

Short communication

Modification of maxillary splint for simultaneous protraction and esthetic rehabilitation of anterior teeth

ABSTRACT

Cleft lip and palate (CLP) patients struggle from multiple limitations, both functionally and esthetically, impeding their social and psychological development. These patients adapt fairly to the functional requirements, but esthetic aspect is always compromised, which play a significant role in their overall development and their acceptance in the society. Early rehabilitation of the esthetic component in the form of replacement of the missing anterior teeth has a positive impact on the quality of life of these patients, which is usually neglected in the early phase of orthodontic treatment. This paper attempts to address the esthetic aspect of CLP patient with a clinical modification of conventional treatment modality.

Keywords: Cleft lip and palate, esthetics, maxillary splint

INTRODUCTION

Restoration of patients with unilateral or bilateral cleft lip and palate (CLP) with missing anterior teeth and deficient alveolar ridge presents a challenging task for an orthodontist.^[1] Patients with facial clefts experience the stigma mainly due to growth reduction of the maxilla, causing a typical concave facial profile,^[2] esthetic deficiencies of maxillary anterior teeth, and speech problems. Specific rehabilitation strategy should be tailor-made for each patient together with meticulous treatment planning by the orthodontists at an early stage for a normal physical and psychosocial development of the patient. Face mask therapy with bonded maxillary splint for protracting the retrognathic maxilla is the treatment of choice in growing CLP patients.^[3] However, replacement of missing anterior teeth is not usually carried out along with this framework, leading to impaired facial esthetics during the period of maxillary protraction and subsequent consolidation period. This paper presents a modified maxillary splint for simultaneous protraction and rehabilitation of missing anterior teeth for early esthetic improvement in CLP patients.

FABRICATION OF APPLIANCE

Impression of the maxillary arch with the molar and premolar bands was recorded using alginate impression material, and casts were poured in type II dental stone. Hyrax expansion screw (11 mm) was adapted on the palatal surface. A 1-mm stainless steel wire was adapted bilaterally around maxillary molar and premolars for added stability. Hooks were fabricated from 1-mm stainless steel wire in between canine and first premolar area for face mask traction. The entire assembly was soldered to get a unified framework [Figure 1a]. Fabricated assembly was transferred to patient's mouth, pick-up impression was made, and casts

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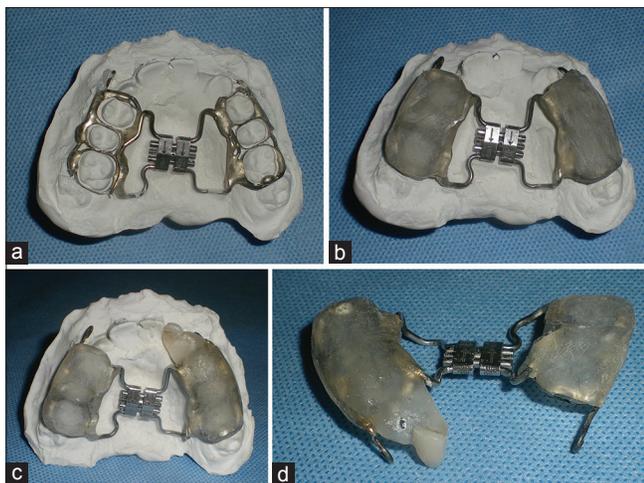


Figure 1: (a) Hyrax expansion screw soldered with molar and premolar bands, (b) maxillary splint with acrylic on occlusal surface of banded teeth (molar and premolars), (c) maxillary splint with selected missing tooth incorporated in it, (d) final splint after trimming and polishing

were poured in orthocal dental stone. Occlusal surface of the banded teeth (molar and premolars) were covered with acrylic to form maxillary splint with occlusal ramp [Figure 1b]. Missing tooth (maxillary left lateral incisor) was selected after shade matching and incorporated in the splint with an acrylic extension [Figure 1c]. The esthetically modified splint was trimmed, polished [Figure 1d], and cemented in patients' mouth [Figure 2a and b].

DISCUSSION

Oral rehabilitation of individuals with CLP is related to the degree of anatomical and functional malformations along with the age of the patient reported at the time of treatment.^[4,5] Children with CLP deal with a multitude of limitations, both functionally and esthetically, hampering their social and psychological needs. These patients adapt well to the functional requirements, but esthetic aspect is always compromised, which play a significant role in their overall development. Early restoration of esthetics has a positive impact on the quality of life of these patients which is usually neglected in the early phase of orthodontic treatment. Hence, modification in the maxillary splint was designed for simultaneous replacement of the missing tooth and also assistance in protraction by facemask therapy to address the sagittal discrepancy of maxilla. As presented in this article, our modification has a simple design, easy

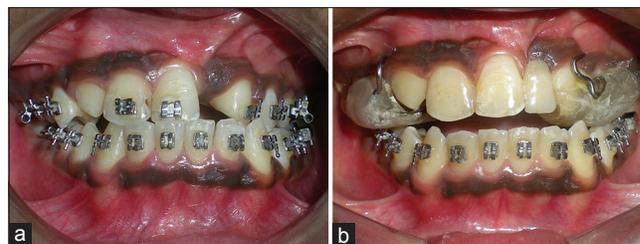


Figure 2: (a) Without maxillary splint *in situ*, (b) maxillary splint *in situ* with anterior tooth replacement

fabrication, affordable, along with patient comfort aiding rehabilitation, resulting in immediate improvement in the esthetics and speech of the patient. Once expansion and protraction phase is finished, the same tooth will be used as a riding pontic during leveling and alignment phase. Finally, the missing tooth will be replaced by a definitive prosthesis.

CONCLUSION

This clinical modification of maxillary splint may prove advantageous to CLP patients because of its ease of fabrication and economical design along with massive clinical relevance targeting psychosocial well-being and improvement of speech for these patients.

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Conflicts of interest

There are no conflicts of interest.

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