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# APOS Trends in Orthodontics

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Twin-Star: Adding a new dimension for treatment of Class II noncompliant patients

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Abstract

The orthodontist of today faces the herculean task in getting kids to wear myofunctional appliances. Even the Twin-Block, which is claimed to be one of the most patient friendly appliances, is not so easily accepted by the growing child of the 21st century. An innovative modification of the Twin-Block called Twin-Star is hereby presented. Compared with the traditionally constructed Twin-Block, the Twin-Star proves to be esthetically superior, with a higher level of comfort and is less bulky (as it is palate free) and hence easily accepted by the patient. It is a boon to the orthodontist too as it can be made in a single sitting by the orthodontist himself.

Key words: Chairside, innovative, invisible, myofunctional appliance, Twin-Block

INTRODUCTION

Twin-Block is a versatile and effective appliance introduced by Clark in 1982[1] used for the correction of Class II malocclusion.[2-5] It has stood the test of time and has remained popular over the last two decades.[6] However, over the years, the hallmarks of comfort and acceptance have changed and in the present scenario, the emphasis is more on patient’s aesthetics and comfort rather than only on mechanical or biological superiority. It has been widely seen that aesthetics and comfort play a major role in increasing the patient compliance, which is of ultimate concern to the orthodontist to achieve optimum results. We orthodontists find young patients reluctant to wear a Twin-Block because of either social or psychological reasons.

An innovative method has been devised in which a Twin-Block can be fabricated chair side in a single sitting with the help of a Biostar unit (Biostar® VI with Scan Technology, Great Lakes Tonawanda, NY) or any other pressure molding unit. This unique Twin-Block, which we have called “Twin-Star,” is made using a Biocryl sheet (Clear Splint Biocryl 1 mm round, Great Lakes Tonawanda, NY). It is patient friendly, as it has a perfect fit, is less bulky (palate free), has no wire components and above all it can be easily fabricated by the orthodontist himself.

MATERIALS AND METHODS

Materials required

• A pressure molding machine (e.g., Biostar).
• Biocryl sheet of 1 mm thickness.
• Cold cure clear acrylic.
• Preformed upper and lower acrylic blocks (3-5 mm height).
• Carbide bur and steel disc.
• Pumice.

Step-by-step procedure

• Make excellent alginate impressions of both the arches.
• Immediately pour the impressions in orthodontic stone Type III used for orthodontic models.
• When separated, trim maxillary and mandibular models to a horseshoe shape with the help of a palatal router and allow to dry.
• Paint a separating medium (Great Lakes separator, Great Lakes Tonawanda, NY) on the models, which will prevent plaster from sticking to the thermoplastic material.
• Place the Biocryl sheet in the pressure molding machine and turn on the heat source. As the material gets hot it will begin to sag. The secret to uniform adaptation is getting the material evenly heated. It should sag (1/4”) one quarter before being vacuum formed over the model [Figure 1a].
• When the material is ready, pull it down over the model and turn the suction on.
• The thermoplastic material will retain heat for a while. To ensure complete cooling run the model under water or let it set for at least 5 min. Now these well-fitting trays are ready for trimming [Figure 1b and c].
• They can be trimmed with a steel disc and removed from the models.
• Wax bite is recorded in the traditional manner [Figure 2a-c].

The acrylic upper and lower blocks can either be constructed now or prefabricated beforehand and kept ready.
• The upper block covers the second premolar, first molar and the second molar [Figure 3a].
• The lower block extends from distal half of the canine to the mesial half of the second premolar [Figure 3b].
• Adjust the blocks in the patient’s mouth so that lower block interlocks with the upper at an angle of 70°, having at least 5-6 mm of thickness to help maintain the forward position of the mandible.
• After the adjustment is done, mark this position and with cold cure fix them in the upper and lower splints [Figure 4].
• Upper and lower splints with block in place [Figure 3c].
• The appliance can be polished using pumice in the usual way and is now ready to be fitted in the patient’s mouth [Figure 5].
• Patient is instructed to wear it for 24 h.

Figure 1: (a) Heating process in pressure molding unit (b) upper splint (c) lower splint
Figure 2: Bite recorded (a) right lateral view (b) left lateral view (c) frontal view
Figure 3: (a) Upper block prepared on upper splint (b) lower block prepared on lower splint (c) upper and lower splints with block in place
Figure 4: Upper and lower blocks in place (a) frontal view (b) right lateral view (c) left lateral view
CASE REPORT

- A 12-year-old male patient reported to the Department of Orthodontics, Ahmedabad Dental College, Ahmedabad, India with a chief complaint of forwardly placed upper front teeth.
- On extraoral clinical examination, it was found that he had a convex profile, retruded chin position, posterior facial divergence, decreased clinical FMA, deep mentolabial sulcus and hypotonic lips [Figure 6a].
- A clinical VTO was performed which was found to be positive.
- On intraoral clinical examination, the overjet was 8 mm and overbite was 7 mm, molar relationship was Class II on the right and left sides and the canine relationship on the right side was Class II [Figures 7a and 8a].
- Lateral cephalogram showed retrognathic mandible, reduced Frankfurt’s mandibular plane angle (FMA), average to horizontal growth pattern. [Figure 9a]. Orthopantogram showed presence of all teeth, symmetrical dental development on both sides and adequate alveolar support to the teeth [Figure 10a].
- The patient was diagnosed as having Angle’s Class II malocclusion on skeletal Class II bases with orthognathic maxilla and retrognathic mandible. The growth pattern was average to horizontal, upper and lower incisors were proclined and crowded. An increased overjet and overbite was also present [Table 1].
- The ideal treatment plan was non-extraction two phase treatment. First phase consisted of myofunctional appliance therapy using Twin-Star, followed by fixed appliance in the second phase.
- The skeletal correction was achieved after wearing the appliance for 10 months, which was followed by a retention phase of 3 months [Table 1].
- Post-treatment extraoral clinical examination showed that, there was pleasing improvement in facial appearance, a straight profile, average chin position, and lip competency was achieved [Figure 6b].
- Post-treatment intraoral clinical examination showed that, overjet was corrected and overbite was reduced, molar and canine relationships were Class I bilaterally. [Figure 7b and 8b].
- Orthopantogram showed eruption of premolars [Figure 10b].

Figure 5: The finished appliance in the mouth (a) maxilla (b) mandible (c) frontal view (d) right lateral view (e) left lateral view

Figure 6: Extraoral photographs (a) pre-treatment (b) post-treatment

Figure 7: Intraoral photographs (a) pre-treatment (b) post-treatment

Figure 8: Maxillary arch and mandibular arch (a) pre-treatment (b) post-treatment
• Post-treatment lateral cephalogram showed positive growth response during treatment with significant increase in mandibular length and a resultant improvement in mandibular retrusion [Figure 9b].

• Sella nasion line was used as reference line for Superimpositions of pretreatment and posttreatment cephalograms which showed forward movement of point B by 3 mm and achievement of class I molar relationship. [Figure 11].

Advantages

• This appliance can be fabricated chair side in a single sitting.

• The appliance is esthetically appealing to the patient.

• It offers optimum patient comfort hence patient compliance is good.

• The speech is better as palate remains free and there are no wire components present.

• Retention and fit is excellent.

• Incisal capping is present; hence proclination of lower incisors\textsuperscript{[10]} is prevented.

CONCLUSION

An attempt has been made to modify a myofunctional appliance in a way that is beneficial to the patient, as it proves to be comfortable, esthetic and well-fitting and can be fabricated in a single sitting at the chairside. The construction of other functional appliances also in this manner will make it simple for us to treat a greater number of patients who require growth modulation therapy. As we embark on “orthodontics next generation” we owe it to our patients to make treatment more pleasant in the years to come.

REFERENCES


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