

Functional Jaw Orthopedics with Fixed Mechanotherapy for Esthetic Results

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Abstract

Class II malocclusions can manifest in various skeletal and dental configurations. Most Class II patients have a deficiency in the anteroposterior position of the mandible. Several treatment options are available for managing Class II problems, and functional appliances have been used for many years. The Twin Block Appliance (TBA) is a functional appliance used in the correction of Class II malocclusions,¹ and has been described by patients as being comfortable to wear. The effectiveness of the Twin-block appliance is probably related to its reduced demand on patient tolerance as compared with some other functional appliances, which results in a higher rate of patient acceptance. This article discusses a report of two patients with class II skeletal malocclusion treated with twin block appliance along with fixed mechanotherapy.

Keywords: Class II malocclusion, Twin Block appliance, Functional appliance.

Introduction

Functional appliances are thought to correct malocclusions by guiding and directing the movement of the jaws and teeth. The success of treatment depends upon patient cooperation, as this has a direct correlation with the extent of correction of the malocclusion.¹ The Twin Block Appliance (TBA) is a functional appliance used in the correction of Class II malocclusions¹ and has been described by patients as being comfortable to wear.² This appliance was developed more than 20 years ago by Dr. William J. Clark^{1,3} in Scotland. The TBA can give good results relatively quickly, depending on patient cooperation⁴ and has been considered to be advantageous when compared with other types of functional appliances such as the Bass or Bionator appliances. It is perhaps for these reasons that the TBA has become a popular choice of corrective appliance for growth guidance in Class II division I malocclusion.^{5,6}

The TBA consists of mandibular and maxillary bite blocks that have inclined edges, meeting at an interlocking angle, to induce occlusal forces that guide the growth of the dental arches.² It has been claimed that this method of treatment stimulates growth of the mandible while simultaneously restricting growth of the maxilla, particularly if combined with extra-oral traction.¹ In previous studies, the mandible has been putatively shown to increase in length and height following TBA treatment,^{4,7,8} but there is equal evidence against this hypothesis.⁹

This article discusses a case report of two

patients with class II malocclusion treated with twin block along with fixed mechanotherapy.

Case Report I

A 13 yr old female patient reported with chief complaint of difficulty in chewing, presented with class II div 2 pattern. Intraoral features included retroclined upper anteriors, buccally placed right canine, scissor bite in relation to upper right first premolar, Angles class II molar and canine relation bilaterally, with deep bite and square shaped upper arch. Extraoral features included acute nasolabial angle and convex profile. (Fig. 1,2)

The case was analysed and was decided to treat with fixed appliance along with twin block. The patient was bonded with 0.022 MBT SL smart clip brackets. After leveling and alignment with 0.019x0.025 SS wire Twin block appliance was fabricated. After 6months of appliance wear class II elastics were given to settle the occlusion. Upper Hawley appliance with anterior slope/ Rick-A-Nator was given for retention. Lower fixed spiral wire retainer was bonded.

Case Report II

A sixteen year old female patient came with the chief complaint of difficulty in eating, presented with class II div I pattern. Intraoral features include Angles class II molar and canine relation bilaterally, increased overjet, deep overbite, crowding in lower arch. Extraoral features included retruded mandible, decreased lower facial height and convex profile. (Fig.5,6)

The case was analysed and was decided to treat with fixed appliance along with twin block. The patient was bonded with 0.022 MBT SL smart clip brackets. After leveling with 0.019x0.025 SS wire, Twin Block appliance was delivered. The appliance was removed after eight months of wear and patient was started on class II elastics. Rick - A - Nator was given for retention and lower fixed spiral wire retainer was bonded.

Discussion

Class II malocclusions can manifest in various skeletal and dental configurations. Most Class II patients have a deficiency in the anteroposterior position of the mandible.¹⁰

Several treatment options are available for managing Class II problems, and functional appliances have been used for many years in the treatment of Class II Division I malocclusions.

Several varieties of functional appliances are currently in use that aim to improve skeletal imbalances. Alteration of maxillary growth, possible improvement in mandibular growth and position, and change in dental and

muscular relationships are the, expected effects of these functional appliances.

The goal of functional appliance therapy is to encourage or to redirect the growth in a favorable direction. Several functional appliances are presented in the literature for the correction of Class II division I malocclusion. The major differences in the effects between various orthopedic appliances are mainly related to the technique of fabrication, construction bites, and hours of wear. Among various removable and fixed functional appliances, the twin-block and Herbst appliance, respectively, are most efficient in correcting a Class II malocclusion.¹¹

William Clark designed a functional appliance called the twin-block, which effectively modifies the occlusal inclined plane to induce favorably directed occlusal forces by causing a functional mandibular displacement. These bite blocks are designed for full-time wear to take advantage of all functional forces applied to the dentition, including the forces of mastication. Clark pointed out that the functional mechanism of twin-blocks shows a great similarity with the neutral dentition. It is functional during appliance wear, it offers the possibility of usage along with fixed appliances, and it has the advantages of all functional forces due to full-time wear.¹²

Several studies have shown that a Twin-block appliance is a very effective tool in the correction of Class II malocclusions. The effectiveness of the Twin-block appliance is probably related to its reduced demand on patient tolerance as compared with some other functional appliances, which results in a higher rate of patient acceptance. Illing et al showed the appliance to be advantageous in terms of its rapidity of correction, compared with Bass and bionator appliances.¹³

Aesthetic improvement is highly valued by patients seeking orthodontic treatment (Dann et al. 1995). Subjects with a Class II malocclusion are a good example of patients who are referred to orthodontists primarily for aesthetic improvement (Dann et al. 1995). In growing patients, two-phase treatment of Class II skeletal malocclusions, which includes growth modification with functional appliances followed by orthodontic treatment with fixed appliances, has been advocated as an appropriate treatment approach (Keeling et al., 1998 ; Tulloch et al. 2004). As with all orthodontic treatment modalities, the primary goals of growth modification are both to correct the skeletal discrepancy and to achieve optimal facial aesthetics. Twin Block



(TB) is a popular functional appliance is due to its simple design and ease of use, the TB can be worn 24 hours a day and takes full advantage of all the functional forces applied to the dentition, including those of mastication. Another advantage of the TB is that it can be used with fixed appliances (Clark, 1982, 2002).¹⁴

Twin-block was used in these cases because a recent survey showed that it is the most popular functional appliance in the United Kingdom.⁵

The Twin Block appliance, provided mandibular growth increments greater in magnitude than do other removable functional appliances. In addition, the direction of the mandibular growth was favorable and thus contributed substantially to the anteroposterior skeletal correction.

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malocclusions. timing of the appliance therapy at the peak of the pubertal growth spurt played a crucial role, contributing more skeletal effect for molar and overjet correction in the treatment of Class II Division 1 malocclusions.

By coupling fixed appliances with a removable twin block esthetic results were obtained. (Fig. 3,4 and 6,7)

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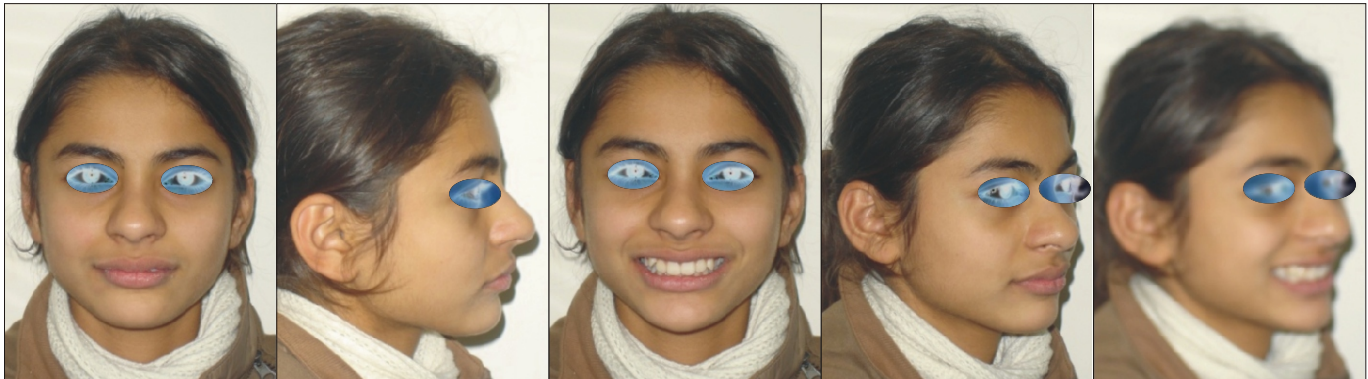


Fig 1.Pretreatment Extraoral photographs (case 1)



Fig 2.Pretreatment Intraoral photographs (case 1)

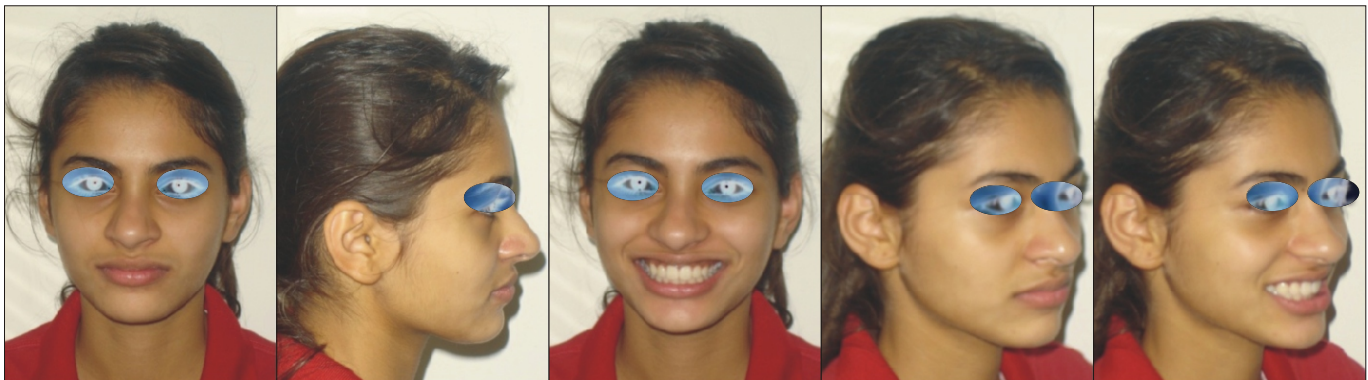


Fig 3. Post treatment extraoral photographs (case 1)





Fig.4 Post treatment intraoral photographs (case 1)



Fig 5. Pretreatment extraoral photographs (case 2)



Fig 6. Pretreatment intraoral photographs (case 2)

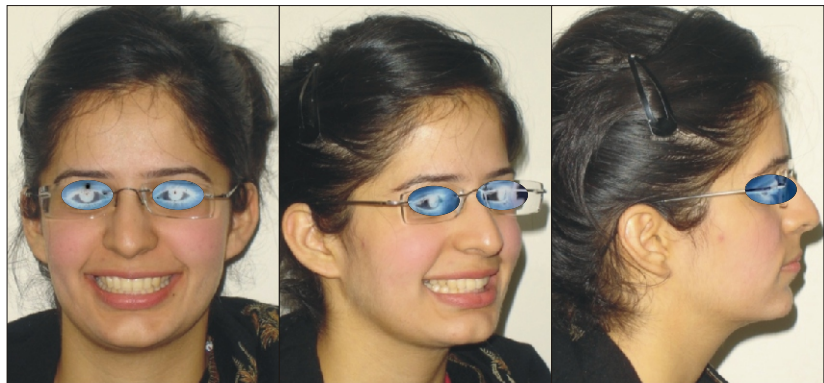


Fig 7. Post treatment extraoral photographs (case 2)



Fig 8. Post treatment intraoral photographs (case 2)

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