

# Removable Functional Space Maintainer for Esthetic Rehabilitation of a Child with Severe Early Childhood Caries

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## Abstract

Early childhood caries causing early loss of teeth resulting in compromised esthetics, function, and malocclusion is one of the dreaded but frequently encountered situations in pediatric patients. Here, we report a case in which extraction of badly carious primary anterior and posterior teeth was done followed by rehabilitation with removable space maintainer to establish esthetics and function in a five-year-old boy.

**Keywords:** Early childhood caries, esthetics, removable space maintainer

## INTRODUCTION

Esthetic rehabilitation subsequent to anterior tooth loss, and management of space and function subsequent to posterior tooth loss in young children is a major challenge for the pediatric dentists. Early childhood caries (ECC), known previously as baby bottle caries, nursing bottle caries, baby bottle tooth decay, or nursing decay describes rampant dental caries in infants and toddlers.<sup>[1]</sup> Most of the times, ECC is the culprit for the early loss of teeth in young children. ECC, when associated with the bottle feeding habit, is characterized as first affecting the primary maxillary anterior teeth, followed by the involvement of the primary molars. The extent of decay is almost always more severe in the maxillary anteriors, and by the time the child is brought to the dentist, much of the anterior clinical crowns are badly carious or lost.<sup>[1]</sup> Preventive and restorative treatment is preferred as compared to rehabilitative treatment for carious primary teeth. However, most of the times, the patient reports late and the only option left is extraction of the carious teeth followed by rehabilitation of the esthetics and function. This case report illustrates an interim removable functional space maintainer for badly carious primary maxillary incisors and nonfunctional space maintainer for primary maxillary molars in a five-year-old boy.

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## CASE REPORT

A five-year-old boy reported with chief complaint of decayed upper front teeth. There was history of night time bottle feeding until the patient was three years of age. On examination, the patient had unaesthetic smile caused due to multiple grossly carious anterior teeth [Figure 1]. Intraoral examination revealed carious 54, 61, 64; root stumps of 52, 51; missing 62 with mild amount of debris and plaque in both the maxillary and mandibular teeth [Figures 2-4].

Based on the history and clinical examination, the diagnosis of severe ECC (S-ECC) was made. Orthopantomogram (OPG) revealed root resorption of 52, 51, 61 and crown formation of 12, 11, 21, 22 at different stages. Radiolucency involving enamel and deeper dentin of 54, and root resorption of 64 were also evident in the OPG [Figure 5]. Before treatment, the child's behavior was negative (-) (Frankl behavior rating).

Informed consent and assent for the treatment procedures was taken from the patient party. Behavior shaping was started and topical fluoride application was done in the first appointment. On the follow-up visits, restoration of all carious teeth and

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**Figure 1:** Preoperative extraoral view.



**Figure 2:** Preoperative intraoral frontal view.



**Figure 3:** Preoperative maxillary occlusal view.



**Figure 4:** Preoperative mandibular occlusal view.



**Figure 5:** Preoperative orthopantomogram.

indirect pulp capping followed by stainless steel crown on 54 were completed. Space maintainer was planned for the edentulous area which would restore form and esthetics in anterior region, and prevent space loss in posterior region. Maxillary and mandibular impressions were made using hydrocolloid impression material (Dentsply India, Pvt. Ltd) and working casts were prepared. Fabrication of the removable appliance was done on the maxillary arch which consisted of functional space maintainer for anterior and nonfunctional space maintainer for posterior edentulous space. Extraction of 52, 51, 61 was done under local anesthesia [Figure 6] followed by the insertion of the space maintainer on the day of extraction

of 64 [Figure 7]. Esthetics was restored after the insertion of space maintainer [Figures 8 and 9].

## DISCUSSION

Premature loss of primary anterior teeth as early as five years of age often causes esthetic compromise, poor self-esteem, and development of tongue thrusting habit. Speech is not significantly affected as it develops between the age of 18–36 months.<sup>[2,3]</sup> However, the importance of restoring esthetics of a growing child should never be underestimated for an appropriate psychological unfolding of the child.

According to Waggoner and Kupietzky, “first, the strongest factor for placing an anterior esthetic appliance is parental desire. While space maintenance, masticatory function, speech development, and tongue habits may be of some consideration, there is no strong evidence that early loss of maxillary incisors will have any significant, long-lasting effect on the growth and development of the child.”<sup>[1]</sup> The choice can be either a removable or a fixed appliance, which can be functional or nonfunctional.<sup>[2,3]</sup> The selection of the appliance depends on a number of factors including the child’s stage of dental development, dental arch involved, tooth missing, status of the teeth adjacent to the lost tooth compliance, appliance integrity, maintenance, modifiability, etc.<sup>[3]</sup> The prosthetic treatment should always be aimed towards providing good occlusal stability, esthetics, phonation and mastication. These factors instill greater self confidence in the child and help him gain acceptance.<sup>[4]</sup>



**Figure 6:** Intraoperative maxillary occlusal view.



**Figure 7:** Postoperative maxillary occlusal view.



**Figure 8:** Postoperative intraoral frontal view.



**Figure 9:** Postoperative extraoral view.

In case maxillary incisors are missing, many clinicians go with the placement of Gropper's appliance, fixed esthetic space maintainer, pontic fiber reinforced prosthesis, or even removable partial denture.<sup>[2,5]</sup> In case of removable appliances, there is essentially one design with various modifications.<sup>[6]</sup> The main advantage of fixed over removable appliance is the elimination of patient factor. To improve patient acceptance, esthetic functional fixed appliance is reliable.<sup>[3]</sup> The removable space maintainers cover large area of oral tissue which sometimes cause irritation to soft tissues and discomfort. However, removable space maintainers are cost-effective and with proper patient and parents counseling coupled with strong motivation, removable space maintainers fairly justify for the viable treatment options.

Maintaining space in the posterior region due to premature primary tooth loss at this age is very important because there are chances of space loss leading to the failure of eruption of succeeding permanent teeth, supra-eruption of antagonistic teeth, and even compromised masticatory function. The maintenance of space should be done as early as possible using removable or fixed space maintainers. In the present case, nonfunctional space maintainer was given in the posterior region because there already was supra-eruption of antagonistic teeth.

## CONCLUSIONS

Anterior edentulous spaces due to premature loss of primary teeth are usually neglected because of minimal chance of space loss in this area. However, considering the growing

child and his/her priority for esthetics mainly, rehabilitation of anterior edentulous space holds equal importance when compared to the maintenance of space in the posterior edentulous areas. In the author's view, restoration of esthetics in the present case must have had something to do with the magical transformation of the unfriendly, angry child into a friendly and a confident one.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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