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Correction of Class II malocclusion with the twin force bite corrector – A case report

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Abstract

A class II intermaxillary dental relationship represents a posterior discrepancy of the lower teeth with regard to the upper teeth. In class II malocclusion the mesiobuccal groove of the lower first molar is posterior to the mesiobuccal cusp of the upper first molar. Various types of appliances are used for treatment of Class II malocclusion cases. Twin force bite corrector is used to correct Class II malocclusion due to retrognathic mandible. This article presents a case of class II malocclusion treatment with TFBC appliance.

Keywords: Class II malocclusion, Functional appliances, Twin force bite corrector, TPA, TFBC

Introduction

One of the most frequently encountered problem in orthodontic practice is Class II malocclusion. Class II malocclusion can occur because of either dental or skeletal discrepancies. If it is due to skeletal discrepancy then mandibular retrognathism is more commonly observed finding. To treat mandibular retrognathism, mandibular advancement needs to be done with various types of functional appliances. It includes fixed inter-arch appliances, such as the Jasper Jumper and Herbst appliance; and fixed intra-arch appliances. These functional appliances are more preferred in growing patients with class II malocclusion due to retrognathic mandible. Among these functional appliances, fixed functional appliances are more preferred over removable functional appliances because of better patient compliance. The Twin force bite corrector is a modern, semi-rigid, fixed functional appliance which can produce gentle and constant force to treat Class II malocclusion due to skeletal discrepancy.

The TFBC consists of two telescopic plungers, containing a NiTi coil spring to provide continuous force. It is fixed to the upper and lower arch wires by hex nuts mesial to the upper first molar and distal to the lower canine. At highest compression, the Twin force bite corrector appliance brings the patient's lower jaw forward into an edge-to-edge bite.

This case report describes treatment of a patient suffering from class II malocclusion due to retrognathic mandible, treated by TFBC appliance.

Case Report

A 18-year-old female patient reported to department of orthodontics and dentofacial orthopaedics, pacific dental college & hospital, udaipur with the chief complaint of forwardly placed upper front teeth and unpleasant smile. The diagnosis made was a Class II malocclusion because of a retrognathic mandible, with a 100% overbite, a 3mm overjet, retroclined maxillary central incisors and a convex profile. Mild crowding was noted in upper and lower arch. After pretreatment cephalometric radiographic analysis, skeletal Class II relationship was confirmed. (ANB - 3°, GoGn - 24°, Gonial angle - 112°, Saddle Angle 125°, Palatal plane – OP - 10°, Mandibular Plane angle- 19°, U1 – Sn - 100°, L1–MP -107°, Nasolabial angle - 90°). (Fig. 1)

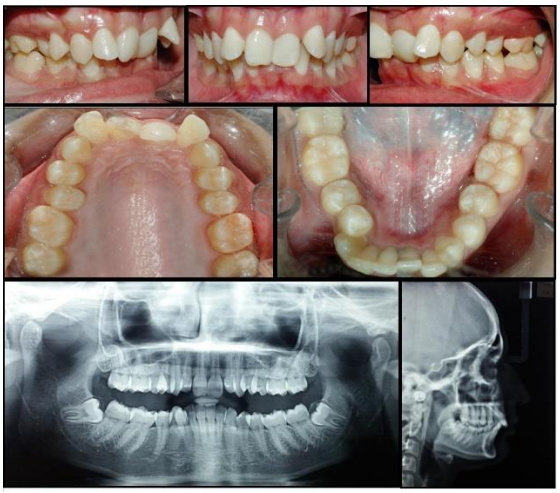

Fig. 1: Pre-treatment records

The treatment objectives were to improve the soft-tissue and skeletofacial relationships by using bio-mechanical forces. Banding of upper first molars were done by using palatal sheaths for TPA placement. TPA was used to counteract the buccal forces on maxillary teeth, produced and applied by TFBC appliance. The upper and lower arches were then bonded with 0.022 MBT pre adjusted edgewise brackets. Labial root torque was given in anterior segment so that minimal proclination occurs.

Light nickel titanium archwires were used to carryout alignment. Wire sizes were increased progressively to .019" □□.025" stainless steel in the upper arch and lower arch.

To minimize the chances of deflection because of the TFBC appliance, stainless steel archwires were used. Both archwires were cinched back to avoid flaring and space opening, and to permit both arches to correct as single dental units.

On delivery of TFBC appliance it was attached to the archwires mesial to the upper first molars and distal to the lower canines, posturing and guiding the lower jaw forward into an protrusivebite. (Fig. 2)

Fig. 2: Pre fixed functional intraoral photographs (Above) and Delivery of TFBA photographs (Below)

On every monthly visit, the TFBC appliance was removed from the lower attachments on left and right sides by loosening the hex nuts and after that centric relation was registered. Desired class I molar relationship was achieved after 90 days. The TFBC and the TPA were removed after getting desired skeletal relationship.

A .017" □□.025" stainless steel archwire was inserted, and the patient was asked to wear class II elastics. The elastics, worn for 90 days, had maintained the desired changes and allowed the posterior occlusion to settle. After finishing, the brackets were removed, and a upper and lower bonded lingual braided-wire retainer were placed. (Fig. 3)

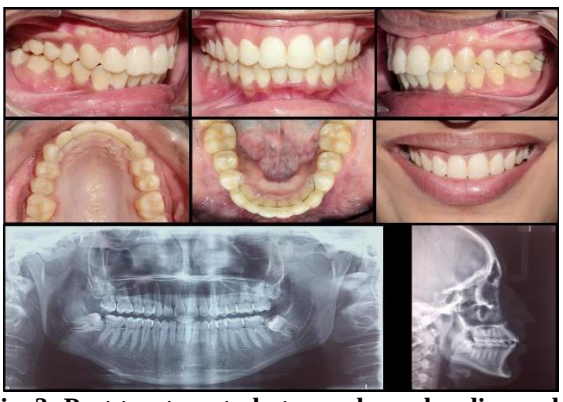

Fig. 3: Post treatment photographs and radiographs

A Class I molar and skeletal relationship was achieved in the patient, with desired overjet and overbite. Patient's chief complaint was fulfilled, and treatment objectives were met. Superimpositions of the lateral cephalogram tracings showed bony changes and the deep bite correction. Also, there was improvement in soft-tissue profile, including a betterment of incisor display at rest.

Discussion

In skeletal class II malocclusion mandibular retrognathism is more commonly observed finding than maxillary prognathism. TFBC appliance is highly indicated for correction of this type of skeletal discrepancies. Campbell et al. was the first to use the TFBC in a prospective longitudinal study.[1] In his study, dento-alveolar and skeletal changes of 22 patients were compared to skeletally age-matched control group. Results revealed decreases in ANB, AB(FH), AB(OP), NAPg, and overjet. Correction of class II malocclusion with semi-rigid fixed functional appliance causes advancement of lower jaw and improves maxilla-mandibular skeletal relationship with fewer side effects and reducing the need for patient compliance.[2] Another factor in Class II appliance therapy is treatment timing.[3-4] Settled posterior occlusion and over correction of deep bite seems to be a factor associated with long-term stability of the Class II correction. Malmgren and colleagues[5] and Pancherzet al.[6] have found that for best results, functional appliances should be used during or just after the peak growth period. The TFBC is an appliance of choice in majority of the cases with mandibular skeletal discrepancies for the correction of the Class II malocclusion.[7] Various short and long-term treatment results have shown that the desired corrections which are obtained by TFBC appliance are stable and favorable.[8]

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