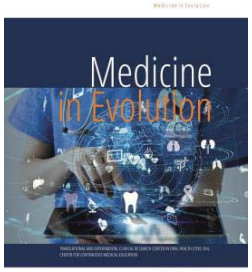
Improving the aesthetic and functional appearance of a 4-year-old patient using a removable space maintainer – case report



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Abstract

A case of a 4-year-old male patient with a history of trauma in the anterior area, is presented after he received an aesthetic removable space maintainer. The removable space maintainer manages to restore the aesthetic, phonatory, masticatory function, preventing the installation of parafunctional oral habits and social stigma.

Keywords: aesthetics, space maintainer, paediatric patient

INTRODUCTION

Premature loss of temporary anterior teeth due to trauma as avulsion, extraction of traumatic injured teeth or teeth affected by accelerated resorption has a prevalence ranging from 5.8-19.4%[1]. The premature loss of primary teeth is a common problem in pediatric dentistry, because it leads to loss of arch integrity and adversely affecting the proper alignment of permanent successors [2].

Hence, space maintainers (SM) are used to maintain the space [3]. The aesthetic removable space maintainer (RSM) is in a way a SM, designed to use as support the nearby primary molars as abutment, with an aesthetic part of artificial incisors. Their application is recommended by paediatric dentists to improve the aesthetics and functional function [4].

There are various advantages to use an RSM [5], including preserving the proximal lengths of spaces, while maintaining the vertical height therefore restoring the aesthetics of the teeth [6], preventing speech disorders [7], and eliminating habits such as thumb or lip sucking, unilateral chewing. The manufacture of RSMs is complicated, because requires experienced technicians. Thus, the shortage of artificial deciduous teeth, artificial permanent teeth are usually modified to reproduce the functionality of deciduous teeth. In most of the time, they do not accurately simulate their morphology.

Tooth loss can also affect the child's speech and aesthetics when they tend to cover and hide the missing teeth, behavior that can lead to a restricted lip and jaw movement, while speaking. An anterior edentulous space can cause a maladaptive articulatory habit or may initiate a tongue thrust pattern [8].

Aim and objectives

The purpose of this study is to evaluate the performance of a modified removable SM. The prosthodontic rehabilitation of an anterior teeth loss requires important consideration in order to restore aesthetics and function. This case report describes a case of a 4-year-old patient who lost teeth 5.1, 5.2, 6.1, 6.2 where a removable functional space maintainer was used to rehabilitate the lost functions.

MATERIALS AND METHODS

Patient Case Selection

Early loss of frontal primary teeth, where the paediatric patient requires a functional SM.

Case Description

A 4-year-old male patient presented to the Department of Pediatric Dentistry, with a chief complaint of front region early loss of teeth 5.2, 5.1, 6.1, 6.2 due to a traumatic event 3 months ago (Fig 1). On clinical and radiographic examination (Fig. 2), the absence of the four incisors was confirmed and the decision to place an aesthetic functional SM was taken.

Figure 1. Anterior edentulous space

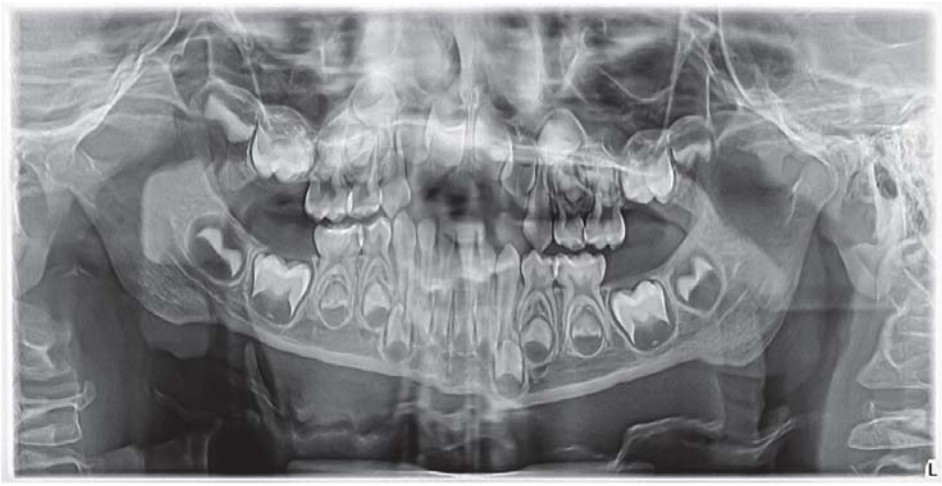

Figure 2. Radiographic examination

The aesthetic removable space maintainer was fabricated by the orthodontic dental technician with the following components: framework from cold cured acrylic, median jackscrew, lateral clasps and artificial teeth. (Fig 3).

Figure 3. Clinical appearance after aesthetic removable SM

Design and Fabrication

- Upper and lower impressions were taken. The occlusion was determined on the cast. Artificial teeth were trimmed to an appropriate size and then placed on the edentulous area at the correct occlusion.
- The wire served to provide retention to the appliance on the abutment primary molars

- The base palate was formed of cold-cure acrylic resin to cover the palatal surface (Fig.4).

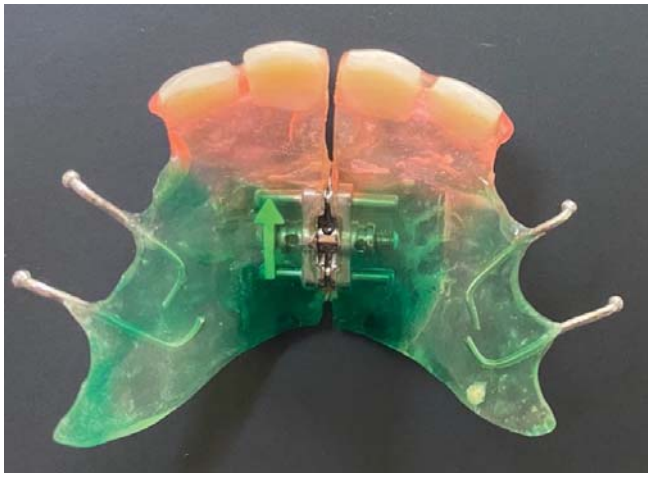

Figure 4. Aesthetic removable space maintainer

DISCUSSIONS

As paediatric patients are usually anxious, their extent of cooperation is limited. Therefore, this will lead to a challenging situation for the restoration of badly decayed primary teeth [9]. The space will close in the first 6 months after tooth removal in the lateral area and it is best to place the SM immediately, in the anterior area no space loss appears but the aesthetics is disrupted. Permanent teeth usually require 4-5 months to progress through 1mm of bone [10]. According to a study the loss of space can take place by both mesial and distal movement of the adjacent teeth [11]. However no single case is related about the choice of SMs, thus the type of removable functional SM is ruled by the presenting clinical scenario [12]. An ideal appliance should be easily reproductible, restoring as much of the natural function of the tooth. The material should be affordable and have the longevity to secure till required. Also the appliance should not interfere with the normal eruption process [13].

A removable SM is easier to clean than a fixed SM, allowing a better preservation of oral hygiene and may be used at the will of patient. Contrary, a fixed appliance is less susceptible to cause injury to the oral tissues and are used continuously for a longer period [14]. In some cases, obtaining retention is difficult as none of the permanent teeth have erupted or are in various stages of eruption. The current modification of SM was found to accomplish all the criteria. The appliance was easy to fabricate depending on the needs of each patient. Some removable SM sometime requires clap adjustment and even some acrylic modification to maintain good retention and allow eruption of the underlying permanent teeth. Most of the fixed appliances only serve to maintain the arch length. The present design helps restoring not only the missing teeth, aesthetics but also the function. The retention of this appliance is easy to obtain, and the small children are quite compliant in wearing it all the time. The major issue its relations to growth. In the follow-up visits, it was seen that the SM did not suppress growth and kept on fitting whenever there was any change in the dentition [14,15].

Supervision and periodic follow-up visits at 3, 6 and 12 months showed that the modified removable SM had no undesirable effect on the growth, hence to the jackscrew activated every 2 months.

CONCLUSIONS

The present design of the aesthetic removable SM is simple and easy to fabricate. It requires less chairside time and as a consequence it increase the compliance of the paediatric patient. It does not supress the growth and it is a suitable appliance for maintaining the aesthetics as well as function.

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