

Modified Groper’s Appliance- Natural is always better than artificial- A Case Report

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Abstract

Introduction: Primary teeth play an important role in maintaining the general health, for mastication, aesthetics, phonetics and psychological comfort of a child. The most common reason for premature loss of upper anterior primary teeth is early childhood caries and trauma. It is very important to replace and manage the early loss of primary teeth to avoid aesthetic and functional concerns.

Case Report: This case report describes about the fabrication of groper’s appliance in a five year old child in a unique way by rehabilitating the patient’s extracted teeth for fabrication of the appliance. Patient extracted teeth were used in fabrication of groper’s appliance as the tooth size, form, shape and colour of the natural teeth is

not compromised and the patient is also more comfortable with the natural smile.

Conclusion: Early loss of primary anterior teeth can not only lead to loss of function and aesthetics, it can also lead to loss of speech and confidence in a child. It is necessary to rehabilitate the missing teeth for restoration of all function and Groper’s appliance is an ideal method to accomplish this rehabilitation

Keywords: Groper’s appliance, primary teeth, natural, aesthetics

Introduction

Deciduous teeth are prized possession of young children and they play a very important role in maintaining child’s quality of life.[1] They are wrongly termed as ‘temporary

teeth', rather they are important in maintaining the general health, for mastication, aesthetics, phonetics and self-esteem and psychological comfort of a child.[2]

The most common reason for premature loss of upper anterior primary teeth is early childhood caries and trauma. It is very important to replace and manage the early loss of primary teeth by prosthesis to restore all functions including aesthetics and psychological development of the child. At the same time it should be important to make sure that the replacement should not interfere with the eruption of permanent successor. [3] In recent times the major concern of the parents is aesthetics hence whenever there is premature tooth loss of primary teeth in the anterior region, aesthetic rehabilitation is of utmost important. Various treatment options such as removable or fixed appliances are considered for esthetic rehabilitation. The advantage of removable appliances is easy maintenance, but in small children their compliance and cooperation is necessary which is difficult to obtain, hence a fixed appliance is preferable. [4]

Groper appliance is the appliance which is used for aesthetic rehabilitation of primary anterior teeth. It is a modification of Nance palatal arch holding appliance with fixed functional space maintainer and is a better option for pediatric age groups.[5]

Groper's appliance is a space maintainer used for children who have lost their primary anterior due to trauma or early childhood caries. It is a fixed partial denture used for aesthetic purposes. This is used to restore mastication and speech, to prevent abnormal oral habit development and also for aesthetics.

The present case report describes about the fabrication of groper's appliance in a unique way by rehabilitating the patient's extracted teeth for fabrication of the appliance.

Case Report

A five year old boy reported to Department of Paediatric and Preventive Dentistry, Mahatma Gandhi Dental College and Hospital, Jaipur with a chief complaint of decayed teeth and purulent discharge from upper front region since 3-4 months. There was no history of pain and the major concern of the patient was aesthetics.

Clinical examination revealed presence of following teeth (according to FDI numbering system)

55 54 53 52 51 61 62 63 64 65

85 84 83 82 81 71 72 73 74 75

Intraoral examination revealed multiple carious teeth (54, 51, 52, 61, 62, 64, 74, 75, 83, 84). Among these 51 and 61 exhibited deep carious lesions with grade 2 mobility. Sinus tract formation was also seen with 61. (Figure 1)



Figure 1: Clinical picture showing caries with respect to 51, 52, 54, 61, 62, 64, 74, 83, 84

Intraoral periapical radiograph of the maxillary anterior region revealed external root resorption with 51 and 61 indicating perapical pathology. (Figure 2)

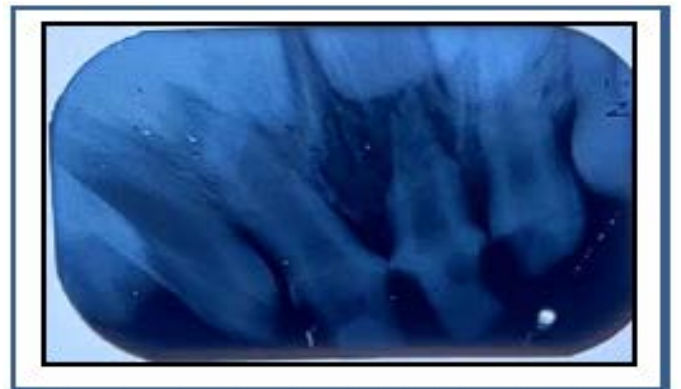


Figure 2: Intraoral Periapical Radiograph

A comprehensive treatment plan was formulated for the patient which comprised of diet counselling, restorative, aesthetic and prosthodontic rehabilitation of the patient.

Groper's appliance was selected for aesthetic and prosthodontic rehabilitation of missing anterior teeth.

The patient's parents were explained about the treatment procedure and a written consent was obtained from the parent before the commencement of the treatment. As per the treatment plan, the patient was explained about the diet and maintenance of oral hygiene. Restorative treatment was done with respect to all the carious teeth (54, 64, 74, 75, 83, 84) using Glass Ionomer Cement (GlasIonomer RX EASE, Shofu). Maxillary left and right lateral incisors were rehabilitated with strip crown (3M, ESPE) and extraction was done with respect to maxillary central incisors. Following extraction, these teeth were cleaned and preserved. All the caries were excavated from both the extracted teeth and were restored with composite resin restoration (Medicept Dental Matrix Microhybrid Composite) so that we can use them for replacement of maxillary teeth in Groper's appliance.

Banding was done on 55 and 65 using band size: 0.005 x 0.180, and alginate impression was taken of both upper and lower arches. Cast was poured using type 3 dental stone (Kalstone). On the upper cast, a stainless steel wire (0.9 mm) framework was made, spanning from one band to the other, while making a small U-shaped loop in the anterior region and the ends of the wire were then soldered to the corresponding molar bands.

The teeth were trimmed to the desired lateral sizes and waxed up teeth arrangement was done. Indexing was done from 52 to 62 using dental plaster for guidance of proper teeth position, dewaxing was done and acrylization was done using cold cure acrylic. The appliance was finished and polished. The prosthesis was cemented with type I Glass Ionomer cement. (GlasIonomer RX EASE, Shofu) (Figure 3). Occlusion was checked after insertion and post insertion instructions was given to the patient and parent to maintain proper oral hygiene, avoid

chewing on anything hard and stick, proper brushing and flossing. Patient was recalled after 24 hours for check-up and was advised for follow up after three months.



Figure 3: Post-operative picture showing Groper's appliance given in the maxillary arch with 51, 61 and strip crown with 52,62

Discussion

Premature loss of teeth can lead to various dental and psychological problems. The dental problems could result in over eruption of opposing teeth, tipping of adjacent teeth, shift in midline, and collapse of arch due to linguo distal inclination of teeth leading to parafunctional habits. The psychological problems could be due to compromised aesthetics which influence the progress of the child in school. It is very important to replace the premature loss of anterior primary teeth to restore all the functions such as speech, aesthetics, mastication and for proper psychological development of the child. Careful consideration should be taken during treatment planning or decision making for placement of any space maintainer in incisor segment.[6]

According to Ravindran V et al [7], the prevalence of Groper's Appliance was found to be 39.6% with the common age of Groper's appliance being used for 3 years old. There was a male predilection among the prevalence of Groper's appliances.

Chala P et al [8] fabricated a fixed dentulous appliance for replacing missing anterior teeth and concluded that restoration of aesthetics and function of anterior teeth

gave a psychological boost for the child. Parihar V et al [9] described a simple technique of fixed type anterior aesthetic appliance in a 4 year old female patient with missing upper central incisors.

Goneka P et al [10] described about a simple technique of use of fibre reinforced composite resin for fabrication of fixed esthetic functional space maintainer.

Bhargava S et al [11] described a simple, economical, and fast method to replace a single tooth utilizing a prefabricated composite resin framework reinforced with polyethylene fiber and the existing tooth as pontic.

In the present case, patient extracted teeth were used in groper's appliance because the tooth size, form, shape and colour of the natural teeth cannot be obtained by artificial acrylic teeth. Also, as the natural teeth were used, the speech rehabilitation was done, speech of the patient was not compromised and the patient was more satisfied with the aesthetic appearance.

Aesthetic space maintainer has been found to have a much wider acceptability and compliance of wearing the appliance by the pediatric dental patients. This is a solution to pediatric anterior edentulous arches with compromised speech, aesthetic, and behavior of the child including poor social acceptance.⁶ The probable limitations of Groper's appliance could be long-term follow-up, improper oral hygiene maintenance and frequent breakage. Among these most of the factors can be managed by long term recall and follow up of the patient.[12]

Conclusion

Early loss of primary anterior teeth can not only lead to loss of function and esthetics, it can also lead to loss of speech and confidence in a child. This problem may become serious and may lead to imbalance emotional development of the child. Thus, to prevent a child from all such compromises, we have rehabilitated the missing

anterior primary teeth of the child using groper's appliance. At the same time we have used the natural teeth so as to maintain the natural appearance of the child. Also, this appliance is very easy to manage if proper instructions are given to the patient and patient is recalled on regular follow up visits.

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