

Esthetic Management Of An Anterior Avulsed Primary Teeth With Groper's Appliance In A 3 Year Old Child: A Case Report

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Abstract

Avulsion and luxation account for upto 7.2% of injuries in the primary dentition. A range of treatment options are available that can help conserve the tooth after a traumatic episode. Following the traumatic loss of an anterior tooth it is important that an immediate replacement is provided in order to avoid esthetic, masticatory and phonetic difficulties and to maintain the edentulous space to avoid arch length discrepancy. The loss of an anterior tooth in a child or young adolescent may present a difficult prosthetic problem.³ This problem can be managed in several ways. In this article a fixed Groper's appliance was fabricated by using the patient's natural clinical crown from the avulsed teeth. This measure proved to be a very adequate, esthetic treatment solution before a permanent restorative plan could be developed in the future.

Keywords: Avulsion, Anterior primary teeth, Esthetic, Groper's appliance

INTRODUCTION:

According to the world health organization (WHO) classification of dental injuries, avulsion is the complete displacement of the tooth from its alveolar socket.¹ The aesthetic recovery in the preschooler who has experienced numerous tooth loss due to serious dental trauma or rampant early childhood caries (ECC) is the biggest obstacle for the dentist.² The consequences being faced are loss of teeth and various dental diseases besides lifelong aesthetic issues. The parents with different economic status would rather seek solution to the high aesthetic concern of the children.³

Primary teeth are wrongly denoted as "temporary teeth" despite being very important for a child's overall health, mastication, aesthetics pronunciation, personality, emotional well-being etc. Primary teeth have a major impact on one's quality of life. Early loss of primary anterior teeth impacts a child's growing dentition and presents a number of physiological and psychological problems.⁴

Prosthetic replacement of deciduous teeth is exceptionally important when a child has lost his/her deciduous teeth at a young age. To restore all functionality, including the child's aesthetics and mental advancement, the replacement should be designed in such a way the space maintainer does not interfere with the underlying successor teeth's eruption process. Removable or fixed functional space maintainers are the aesthetic solutions available for early loss of teeth. Fixed space maintainers are recommended because removable space maintainers are less desirable in young children due to issues with dental hygiene and relying on the child's compliance and cooperation to wear them.⁵ In recent years due to increased demands for aesthetics from parents, fixed functional space maintainers are the perfect solution for replacing deciduous anterior teeth that have prematurely exfoliated.⁴ The present paper reports utilization of the natural teeth for Esthetic Management of an Anterior Avulsed Primary teeth with modified Groper's appliance in a 3 year old child.

CASE REPORT:

A 3 year old girl, was referred to the Department of pediatric and preventive dentistry, after a fall, while climbing the

grilled door that resulted in dental trauma. The trauma occurred 12 hours ago. The child had already been seen by the medical staff of the emergency unit of a local hospital who had detected no neurological damage or medical complications. Her parents had let the avulsed teeth dry in a piece of paper and brought it to the clinic. Any concomitant systemic disease is not defined by the patient's parents. The intraoral examination revealed that all the maxillary anterior primary teeth (51, 52, 61, 62) were (Figure 1)



Figure 1: Intraoral view and Avulsed anterior primary teeth

Radiographic Examination: OPG revealed missing 51, 52, 61 and 62. The underlying tooth-like structure indicated the presence of 11 and 21 at 5th Nolla's stage. The remaining alveolar bone thickness from the underlying tooth structure to the crest was measured to be 4 mm. (Figure 2)



Figure 2: Ortho pan tomogram

Preoperative photographs



FRONTAL VIEW OCCLUSAL VIEW

Treatment Plan- Considering the clinical, radiographic findings, chief complaint and diagnosis, a treatment plan was decided. Patient's parents were explained about the appliance design for rehabilitation of the missing 51, 52, 61 and 62, and an informed consent was obtained. Though there are many appliances available for aesthetic rehabilitation of primary anterior tooth, Groper's appliance is considered more successful and comfortable for this patient. Groper's appliance was designed with the utilization of natural teeth which replaced the missing teeth, and act as a space maintainer.

In First Appointment- Prefabricated stainless steel molar bands of size 32+ were adapted on 55 and 65 and impression

was taken using alginate.

Lab Procedure: Groper’s appliance fabrication

Cast was poured with Type III gypsum product-Dental stone. Extending from one band to other band, a stainless steel wire (1.00 mm) framework was made and wire ends were then soldered to the corresponding molar bands of the maxillary teeth. (Figure 3)After applying separating media, the cold cure acrylic material being flowed from the palatal area to the labial vestibule and extended to the posterior 64 region over the arch wire. The avulsed tooth was rinsed in normal saline, and the natural tooth was sectioned in a horizontal plane at the level of the cement-enamel junction (Figure 4) with the help of an abrasive disk under constant irrigation. Complete extirpation of the pulp was done from the cervical area. The crown portion was then contoured with a flame-shaped air-rotor bur. (Figure 4) the entire pulp chamber was etched with 37% phosphoric acid, followed by rinsing for 15 seconds and attached to the U loops created with acrylic resin with 1mm of gingival clearance. (Figure 5) After fabrication of the appliance, it was removed from the cast and ready for an intraoral try-in. (Figure 5)

In Second Appointment: Required adjustment, trimming and polishing was done, and finally, appliance was cemented with luting GIC through the molar band on 55 and 65.(Figure 8)The patientwas instructed to maintain proper oral hygiene especially cleaning of acrylic area afterevery meal. The patient was also instructed to visit after 1 month for follow-up and in case of any breakage of appliance, report immediately. The patient was then followed every month for three successive months and problem of accumulation of food debris and plaque was observed.

APPLIANCE DESIGN AND FABRICATION-



Figure 3: Gypsum model



Figure 4: Outline of the natural teethafter sectioning



Figure 5: View of the Groper's appliance with natural teeth before cementation



Figure 6: Preoperative



Figure 7: Postoperative



Figure 8: Occlusal view



Figure 9: Frontal view

DISCUSSION:

Losing deciduous anterior teeth before the age of three might cause speech difficulties. Missing primary anterior teeth should be replaced for several reasons; one of the most important reason is that it helps children's psychological development by restoring their appearance.⁵

Parental desire is one of the main decisive factors for treating these types of clinical situations.⁶ Different types of appliance have been developed to manage the space including-

1. a provisional removable partial denture replacing the missing tooth (teeth);
2. a provisional fixed acrylic bridge utilizing the adjacent teeth as full crownabutments; or
3. a bonded bridge using either a denture tooth, or a chairside fabricated compositesresin tooth as the tooth replacement.⁷

Fixed acid-etch bridging may offer several advantages over removable appliances including enhanced esthetics, ease of use and avoidance of becoming accustomed to a removable prosthesis.⁶

The Groper appliance was developed in 1984 to minimize the aesthetic and functional consequences of early anterior tooth loss. The appliance is similar to a Nance holding arch, but instead of a palatal acrylic button in the rugae region, it uses acrylic plastic teeth coupled to a wire. A legitimate purpose to replace lost incisors is to restore a natural and pleasant look and so allow for appropriate psychological development. The primary drawback is that food debris accumulates. So, patients and their parents must be thoroughly educated on the value of dental hygiene.⁸

Aswanth et al. (2014) placed an anterior fixed functional space maintainer in a 4 1/2-year-old boy following extraction of severely decaying 52, 51, 61 and 62 teeth due to complaints of an unpleasant appearance, malnutrition, and altered speech. According to them, the aesthetic space maintainer is seamless and provides conformance when used by a young child patient.⁹

A similar appliance was mentioned by Jasmine and Groper, in which plastic teeth were attached to metal cleats that were soldered to the palatal wire bar instead of being attached to acrylic, as it was in our design.¹⁰

In this case report patient achieved pleasant appearance with the help of her own natural teeth because this space

maintainer has numerous benefits, including improved aesthetics, improved masticatory, speaking efficiency and protection against the formation of undesirable mouth habits. The demerit of this appliance is the build-up of plaque and food particles. As a result, parents must be taught how to oversee their children's oral hygiene upkeep.⁴

CONCLUSION:

The technique described in this article suggests a new treatment option for the replacement of a missing anterior tooth with the help of natural teeth. This technique restores aesthetics and function. It is more comfortable for the young patient than a removable appliance. The child's self-esteem enhanced when the Groper's appliance restored his anterior aesthetics and function in only a few months. The patient and his parents were also given oral hygiene guidelines to practice at home.

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