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Correction of Class II Malocclusion using Twin Block Appliance: A Case Series

Dr. Savitha Sathyaprasad[1], Dr. Amogha K B[2], Dr. Prapti Raval[3]

[1]Senior Professor, HOD, Department of Pedodontics & Preventive Dentistry, KVG Dental College Hospital

[2]Post graduate Student, Department of Pedodontics & Preventive Dentistry, KVG Dental College Hospital

[3]Post Graduate Student, Department of Pedodontics & Preventive Dentistry, KVG Dental College Hospital

Abstract: ***Introduction: Class II malocclusions is one of the most common problems around the globe affecting around one third of the patients who seek orthodontic correction. Twin block appliance from its inception and evolution itself has been widely accepted as a promising appliance compared to earlier bulky monoblock appliance. Twin block appliance is very effective in growing patients to positively modify the dentoskeletal relation. In this case series we are discussing three cases treated with twin block appliance where patient's main concern was aesthetics. Patients had retrognathic mandible with convex profile. Patients had class II malocclusion with hyperactive mentalis all of which was treated with twin block therapy. The treatment proved to be effective in growing patients. Conclusion: the twin block therapy is effective myofunctional therapy proved to be effective in growing patients wherein it regulates the growth of mandibular jaw.***

Keywords: twinblock, class II malocclusion, myofunctional therapy.

1. Introduction

A significant percent of disharmony in growth of maxilla and mandible is evident in growing children with distal step. Different rates of mandibular growth at puberty, as well as the peak in mandibular growth velocity, can be judiously utilised on the basis of several methods utilised for bringing harmony in jaws with cranial base through the assessment of skeletal maturity indexes.1

Class II functional appliances are indicated in the correction of mandibular deficiencies as they allow mandibular postural changes by holding the mandible forward and/or downward (1). The muscles and soft tissues are stretched with the generated pressure transmitted to the skeletal and dental structures potentially resulting in skeletal growth modification and tooth movement (1). Both fixed and removable Class II functional appliances are used to improve Class II malocclusions. Since the success with removable appliances largely depends on patient's compliance, using a more tolerable appliance can increase the chances of a favourable outcome

In 1982, Clark described the twin block appliance. In United Kingdom, it was one of the popular functional appliances. Many evidences suggest that it may be considered as one of the most successful appliances for the treatment of skeletal Class II malocclusions. Bite registration is mostly taken with the incisors with edge - to - edge relation. Many authors have suggested that greater orthopedic effect can be achieved by advancing bite gradually. It produces less incisor tilting in cases such as Class II division I.2, [3]

Here is the case series of 3 patients of different ages treated with twin bock therapy

2. Treatment Objectives

- To achieve the normal overjet and overbite
- To enhance mandibular growth
- To provide harmonious maxilla - mandible growth in relation to the cranial base

Case 1:

A 14 - year - old male patient accompanying his mother reported to the Department of Pediatrics and Preventive Dentistry, KVG Dental college and Hospital, Sullia with the chief complaint of forwardly placed upper front teeth since 5 years.

Intraoral and extraoral examination revealed dolicocephalic head and leptoprosopic face with incompetent lips and convex profile. Molar relation was End - on on right side and Class II on left side. The nasolabial angle was 95° with a deep mentolabial sulcus. He had a positive VTO on advancement of mandible

Intraoral examination

The cervical maturity index score showed stage 4 that is Deceleration with 10 to 25% of growth remaining.

Parameter	Actual	Obtained
SNA	82°	77°
SNB	80°	70°
ANB	2°	7°
Occlusal Angle	14°	17°
Mandibular plane angle	32°	38.5°
I to Pt A linear	4mm	7mm
I to Pt A angle	22°	34°
I to Pt B linear	4mm	0mm
I to Pt B angle	25°	10°
Interincisal angle	131°	51°


Lateral Profile


VTO


Anterior bite


Twin block appliance


Appliance delivered

A twin block appliance was planned for the correction along with lip bumper and active labial bow. Full time wear of twin block was advised till the correction of distal occlusion. Anterior inclined plane is given until complete buccal segment interdigitation occurs. The treatment was planned for duration of 18 months. As patient is vertical grower posterior bite block remained unreduced and intact throughout the treatment

Results: By the end of the twin block therapy there was a significant increase in SNA, SNB angles and reduced ANB angle improving the overall profile of the patient. We could achieve an obtuse nasolabial angle.

Case 2:

A 12 - year - old female patient accompanying her mother reported to Department of Pediatrics and Preventive Dentistry, KVG Dental College and Hospital, Sullia with the chief complaint of forwardly placed upper front teeth since 4 to 5 years no contributing medical history was reported by the mother.

Intraoral and extraoral examination revealed mesocephalic head and mesoprosopic face with incompetent lips and hypertonic muscles. Class II molar relation was noted on both the sides. Nasolabial angle was 89°. The patient showed positive VTO on advancement of mandible

Parameter	Actual	Obtained
SNA	82°	82°
SNB	80°	74°
ANB	2°	8°
Occlusal Angle	14°	19°
Mandibular plane angle	32°	34°
I to Pt A linear	4mm	10mm
I to Pt A angle	22°	44°
I to Pt B linear	4mm	7mm
I to Pt B angle	25°	28°
Interincisal angle	131°	101°

Appliance delivered

The cervical maturity index showed stage 2 that is acceleration with 65 to 85% of growth remaining. A twin block appliance therapy along with lip bumper and active labial bow was planned. Full time wear of twin block was advised till the correction of distal occlusion. Anterior inclined plane is given until complete buccal segment interdigitation occurs. The treatment was planned for duration of 18 months. A 5 month follow up was done and the U loops of the labial bow were compressed although the bite blocks remained untrimmed.

Results: At the end of 18months treatment an obtuse nasolabial angle was achieved with a SNB angle of 80^0. Anterior proclination was reduced with class I molar relation.

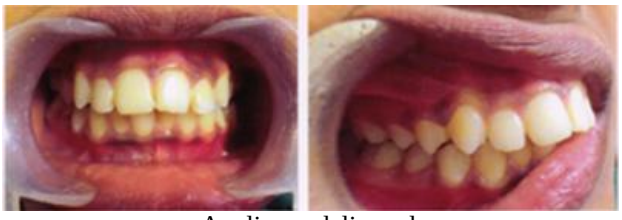
Case 3:

A 9 - year - old female patient accompanied with mother reported to the Department of Paediatric and Preventive Dentistry with the chief complaint of forwardly placed tooth since 2 years.

Intraoral and extraoral examination revealed mesocephalic head and mesoprosopic face with incompetent lips and hypertonic muscles. Class II molar relation was noted on both the sides. With orthognathic maxilla retrognathic mandible and hyperactive mentalis action. The patient showed positive VTO on advancement of mandible

Parameter	Actual	Obtained
SNA	82˚	80˚
SNB	80˚	74˚
ANB	2˚	6˚
Occlusal Angle	14˚	21˚
Mandibular plane angle	32˚	29˚
I to Pt A linear	4mm	8mm
I to Pt A angle	22˚	38˚
I to Pt B linear	4mm	5mm
I to Pt B angle	25˚	26˚
Interincisal angle	131˚	109˚

Twin block appliance



Appliance delivered

Post operative

The cervical maturity index showed stage 2 that is acceleration with 65 to 85% of growth remaining. A twin block appliance therapy along with lip bumper and active labial bow was planned. Full time wear of twin block was advised till the correction of distal occlusion. Anterior inclined plane is given until complete buccal segment interdigitation occurs. The treatment was planned for duration of 18 months. Bite blocks are trimmed distoocclusally about 2mm

Result: At the end of the treatment proclination of upper incisor was reduced with an increased SNA, SNB angle and mandibular plane angle which resulted in desired profile or the patient.

3. Discussion

Clark's Twin block is a functional appliance which effectively modifies the occlusal inclined plane to induce favourably directed occlusal forces by causing a functional mandibular displacement. It is aesthetic, allows masticatory function andhas the advantage of full - time wear. Several studies have documented the ability of the twin block to induce significant skeletal as well as dentoalveolar changes, which, in combination, bring about correction of the Class II relationship. The earlier approach to Class II correction involved two phases of therapy—a functional appliance phase in the early mixed dentition followed by an interim period of no active treatment for around 2 to 3 years while the permanent teeth erupted. Fixed appliances were placed once all premolars had erupted.

Class II malocclusion might have any number of 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. Twin block functional appliance has several well - established advantages including the fact that it is well tolerated by the patients and it can be used in mixed and permanent dentition. There are potential disadvantages such as proclination of lower incisors and development of posterior open bite. in this case series, treatment objectives were achieved largely due to good patient compliance. The patients complained of forwardly placed and irregular upper and lower front teeth and backwardly placed lower jaw. The selection of appliance is dependent on several factors which can be categorised in patient factors such as age and compliance, clinical factors such as preference or familiarity.

The myofunctional therapy resulted in an improvement in the patient's profile, which is largely attributed to the favourable growth and partly to the functional appliance. It has been proved in the literature that functional appliances do not produce long - term skeletal changes and most of their effects are dentoalveloar. There was no evidence of a restriction in maxillary growth. Successful results were obtained after the myofunctional therapy within 12 months of time. The overall treatment time was 24 months, i. e., 12 months of functional appliance wear and 12 months of fixed appliance treatment.

Twin - block functional appliance has several advantages including the fact that it is well accepted by the patient,

strong, repaired easily and suitable for mixed dentition period and permanent teeth. Size of this appliance is easy to use by the patient so that speech interference could be minimized. Treatment purposes can be achieved due to the patient's cooperation.

4. Conclusion

Functional appliance therapy is an effective way of treating skeletal Class II malocclusion due to mandibular retrusion via growth modification. The effect of twin block functional appliances is mostly dentoalveloar with small skeletal component. However, there are a number of situations where functional appliances can be successfully used to correct Class II malocclusion.

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