55, 65 were chosen as abutments for the anterior space maintainer. The Primary impression was made with irreversible hydrocolloid material - Alginate (3M ESPE; Palagat plus).

Dental casts were poured with Type III gypsum product - Dental stone (Kala Bhai). Band adaptation was done on 55, 65. The appliance is similar to a Nance palatal arch. A small U-shaped projection was formed by the wire that in turn was soldered to the Nance arch wire. Acrylic tooth with light cure composite was attached onto the projection formed by the wire that was soldered to the Nance arch wire. The tooth was placed directly on the alveolar crest making sure that there was no acrylic component extension into the labial vestibule or palate [Figures7–10].

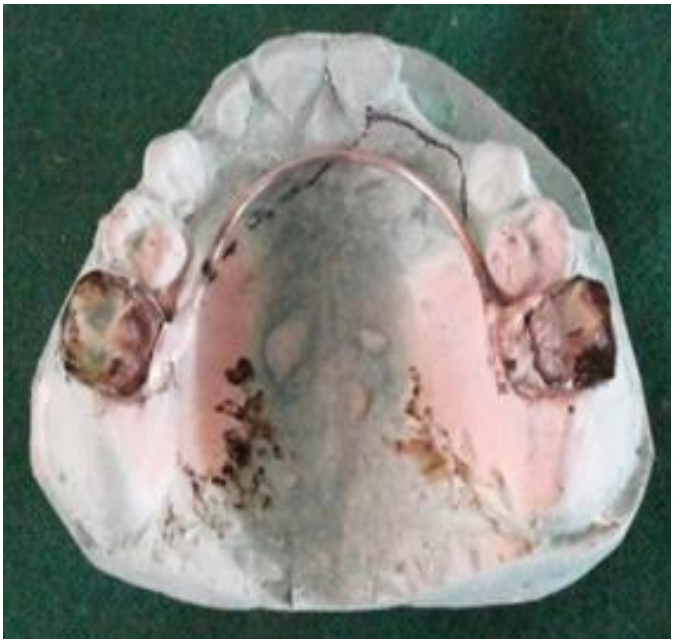

Figure 7: Nance palatal arch wire soldered to the molar bands

Figure 8: small u-shaped wire component attached to the main arch wire

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Figure 9: acrylic tooth attached

Figure 10: acrylic tooth attached with light cure composite

Appointment schedule

First appointment

The impression was made using irreversible hydrocolloid impression material (Plastalgin). Cast was poured using Type III gypsum product (goldstone). Using a die cutting saw, a groove of width 0.5 mm was made on the gingival margin of 55, 65 and band adaptation was done. The "U" shaped wire component was fabricated in the cast similar to the Nance palatal arch. It was soldered to the bands. A second wire component in the shape of a small U was soldered to the main arch wire. To this assembly, acrylic tooth was attached with light cure composite in relation to 62. The final appliance was trimmed, polished and was ready for a try.

Second appointment

The appliance was tried in the patient's mouth and occlusion was checked. The appliance was then cemented using luting GIC with the bands in relation to 55, 65 [Figures 11–13]. The patient was followed up for 3 months.

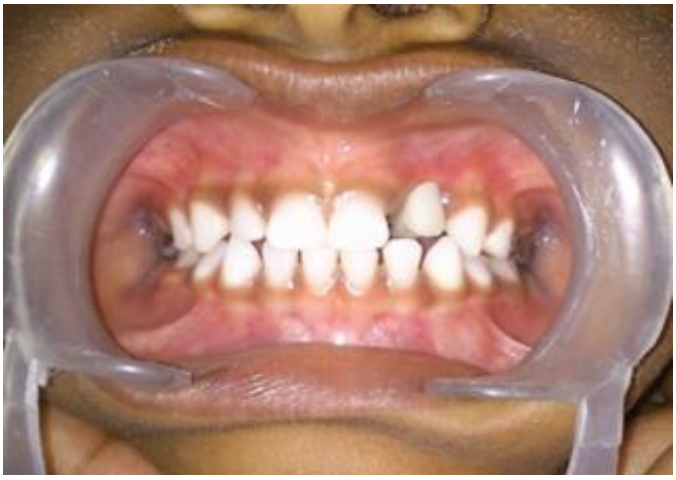

Figure 11: groper's appliance

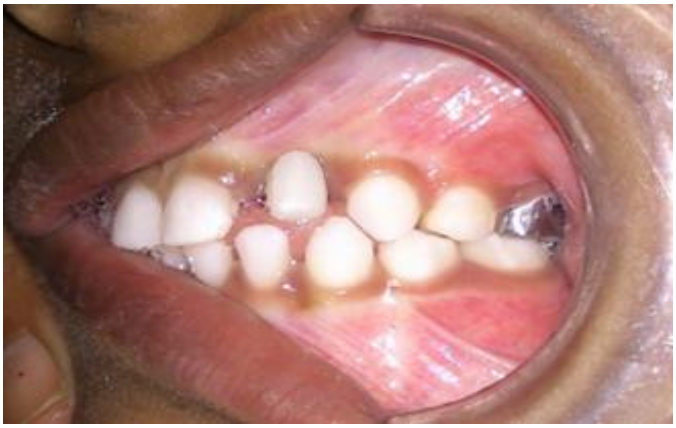

Figure 12: post operative occlusion on the left side

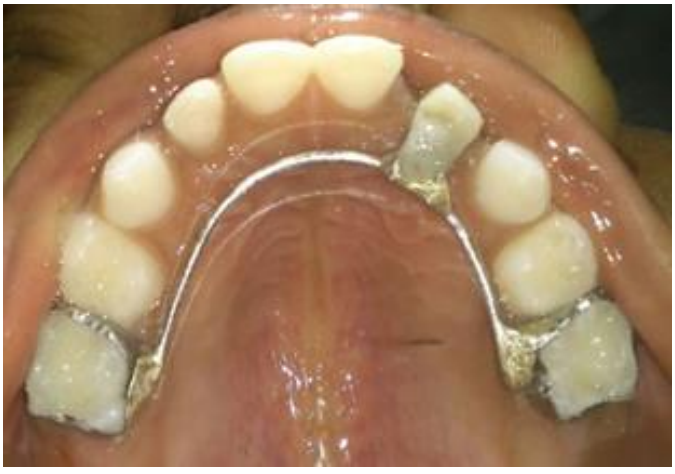

Figure 13: post operative maxillary arch

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Discussion

When treating children who have received traumatic injuries, a sound psychological approach to both the child and the parent is important, as often these present a complex problem. The situation is further complicated with the parents feeling guilty that they were not watching the child or in some way holding themselves responsible for the occurrence. Anxiety regarding the prognosis and particularly regarding the appearance of the child is usually present.

The armored factor for the placement of an anterior Esthetic appliance is a parental desire.[1] There is no strong evidence suggesting that the early loss of the maxillary incisors will cause undesirable effects on the growth and development of the child.[1] However, considerations have to be given regarding the speech problems, masticatory inefficiency, abnormal oral habits, a unesthetic appearance, which follow the loss of anterior teeth at an early age.

Loss of primary incisors after the eruption of primary canines is not an important consideration for space loss though occasionally in a crowded dentition there may be a rearrangement of some anterior teeth.[2,3] Another consideration is the child's speech development following loss of primary incisors. The sounds most frequently in error are the labiolingual sounds. This is because 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.[4]

A study by Riekman and Badrawy reported that the loss of primary anterior teeth before the age of 3 years resulted in speech problems.[5] One of the most considerable and valid reasons for replacing missing anteriors are to restore an Esthetic appearance and thus promote a normal psychological development in the child. When taking all the factors into consideration, if the parents have a desire to replace their child's missing anterior teeth, their wish should not be discouraged.

The Groper's appliance offers several advantages in terms of esthetics, restoration of masticatory and speech efficiency, and prevention of abnormal oral habit development. The main disadvantage is the accumulation of food debris and plaque. Hence, parents have to be instructed to supervise the maintenance of proper oral hygiene in their child.

This paper has offered many considerations for a pediatric dentist when considering replacement of missing primary anterior teeth at an early age.

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