Case Report

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REVERSE TWIN BLOCK – A VERSATILE FUNCTIONAL APPLIANCE TO INTERCEPT PSEUDO CLASS III MALOCCLUSION IN CHILDREN

Kanika Gupta [1], Ashish Justa[2]
1.MDS, Department of Pedodontics and Preventive Dentistry, Himachal Dental College, Sunder Nagar
2.MDS, Department of Pedodontics and Preventive Dentistry, Himachal Dental College, Sunder Nagar

ABSTRACT:

Early management of prognathic mandible by simply directing the growth of the jaws in a more favourable manner has shown encouraging outcomes. Although growth modification techniques sound a little complex but a simple removable appliance with inclined planes and patient's compliance is all that we need to acquire an esthetically pleasing facial profile. In the present report, the developing pseudo class III malocclusion in 2 children has been successfully intercepted using RTB appliance. Appreciable differences and marked improvements in facial appearance not only decreased the risk of future deterioration of skeletal mandibular prominence, indeed stimulates normal orofacial and psychosocial development of the child.

Keywords: Pseudo class III, growth modification, reverse twin block

INTRODUCTION:

The development of pseudo class III malocclusion in the mixed dentition is one of the frequently encountered dilemma that the pediatric dentist or the general practioner comes across, as it tends to worsen with age if not treated well on time.[1] Moyer's suggested pseudo class III malocclusion as a positional malrelationship with an acquired neuromuscular reflex.[2] This malocclusion is associated with anterior crossbite as a result of mandibular displacement and is a combination of skeletal (maxillary skeletal retrusion, mandibular skeletal protrusion, or a combination) and dentoalveolar deformities.[1,2] Forward displacement of the mandible usually occurs due to premature contact between the maxillary and mandibular incisors which is known as postural or habitual class III malocclusion. Other etiologic factors might include trauma to primary incisors (resulting in lingual displacement of the permanent tooth buds), presence of supernumerary anterior teeth, crowding, over retained teeth, and odontomas.[3]

The Twin Block appliance is the choice of treatment for Class II malocclusions in growing children. However, Clark has also described a modified version of it that can be accepted in Class III malocclusions. Clark states that reverse angulation of blocks harnesses occlusal forces to advance the maxilla and maxillary dentition while using the mandible as anchorage and restricting its development.[4] Although numerous appliances have been advocated for correction of anterior segment crossbite such as Delaire style face mask or reverse

*Corresponding Author Address: Dr. Kanika Gupta. E-mail: kanikagpt09@gmail.com

headgear for maxillary deficiency, Chin-cup type headgear for mandibular prognathism or Function Regulator III (FR III).[5] But, the reverse twin block (RTB appliance) is amongst the one that can be easily fabricated, well tolerated, viable and effective treatment modality for early management of developing class III malocclusion.[5,6]

CASE DETAIL:

A 10 years old boy presented with the chief complaint of presence of an extra sharp tooth in the region located just behind the front teeth. The family history was not suggestive of any genetic predisposition. Medical and dental history was non- relevant. On extraoral examination, a concave profile was noticed with an appearance of maxillary growth restriction. [Figure 1].

Intraoral examination revealed a conical supernumerary tooth present palatal to upper incisors and mixed dentition stage with erupting lower permanent canines and premolars. Bilateral class I molar relation with reverse overjet of 2mm and overbite of 2mm was noticed along with anterior mandibular displacement on closure [Figure 2]. Lateral cephalometric analysis revealed a class III skeletal pattern (orthognathic maxilla and mild mandibular prognathism) with proclined upper incisors and increased vertical growth [Figure 1]. The patient was diagnosed to have pseudo Class III Malocclusion

The treatment plan included the extraction of conical supernumerary tooth followed by the correction of anterior crossbite by restricting mandibular growth. For this purpose, RTB was delivered to the patient for full time wear.

RTB appliance design

Prior to the fabrication, bite was registered in the position of maximum possible retrusion of mandible with interincisal clearance of 2 mm and vertical clearance of 5 mm in the buccal segments.

Retentive wire components with active reverse labial bow in lower arch and reverse occlusal inclined planes cut at a 70° angle were constructed and fitted in the patient's mouth. Necessary instructions were given and the patient was made to practice wearing and removing the appliance for cleaning. Routine adjustments were made on follow- up visits.

With RTB, edge to edge incisors relationship was achieved after 2 months and anterior crossbite was corrected within 5 months [Figure 3], which was maintained at 1 year follow- up. Post treatment and follow up skeletal and dental changes are mentioned in Table 1 [Figure 4 and 5]. The patient and his parents were glad to see the desired and promising changes in profile and appearance of teeth. The patient continued with the same appliance at night time to retain the achieved correction.

Table 1: Comparison of Pretreatment and Post treatment cephalogram parameters

Cephalometric parameters	Pre-treatment	Post treatment	Normal values
SNA	**87**	**88**	82
SNB	86	86	80
ANB	**1**	**2**	2
FMA	24	24	25
IMPA	102	95	90
FMIA	54	61	65
Y- AXIS	55	55	59
INTERINCISAL ANGLE	118	115	135
UPPER I TO NA	**24**	**29**	22
LOWER I TO NB	**30**	**28**	25
GONIAL ANGLE	119	122	123
ARTICULARE	**145**	**147**	145
SADDLE	120	120	128

DISCUSSION:

A class III malocclusion is not a single diagnostic entity instead a spectrum of clinical manifestations, and cephalometric features that predict differing biologic potential. Most importantly, identification of a specific class III malocclusion in the young child allows both early treatment and correction of the underlying etiology to counter the unfavorable developmental pattern.[7] In this case, presence of supernumerary tooth was interfering with the normal occlusion resulting in the development of pseudo class III, so it was removed prior to the definite treatment.

Once the appliance is delivered, the maxilla starts to advance anteriorly within 4 weeks which is evident with the patient's edge-to-edge bite anteriorly. Addition of acrylic to the inclined planes may be necessary to increase the forces over the maxilla and establish a positive overjet. Kidner *et al*., in their evaluation of the reverse twin block appliance on 14 subjects of <12 years of age, concluded that the changes were preferably dentoalveolar, with the skeletal changes limited to slight downward and backward rotation of the mandible. The average treatment time in their patients was only 6.6 months.[5] No damaging force

is exerted on the condyles because the bite is hinged open with the condyles down and forward in the fossae, and the inclined planes are directed downwards and backwards on the mandibular teeth. The force vector in the mandible passes from the lower molar towards the gonial angle which is the area best able to absorb occlusal forces.[7]

With good motivation and periodic reinforcement, twin blocks are advised to be worn 24 hours per day to take full advantage of all functional forces applied to the dentition. Some authors suggests intervention in deciduous dentition period while others advocate intervention between 8-11 years of age when root is being formed and teeth are in active stage of eruption.[8] This has been shown to be more beneficial to the child because there is improved maxillary orthopaedic correction combined with controlled mandibular growth rather than postponing it to the later childhood growth stages. If left untreated, the class III malocclusion or severe anterior crossbite may deteriorate, with the majority of these patients ultimately requiring orthognathic surgery as adults.[9] The treatment with Reverse twin block was cost effective, versatile and patient friendly. Moreover the desired facial esthetics convinced the parents concern and also applauds the operator's proficiency.

CONCLUSION:

Reverse twin block has been found to be one of the very best appliance in the treatment of pseudo class III malocclusion as it delivers the early treatment outcome if worn as advised.

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FIGURES:

Figure 1: Pre- treatment facial photographs and lateral cephalogram

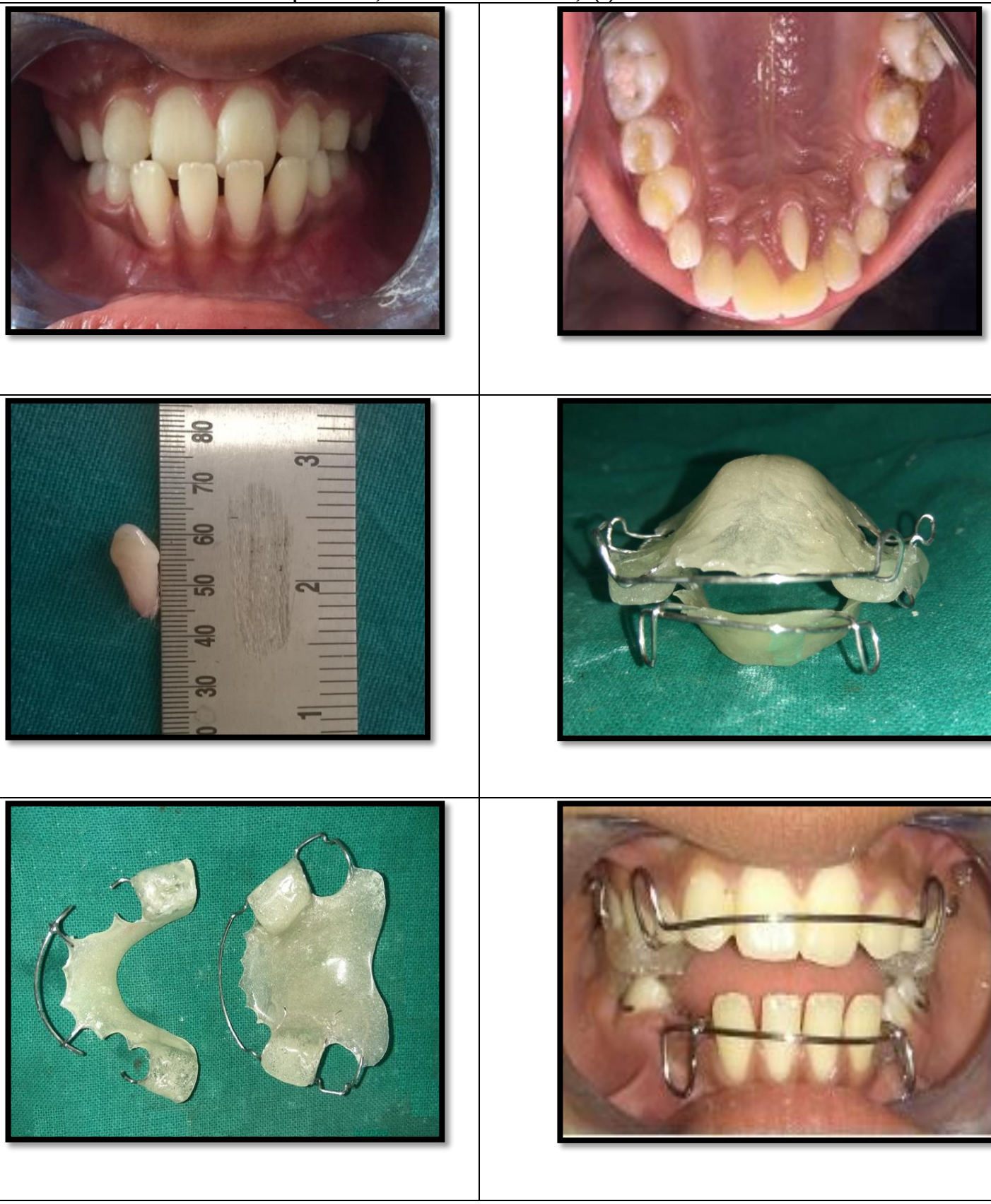

Figure 2: Intraoral photograph showing reverse overjet; extraction of supernumerary tooth and components of RTB

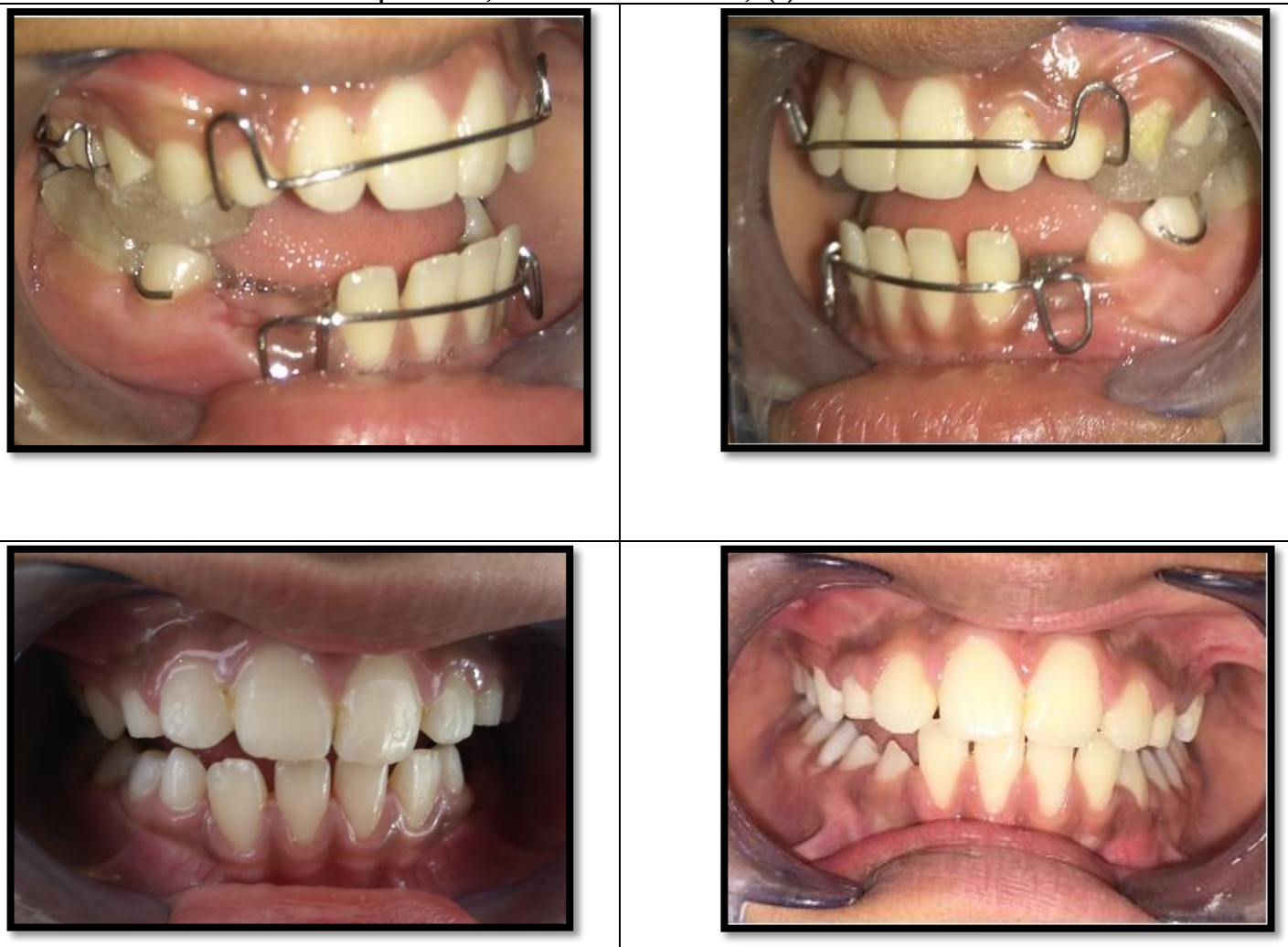

Figure 3: Edge to edge incisors relationship was achieved after 2 months and anterior crossbite was corrected within 5 months

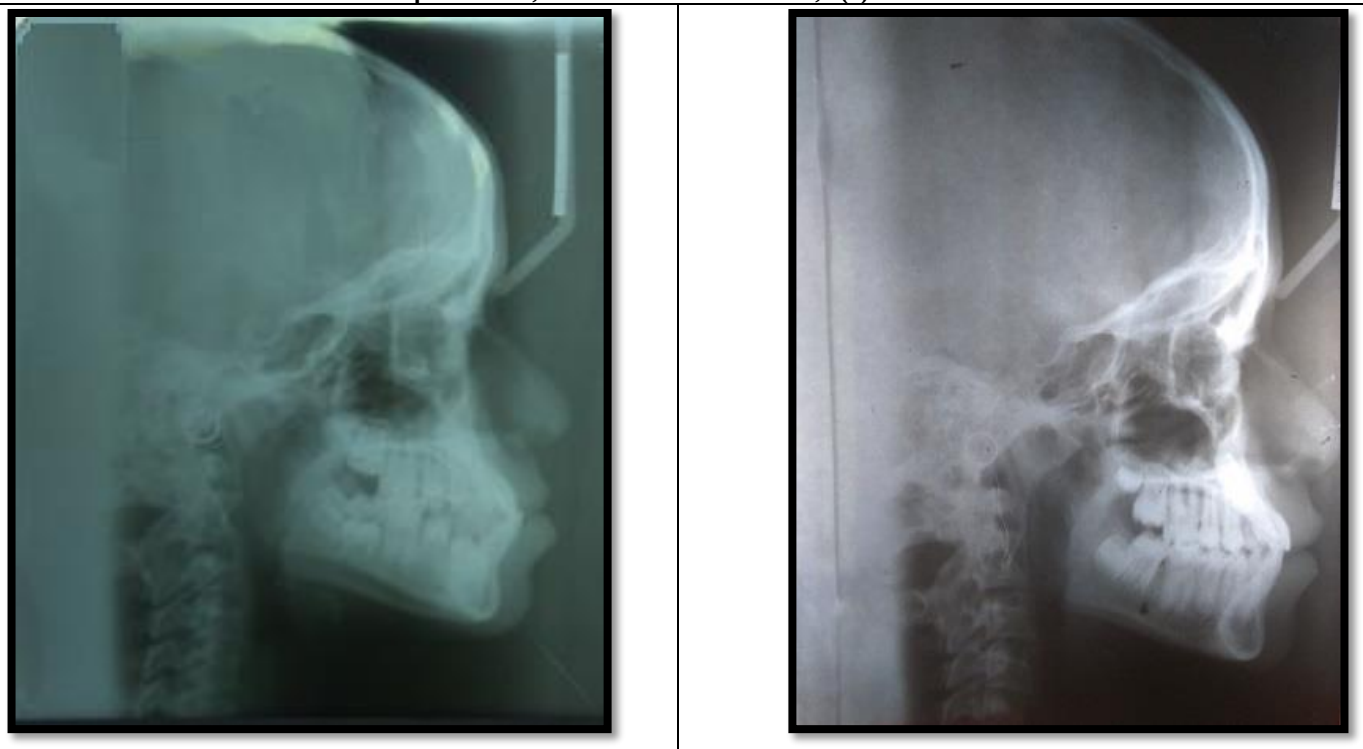

Figure 4: Comparison of pre and post treatment lateral cephalogram

Figure 5: Pre and post treatment facial photographs (Frontal view)