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Aesthetic Replacement For Missing Primary Teeth- A Novel Approach

Dr. Jyothsna V Setty*, Dr. Ila Srinivasan, Dr. Arihanth Bhandary

Department of Pedodontics and Preventive Dentistry, MR Ambedkar Dental College, Bangalore, India

Case Report

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*For Correspondence

Dr. Jyothsna V Setty, Professor,
Department of Pedodontics and
Preventive Dentistry, MR Ambedkar Dental
College, Bangalore, India, 560005.

E-mail: jyothsnavsetty@yahoo.com

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ABSTRACT

A Pediatric Dentist's greatest restorative challenge is the esthetic rehabilitation of a pre-schooler, who has lost anterior tooth/teeth subsequent to early childhood caries or extensive dental trauma. An anterior esthetic fixed or removable appliance is often the choice to replace lost tooth/teeth. Other important considerations replacing anterior teeth may include problems in speech and development of pernicious oral habits. The options presently available have their own limitations like poor patient compliance or retention of the appliance. Thus this paper discusses about modification of latest splint- it type of fiber reinforced composite (FRC) space maintainer with combination of orthodontic wires to aid in retention and longevity of the appliance.

INTRODUCTION

In the modern civilized, cosmetically conscious world, well contoured, and aligned teeth are the standards of beauty indicating nutritional health, self-esteem, economic status. Many treatment approaches have been proposed to address esthetics and retention of missing anterior primary teeth. Few studies have shown various appliance designs^[1] but scarce information is available to aid the clinician for an appropriate appliance design, retention and longevity.

Premature loss of primary teeth apart from being aesthetically displeasing can cause oral habits, speech problems and also a lot of psychological implications on growing child^[2]. Treatment of choice in such situations may be removable functional/fixed functional esthetic space maintainer. Compliance in wearing removable functional space maintainer with a young child is often questionable. Hence various designs of fixed functional esthetic space maintainers are being used in pediatric dental practice with variable limitations in success rates.

This article is an attempt to present a novel design of anterior aesthetic replacement in a preschooler using FRC and orthodontic wire.

CASE REPORT

A male patient aged four years, reported to the Department of Pedodontics and Preventive Dentistry, M.R Ambedkar Dental College and Hospital, Bangalore, Karnataka, India, with a chief complaint of mobility and bleeding while brushing from his upper front tooth region since one month. He gave a history of fall nine months back while playing in his house (**Figure 1**).



Figure 1. Clinical findings showed enamel fracture with discoloration and mobility with respect to 51 and intra oral periapical radiograph showed severe external root resorption.

As the tooth could not be saved endodontically, extraction was done to be followed by replacement of the same. Initially splint it type of space maintainer was used with biologic restoration, which lasted only for ten days due to the debonding between composite-tooth interface. Since the patient reported back with lost restoration, pontic was fabricated using strip crown, and retention was planned by a combination of mechanical and chemical bonding using orthodontic wires and FRC. Initial impressions were made, and frame work was fabricated using 19 gauge stainless steel wire (**Figure 2**), extending from disto-labial line angle of 52 to disto-labial line angle of 61 with the extension into the missing tooth area to provide additional retention for the pontic to be fabricated (**Figure 2**).



Figure 2. Retentive grooves were also made on the extensions of the wire frame work on to the abutment teeth and the part extending into the pontic.

Morphology of the pontic was obtained using strip crown form. The required length of the fiber reinforcement was used to bond the pontic with abutments using flowable composite palatally. Labially the extension wires of the framework were bonded using flowable composite (**Figure 3**). Patient was recalled every three months for evaluation. It was also noticed that the child's psychological morale was up and had improved his confidence and self-esteem.



Figure 3. The follow-up of 18 months showed good success with the appliance.

DISCUSSION

Placement of anterior aesthetic space maintainer is based strongly on both patients and parents desire ^[3]. Although removable space maintainer has certain advantages, such as being easier to clean and allowing better maintenance of oral hygiene, they may be removed and worn at the whim of the patient and may be broken or lost easily and also if they are not used properly will not be effective either ^[4].

In contrast, fixed appliance with proper design is less damaging to oral tissues and can be worn continuously for a longer period. It has been reported that a well-designed fixed appliance is more preferable than a removable appliance to both patient and the dentist ^[5]. Fixed anterior bridges/ Gropers appliances have a lingual arch wire soldered to bands placed on second primary molars which require laboratory procedure and may be considered for multiple anterior teeth loss. Splint-it space maintainers have many advantages, including fast insertion, no laboratory costs, limited patient cooperation, no risk of causing damage to abutment teeth, preventing tipping of abutment teeth, don't hamper tooth eruption, and high durability rate ^[6,7]. However at the end of six months the failure rate of this type of space maintainer was 73%. Artun et al. ^[6] and 94% Zuhail ^[8] and lasted only for 6 months according to Jain N ^[9] and Srinivas et al. ^[10].

Thus considering the failure of the FRC splint-it type of space maintainer, a modification in the appliance design using orthodontic wires supporting pontic on the labial side of the abutment teeth and FRC on the palatal side of the abutment teeth was included. This appliance thus used both mechanical as well as adhesive bonding technique for retention which provided better longevity.

CONCLUSION

In view of the case discussed here the use of FRC and orthodontic wire combination utilizing both mechanical and chemical

bonding between the components of the appliance and the teeth may be the reason for additional retention offered by this design. This approach may be a valuable clinical consideration while replacing the lost anterior tooth in a preschooler.

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