



TWIN BLOCK WITH UPPER LIP PADS FOR CORRECTION OF SKELETAL CLASS II MALOCCLUSION WITH MID FACE DEFICIENCY- RAJMOHAN'S MODIFICATION

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ABSTRACT

The correction of class II division 1 continues to present a challenge to clinicians practicing Pediatric and Orthodontic dentistry. The role played by functional appliances in the correction of skeletal pattern, during the treatment of class II division 1 malocclusion has been still controversial despite their early introduction in the century. In this article we present two cases where we used twin block for correction of mandibular retrognathism with incorporation of upper lip pads as a modification for correction of mid face deficiency. Hence lip pads can be incorporated to twin block as a modification and can be one of the newer treatment modalities for the correction of mandibular retrognathism with mid face deficiency.

KEYWORDS: Twin block, lip pads, skeletal mandibular retrognathism.

INTRODUCTION

The correction of class II division 1 continues to present a challenge to clinicians practicing Pediatric and Orthodontic dentistry. The role played by functional appliances in the correction of skeletal pattern, during the treatment of class II division 1 malocclusion has been still controversial despite their early introduction in the century. The introduction of twin block appliance to the orthodontic armamentarium in the year 1977 by Dr. William Clark, has been a significant improvement in treatment of non compliant Class II- patients. 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 monobloc appliances. Beside the effect of the functional appliances on the dentoalveolar process, many clinicians believed that the anterior displacement of the mandible with the consequent stretch in muscles also produce a stimulation of condylar growth. Such growth results in permanent forward positioning of the mandible (Calvert, 2010). Recently, anterior relocation of the glenoid fosse has been proposed as another possible treatment result of functional appliances.^[1-3] Illing et al^[3] showed the appliance to be advantageous in terms of its rapidity of

correction, compared with Bass and bionator appliances. Lund and Sandler^[1] investigated the Twin-block appliance in a prospective controlled study and like many other authors, concluded that Class II correction was achieved primarily by dentoalveolar changes.

Advantages of Twin Block are that Patients can wear Twin Blocks full time and can eat comfortably with the appliances in place. There is less interference with normal function because the mandible can move freely in anterior and lateral excursion without being restricted by a bulky one-piece appliance. Twin Blocks may be fixed to the teeth temporarily or permanently to guarantee patient compliance. Removable Twin Blocks can be fixed in the mouth for the first week or 10 days of treatment to ensure that the patient adapts fully to wearing them 24 hours per day. Patients can learn to speak normally with Twin Blocks. In our case we used twin block for correction of mandibular retrognathism with incorporation of upper lip pads as a modification for correction of mid face deficiency. However when patients with retrognathic mandible have associated mid face deficiency then we need to combine the twin block with reverse pull head gear or frankel appliances. But

these appliances have the major disadvantages of patient compliance. Hence a modified twin block was attempted with lip pads for such cases of midface deficiency.

MATERIALS AND METHODS Case no.1

A 11 year old child reported to the department of Pedodontics and Preventive Dentistry, AB Shetty Memorial Institute of Dental Sciences with the complaint of forwardly placed upper front teeth. On extra oral examination, the child had a dolicocephalic head type with a leptoprosopic facial pattern. The facial profile was convex with posterior divergence and no facial asymmetry. On intra oral examination, Angle's class II molar relation was observed. The lateral cephalogram was advised to assess the skeletal relation of the patient and the results indicated that there was a mandibular retrognathism with mid face deficiency. (fig.1).

Case no.2

The parents of 10 year old child reported to the department of Pedodontics and Preventive dentistry, AB Shetty Memorial Institute of Dental Sciences with the complaint of irregular teeth. On extra oral examination, the child had a dolicocephalic head type with a leptoprosopic facial pattern. The facial profile was convex with posterior divergence and no facial asymmetry. On intra oral examination, Angle's class II molar relation was observed. The lateral cephalogram was advised to assess the skeletal relation of the patient and the results indicated that there was a mandibular retrognathism with mid face deficiency (fig.2).

APPLIANCE DESIGN

Twin block appliance was planned for both of the cases. It consisted of upper and lower acrylic bite block

Case.no.1 (figure1)

(EXTRA ORAL)

inclined at 70 degree when engaged in full closure. The lip pads were supported by labial wires arising from the

acrylic plate and was 7 mm below the gingival margin. Lip pads were constructed using cold cure acrylic. The bottom of the pad was 12 to 14 mm below the gingival margin at the level of the lateral incisor. All the margins were rounded and polished.

The treatment plan for both these cases were primarily aimed at correcting mandibular retrognathism by using the growth potential of the child. The facial profile showed slight midface deficiency although the cephalometric values were in the normal range. Twin block was planned as it's the skeletal mandibular deficiency which had led to class II malocclusion. The appliance was modified with upper lip pads for the correction of midface deficiency. Both the patients were made to wear the appliance for 12 hours a day and then followed up at regular intervals for 1 year.

RESULTS

Case no 1-The results showed that the mandibular deficiency or SNB improved from 79 to 81. There was an increase in SNA value from 86 to 89 which may be due to the presence of lip pads. The overjet reduced from 8mm to 2mm hence showing reduction in maxillary proclination. Inter incisal angle advanced from 74 to 88. Anterior overjet and skeletal mandibular retrognathism was corrected. The mid face also improved hence supporting the action of upper lip pads. The mandibular advancement was observed. (table 1).

Case no. 2

The results showed that the mandibular deficiency or SNB improved from 74 to 80. There was an increase in SNA value from 77 to 83. Inter incisal angle also advanced from 109 to 115. The mandibular advancement was observed. (table 2).

The treatment for both was then followed by fixed orthodontics.



(INTRAORAL)



TWIN BLOCK WITH MODIFICATIONS OF LIP PADS

Lateral cephalogram

Pre-operative

Post-operative



Lateral cephalometric values (Table 1)

ANTERIO-POSTERIOR RELATIONSHIP	NORMAL VALUES	Pre treatment	Post treatment
MAXILLA- SNA	82°	86°	89°
MANDIBLE- SNBSNB {Steiner's}	80°	79°	81°
ANBNB {Steiner's}	2°	7°	3°
Mandibular plane angle {Steiner's}	32°	28°	24°
Y-axis {Down's}	53°-66°	64°	62°
Jarabak's Ratio S-Go/N-Me	58°-64%	66°	72°
Occlusal plane angle		15°	22°

MAXILLARY INCISORS				
Upper incisor to NA(deg/mm){steiners}		22°/4mm	41°	31°
MANDIBULAR INCISORS				
Lower incisor to NB deg/mm){ Steiners}		25°/4mm	24°	30°
Inter-incisal angle {Downs}		130°-150°	74°	88°

Case no. 2 (Fig 2)

**EXTRAORAL****INTRAORAL****LATERAL CEPH**

Case no.2- Lateral Cephalometric Values (table 2)

ANTERIO-POSTERIOR RELATIONSHIP	NORMAL VALUES	Pre treatment	post treatment
MAXILLA			
SNA {Steiner's}	82°	77°	83°
MANDIBLE			
SNB {Steiner's}	80°	74°	80°
ANB {Steiner's}	2°	3°	3°
MANDIBULAR PLANE ANGLE		40°	32°
OCCLUSAL PLANE ANGLE		16°	19°
Y-axis {Down's}	53°-66°	71°	67°

MAXILLARY INCISORS	Normal	Pre	Post
	values	treatment	treatment
1 Upper incisor to NA (deg/mm)	22°/4mm	45 ⁰ /6mm	24 ⁰ /4mm
MANDIBULAR INCISORS			
2 Lower incisor to NB (deg/mm)	25°/4mm	22 ⁰ /4mm	21 ⁰ /3mm
3. INTERINCISAL ANGLE		109 ⁰	115 ⁰

DISCUSSION

Results showed that there was a significant increase in SNB angle as seen in other studies.^[2,5] This was attributed to the forward positioning of the mandible by the twin block appliance which works on the principle of pterygoid response.^[6] The mid face deficiency improved which may be due to the function of upper lip pads which worked by stimulating periosteal bone deposition and bringing about lip seal as seen in other studies.^[4] They were tear drop in shape which allows the proper positioning of the pads in labial sulcus. (Mc Namara 1982). This shape also allows for a more comfortable fit for the patient, by allowing the pad to tuck into the undercut below the incisors. This allows more comfort for the patient by allowing the pad to tuck into the alveolar undercut below the incisors. This concept was employed from the Frankel regulator (FR III) appliance where there is upper lip pads which aided in periosteal bone deposition (Frankel, 1969). The lower labial pads as seen in Frankel appliances allows proper positioning of the pads in the labial sulcus and prevents gingival stripping when the appliance moves and the jaw opens and closes. Both the patients were comfortable as the lip pads tucked to the alveolar undercut below the incisors. Similar concept is used in the frankel regulator type III where the upper lip pads aids in periosteal bone deposition (frankel, 1969). The upper labial pads as seen in FR III will inhibit the function of the upper lip, thereby allowing the downward and forward growth of the maxilla to occur unimpeded. The patients compliance was good in both the cases as against other functional appliances and orthopaedic appliance where the children refuse to wear them.

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