CLASS II CORRECTION USING THE TWIN STAR APPLIANCE: A Case Report

A Case Report

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ABSTRACT

The aim of this study was to see the effect of twin star appliance in growing patient. Functional appliances can be used successfully in growing patient with certain Class II malocclusion. It is dependent on patient's compliance. Even the Twin-Block, which is claimed to be one of the most patient friendly appliances, is not so easily accepted by the growing child. An innovative modification of the Twin-Block called Twin-Star. Compared with the traditionally constructed Twin-Block, The Twin-Star proves to be esthetically superior, with a higher level of comfort and is less bulky and hence easily accepted by the patient. A 14-year 4month old girl was treated with twin star appliance. The design of appliance and treatment results were demonstrated in following case report.

Keyword: Chairside, innovative, invisible, myofunctional appliance, Twin-Block

INTRODUCTION:

The main objective of functional appliance therapy is to encourage or to redirect the growth in a favourable direction. Many functional appliances have been fabricated for the correction of Class II division 1 malocclusion. The major differences in the effects between various orthopaedic appliances are mainly related to the technique of fabrication, construction bites, and hours of wear. The Twin-block appliance was originally developed by Clark1 and is widely used as a functional appliance for the management of Class II malocclusion. Its popularity is attributable to its ability to produce rapid treatment changes and perhaps it is the only myofunctional appliance which has been extensively studied. However, it has certain undesirable effects, such as mandibular incisor proclination2,3 an increase in the vertical facial dimension, which is not acceptable in high-angle patients4, clockwise rotation of the maxillary plane4, limited increase in mandibular growth, which might not be present in the long term5 and moderate but not excellent patient compliance6.

Over the years a need to overcome the adverse effects of the twin block led to the development of a modified version of the appliance, termed the twin star appliance. It has been developed as an attempt to overcome some of these limitations especially dealing with the patients compliance. It has been widely seen that aesthetics and comfort play a major role in increasing the patient compliance, which is of ultimate concern to the orthodontist to achieve optimum results. We orthodontists find young patients reluctant to wear a Twin-Block because of either social or psychological reasons.

An innovative method has been devised in which a Twin-Block can be fabricated chair side in a single sitting with the help of a Biostar unit (Biostar® VI with Scan Technology, Great Lakes Tonawanda, NY) or any other pressure molding unit. This unique Twin-Block, which we have called "Twin-Star," is made using a Biocryl sheet (Clear Splint Biocryl 1 mm round, Great Lakes Tonawanda, NY). It is patient friendly, as it has a perfect fit, is less bulky, has no wire components and above all it can be easily fabricated by the orthodontist himself.7

2. CASE REPORT

A 14-year 4 month old girl came to the Orthodontic department having a chief complaint of forwardly place upper front teeth. On extra-oral 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 average growth pattern (Fig.1). On intra-oral examination, it showed class II 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 proclination. The cephalometric analysis confirmed the diagnosis of division I on skeletal Class II base (Fig.3). Patient has average growth pattern and mandibular retrusion. Evaluation of patient's cervical radiograph and hand wrist radiograph indicated that she was at the peak of a pubertal growth spurt with a considerable

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amount of growth remaining. The patient has positive visual treatment objective in figure 1.

Figure 1: Pre-Treatment Extra Oral Photos

Figure 1. Positive visual treatment objective

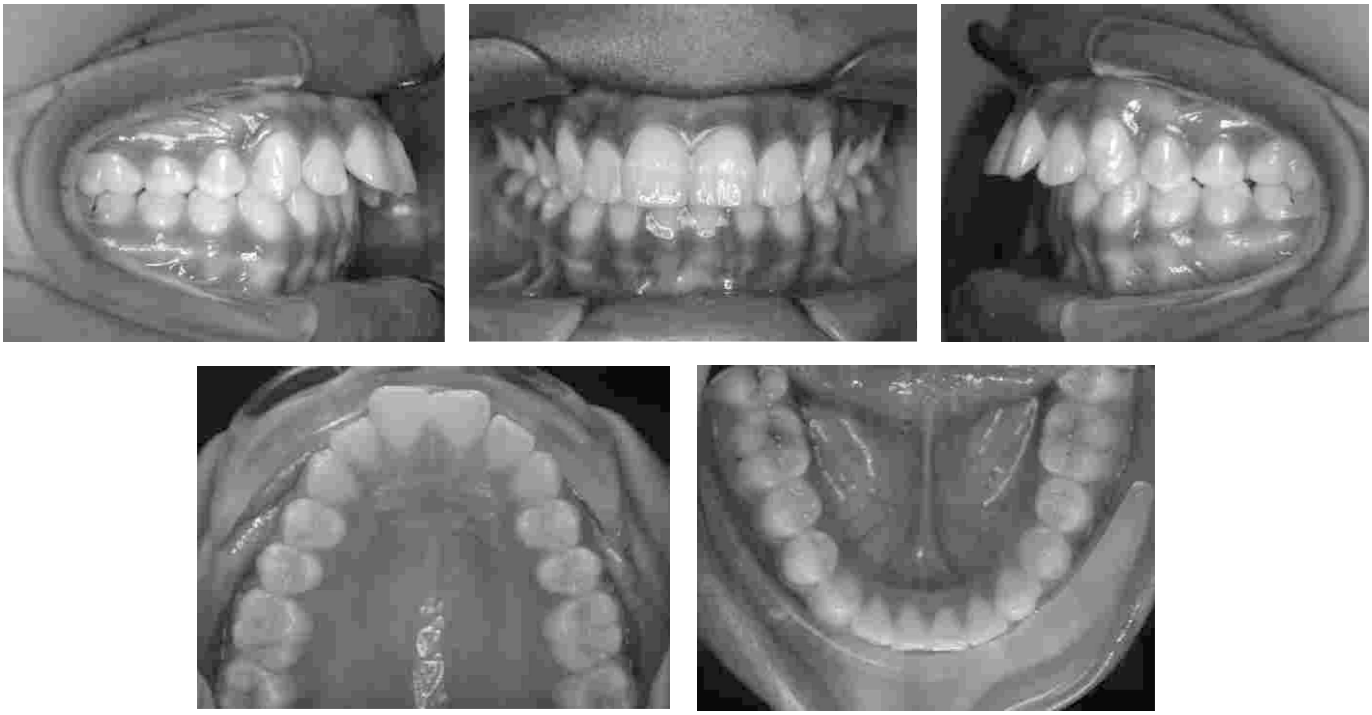

Figure 2: Pre-Treatment Intra Oral Photos

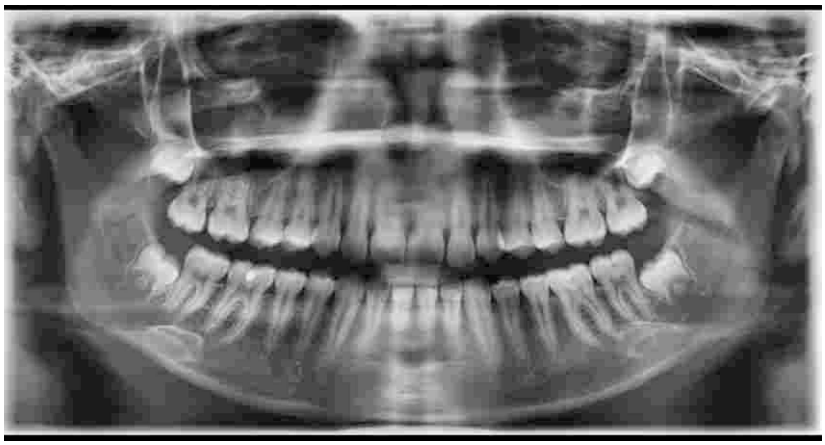

Figure 3: Pre-Treatment Lateral Orthopantograph and Lateral Cephalograph

Figure 3: Pre-Treatment Hand wrist Radiograph

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 5, Hand wrist maturation indicators 8) growth modification was planned using twin star functional appliance and after that the fixed orthodontic appliance plane for final detailing of occlusion.

2.3 Treatment Progress

Twin star was fabricated for the patient (Figure 4). After 12 months period of wear, significant improvement was noted in lip competence and facial profile. (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 star.

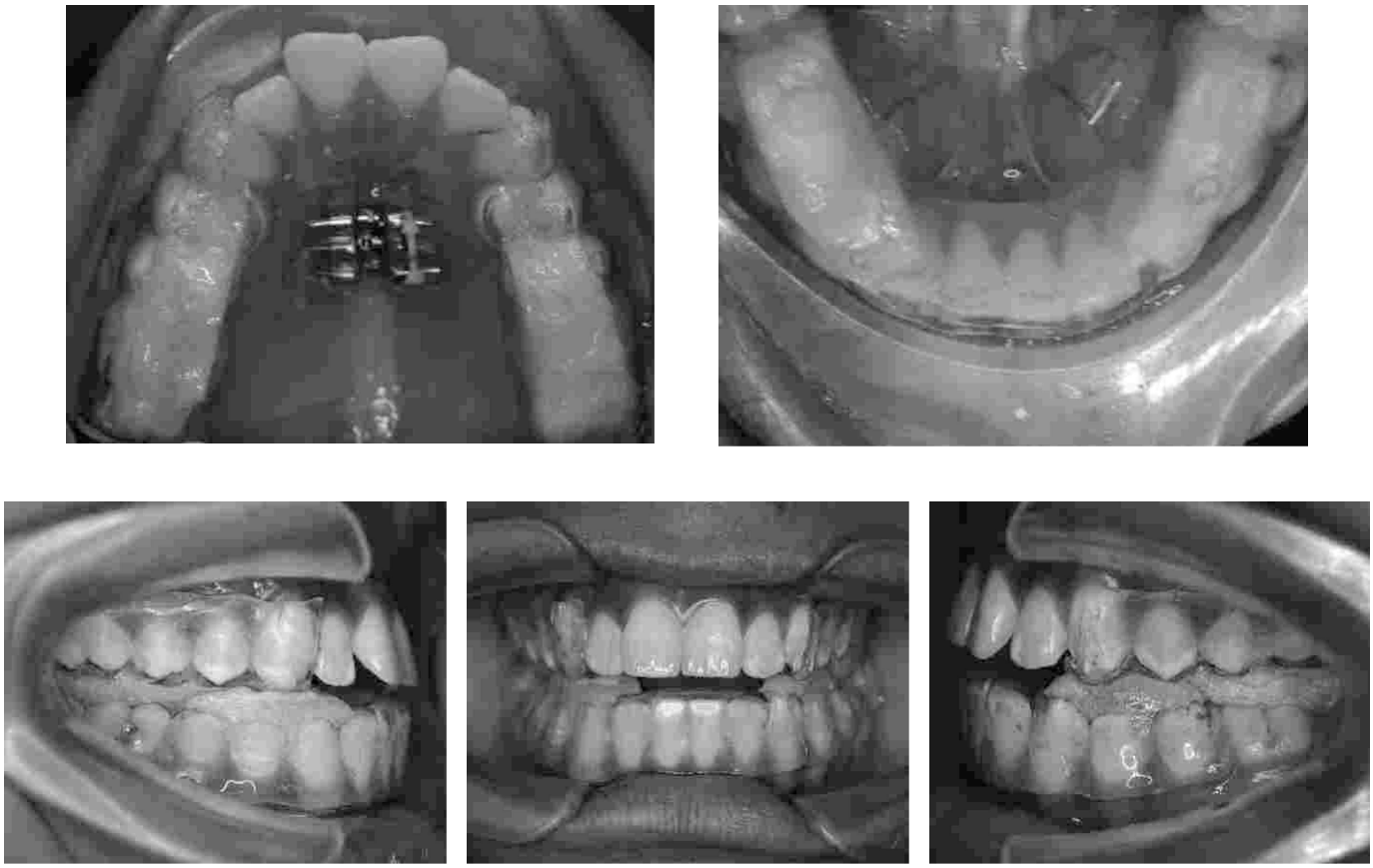

Figure 4: Twin star Appliance in the patient mouth

Figure 5: Post functional Extra Oral Photos

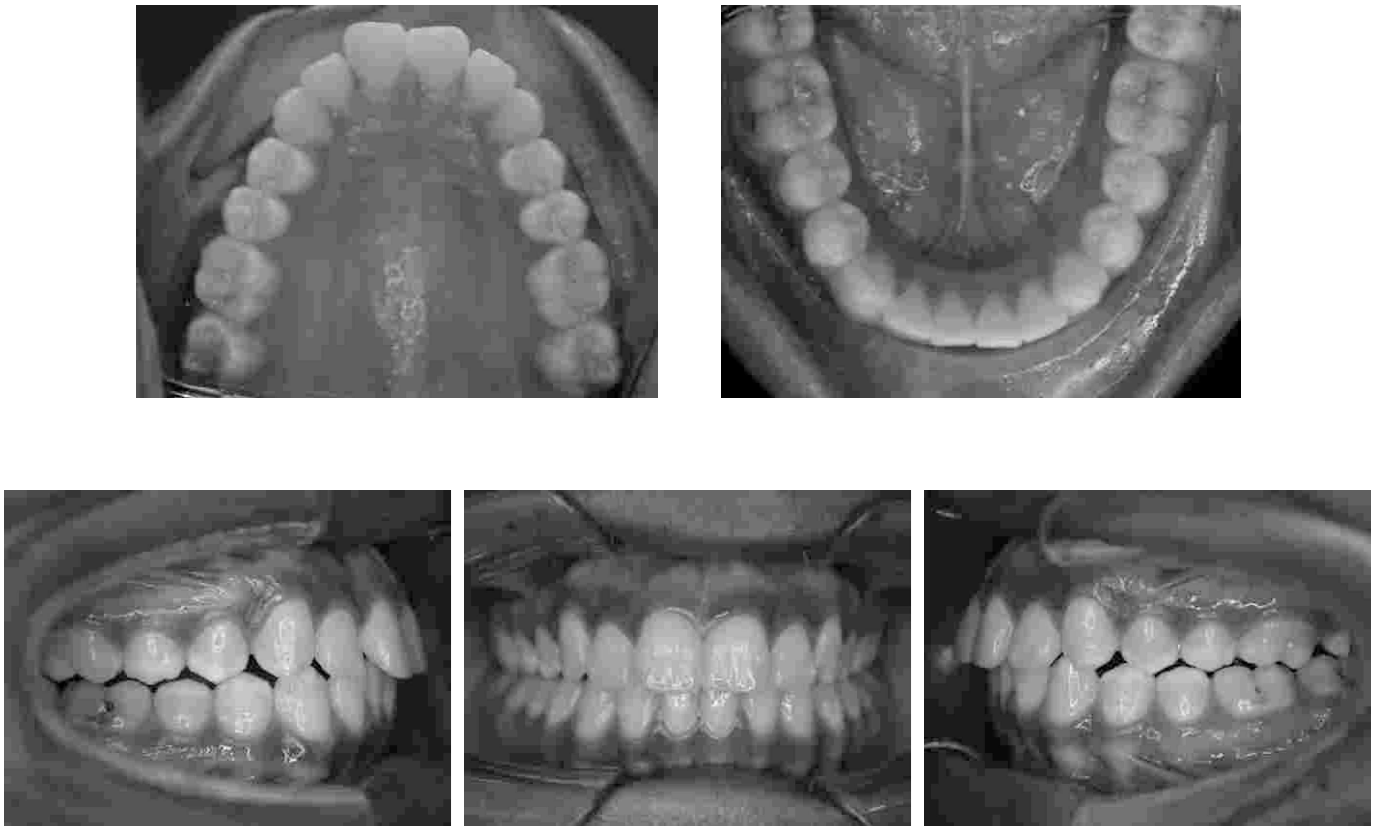

Figure 6: Post functional Intra Oral Photos

Figure 7: Pre and Post functional Extra Oral Changes

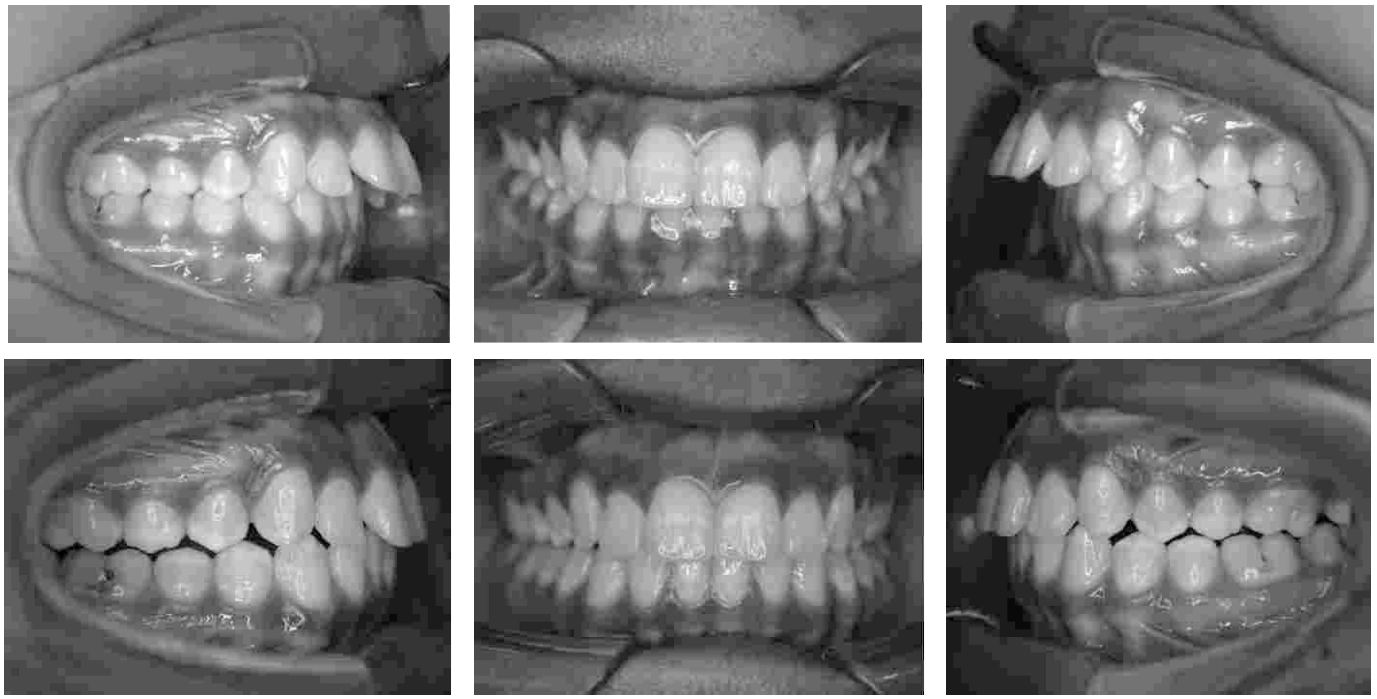

Figure 8: Pre and Post functional Intra Oral Changes

3. DISCUSSION

Class II malocclusion either have a skeletal or dental componet. 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. In this case twin star appliance is use for growth modification in class II malocclusion. The patient can wear the twin star appliance full time with little discomfort. Other advantages include esthetic. It is suitable for mixed dentition as well as deciduous dentition [7].

Here, comparison of pre-treatment and post-functional 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°. (Table 1).

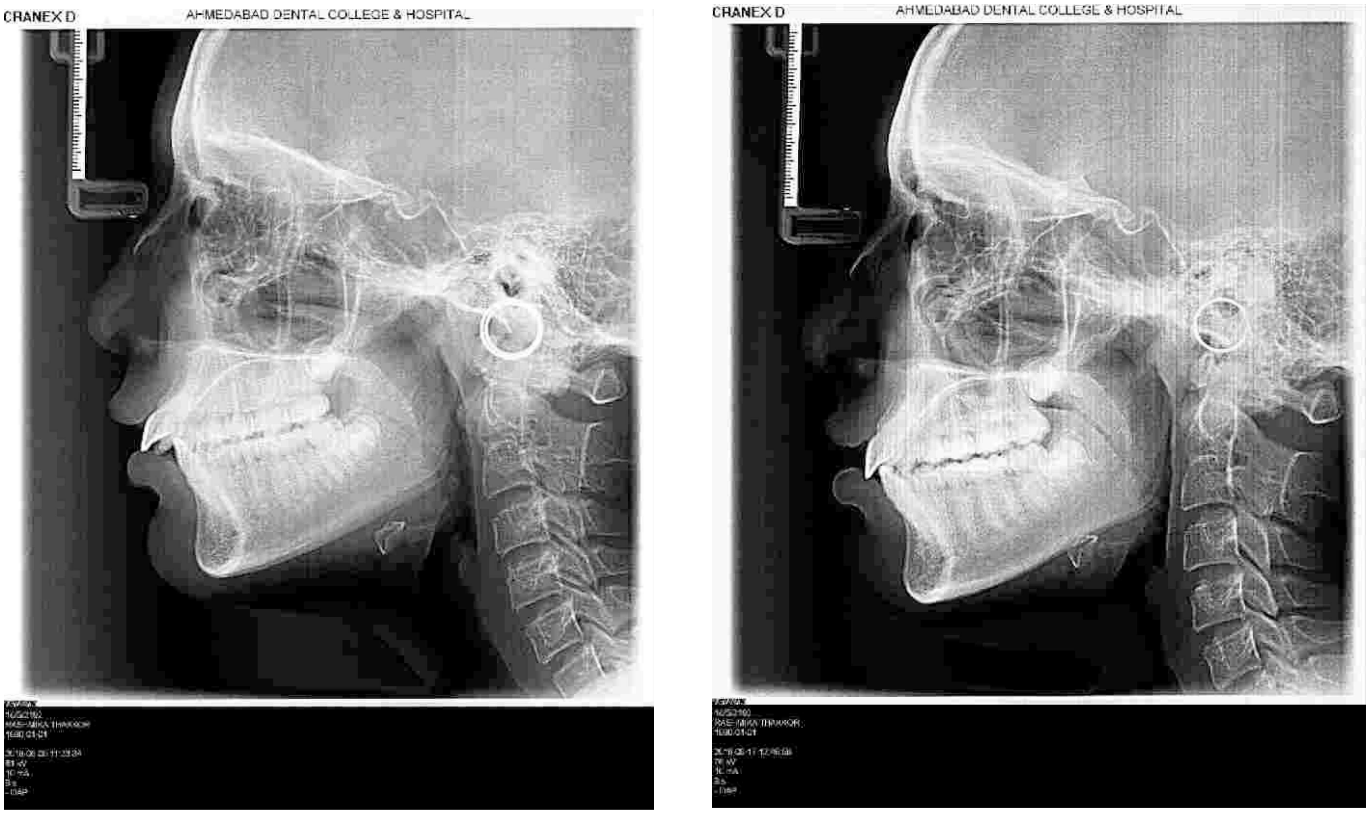

Figure 9: Comparison of Pre-Treatment (a) and Post-Treatment (b) Lateral Cephalogram.

Table 1: Comparison of Pre- and Post Functional Parameters

	PRE TREATMENT	Post functional
SNA	79	79
SNB	76	79
U1-NA	9 (36)	9 (36)
LI-NB	4 (25)	6 (29)
INTERINCISAL ANGLE	116	119
IMPA	93	96
GROWTH PATTERN	average	average
NASOLABIAL ANGLE	94	112
WITTS	AO is 3mm ahead of BO	BO is 1mm ahead of AO

CONCLUSION

An attempt has been made to modify a myofunctional appliance in a way that is beneficial to the patient, as it proves to be more comfortable, esthetic and well-fitting and can be fabricated in a single sitting at the chairside. Use of this appliance during growing phase with good patient co-operation produce significant skeletal or soft tissue changes

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