Class II Correction Using Twin Block Appliance: A Case Report

ABSTRACT

The aim of this study was to see the effect of twin block appliance in permanent dentition phase. Twin block from its inception and evolution of the appliance itself has been widely accepted as a more competent Class II corrector compared to earlier bulky monopoly appliances. The effect of the twin block functional appliances is mostly dental alveolar having a small skeletal effect. Functional appliances can be used successfully in growing patient with certain Class II malocclusion. It is dependent on patient’s compliance. It also simplifies the fixed appliance phase. A 13-year-old girl was treated with twin block appliance. The design of appliance and treatment results were demonstrated in following case report. In permanent dentition, twin block appliance produces a similar effect as in mixed dentition phase. With proper case selection and good patient cooperation, we can obtain a significant result with twin block appliance.

Keywords: Class II, Functional Appliance, Skeletal Maturation, Twin Block.

1. INTRODUCTION

Functional appliances are those orthodontic appliances which produce skeletal and dental change using forces generated by muscles. Since a long time, these appliances have been used in clinical orthodontic and also extensively featured in the various literature \(^1\). In 1982, Clark described the twin block appliance. In the United Kingdom, it was one of the popular functional appliances. Many pieces of evidence suggest that it may be considered as one of the most successful appliances for the treatment of skeletal Class II malocclusions. How much amount of mandible should be advanced for the construction of twin block is still not clear. A bite registration is mostly taken with the incisors edge-to-edge relation. Many authors have suggested that greater orthopedic effect can be achieved by advancing the bite gradually. It produces less incisor tilting in cases such as Class II division I \(^2,3\). The following is a case report of a 13-year-old girl treated with twin block appliance.

2. CASE REPORT

A 13-year-old girl came to the Orthodontic department having a chief complaint of upper front teeth placed forwardly. On extraoral examination, the patient had a convex profile, incompetent lips with an interlabial gap of 5 mm, acute nasolabial angle, receded chin position and deep mentolabial sulcus, and horizontal growth pattern (Fig.1). On intra-oral examination, it showed end on molar relation and canine relation bilaterally, overjet of 7 mm, and upper and lower midlines coincide with the facial midline (Fig.2).

The case was diagnosed as Class II skeletal malocclusion with mandibular deficiency and maxillary dental proclamation. The cephalometric analysis confirmed the diagnosis of division I on skeletal Class II base (Fig.3). Patient has horizontal growth pattern and mandibular retrusion. Evaluation of patient’s cervical radiograph indicated that she was at the peak of a pubertal growth spurt with a considerable amount of growth remaining. In addition to this, the patient shows positive visual treatment objective.
2.1 Treatment Objectives

- Reduction of profile convexity and lip incompetence.
- Correction of molar and canine relation.
- Achievement of normal overjet and overbite.
2.2 Treatment Plan
As the patient had skeletal and dental Class II relationship in growing phase (cervical vertebrae maturation indicators 2), growth modification was planned using functional appliance followed by the fixed orthodontic appliance for the final detailing of occlusion.

2.3 Treatment Progress
Twin block was fabricated for the patient (Figure 4). After an 11 months period of wear, significant improvement was noted in profile and lip competency (Figure 5). A significant correction in molar and canine relation was obtained along with significant reduction in over jet and overbite (Figure 6). Figures 7 and 8 show comparison of extra-oral and intra-oral changes brought about by twin block.

Figure 4: Twin Block Appliance

Figure 5: Post-Treatment Extra Oral Photos
Figure 6: Post-Treatment Intra Oral Photos

Figure 7: Pre and Post Treatment Extra Oral Changes
3. DISCUSSION

Class II malocclusion might have any number of a combination of the skeletal and dental component. Hence, identifying and understanding the etiology and expression of Class II malocclusion and identifying differential diagnosis is helpful for its correction and to select treatment planning whether functional, orthodontic or surgical\(^{[4]}\). Clark’s twin block is a functional appliance, which effectively modifies occlusal inclined plane which induces favorably directed occlusal force by causing a Mandibular displacement \(^{[5,6]}\). It allows masticatory function. The patient can wear the appliance full time with little discomfort. Other advantages include esthetic, easy to repair, and robust. It is suitable for mixed dentition as well as deciduous dentition \(^{[7]}\).

There were several studies where they have documented the ability of twin block appliance to produce significant skeletal as well as dentoalveolar changes which in combination correct Class II malocclusion \(^{[8,9,10]}\).

Here, comparison of pre-treatment and post-treatment lateral cephalogram (Figure 9) showed SNA remained unchanged, and SNB increased by 3°. ANB angle reduced up to 3°. The inclination of maxillary remains same and Mandibular incisors was proclaimed by 2°. Length of the mandible is increased by 5 mm (Table 1).
Table 1: Comparison of Pre- and Post-Treatment Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
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<tbody>
<tr>
<td>SNA</td>
<td>82°</td>
<td>82°</td>
</tr>
<tr>
<td>SNB</td>
<td>76°</td>
<td>79°</td>
</tr>
<tr>
<td>ANB</td>
<td>6°</td>
<td>3°</td>
</tr>
<tr>
<td>SN-GOGN</td>
<td>28°</td>
<td>28°</td>
</tr>
<tr>
<td>Maxillary length</td>
<td>78 mm</td>
<td>79 mm</td>
</tr>
<tr>
<td>Mandibular length</td>
<td>94 mm</td>
<td>99 mm</td>
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<tr>
<td>Nasolabial angle</td>
<td>79°</td>
<td>81°</td>
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<tr>
<td>IMPA</td>
<td>90°</td>
<td>92°</td>
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4. CONCLUSION

Effect of twin block depends upon patient’s compliance and case selection. Use of this appliance during growing phase with good patient co-operation produce the skeletal effect, and some dent alveolar effect is also there.

5. CLINICAL SIGNIFICANCE

During permanent dentition phase and growing age and good patient’s cooperation, twin block is as much effective as in mixed dentition phase.

6. ACKNOWLEDGEMENT

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7. REFERENCES