EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 2
1147-1150
Year: 2018

MINIMALISTIC APPROACH FOR THE CORRECTION OF ANTERIOR CROSSBITE- A CASE REPORT

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Article Received on 19/12/2017 **Article Revised on 09/01/2018** **Article Accepted on 30/01/2018**

ABSTRACT

Background: This article reports the orthodontic diagnosis and treatment planning carried out on 19 year-old male Chinese patient with esthetic and functional complaints. He presented with Angle'S Class I malocclusion with anterior crossbite and mild crowding in both maxillary and mandibular arches, in addition to a slightly convex to straight facial profile. Anterior crossbite can be defined as reverse overlap of incisors. Crowding can be referred to as a discrepancy of tooth size in relation to arch size/ arch length resulting in malalignment of teeth due to less space. Orthodontic treatment did not require extraction. Crossbite was corrected by dental expansion and protrusion of selective teeth, which contributed to alignment and leveling of teeth, in addition to improving the patient's facial profile. **Result:** At treatment completion, patient's self-esteem had significantly improved. Good facial proportions were observed in frontal view, with patient's profile improved due to an increase in lip volume as a result of incisor protrusion. **Conclusion:** Patients should be monitored carefully during adolescence to avoid such complex treatments.

KEYWORDS: Anterior crossbite, crowding, Corrective Orthodontics, Non-extraction case.

INTRODUCTION

Anterior crossbite can be defined as reverse overlap of incisors[1]. Most commonly found in Class III patients with a rarer occurrence among other classes. Crossbite can cause excessive attrition, poor masticatory efficiency, poor gingival health and TMJ problems[2]. Crowding can occur due to discrepancy between Arch width-tooth material/Arch length-tooth material. Fixed orthodontic appliances are indicated due to ease of use and availability. This report presents 19 year old male with Angle's Class I malocclusion, anterior crossbite and mild crowding in both maxillary and mandibular arches. The patient reported the following: "I am embarrassed of smiling. I want to have my teeth fixed because they are not aligned, which makes it difficult to bite."

DIAGNOSIS

This 19 year old male was diagnosed as Angle's Class I malocclusion, anterior crossbite and mild crowding in addition to a slightly convex to straight facial profile (Fig1). His dental history included poor oral hygiene, unchanged tongue position during physiologic movements and no prior orthodontic treatment have been performed. On clinical examination normal molar and canine relationship was recorded, 12 and 22 were in crossbite and 13 in edge to edge relation with its lower counterpart (Fig2). Lower midline was shifted to right by 3mm, reduced overjet overbite. Crowding of 5mm in upper dental arch was recorded while lower arch was crowded anteriorly by 2mm. 13 and 33 was rotated mesiolabially. Cephalometric findings revealed Skeletal Class I towards Class III (mild retrognathic Maxilla) with ANB of 1^0, SNA 81^0 and SNB of 80^0, (Fig-3)with proclined upper incisors and protrusive upper and lower lips.

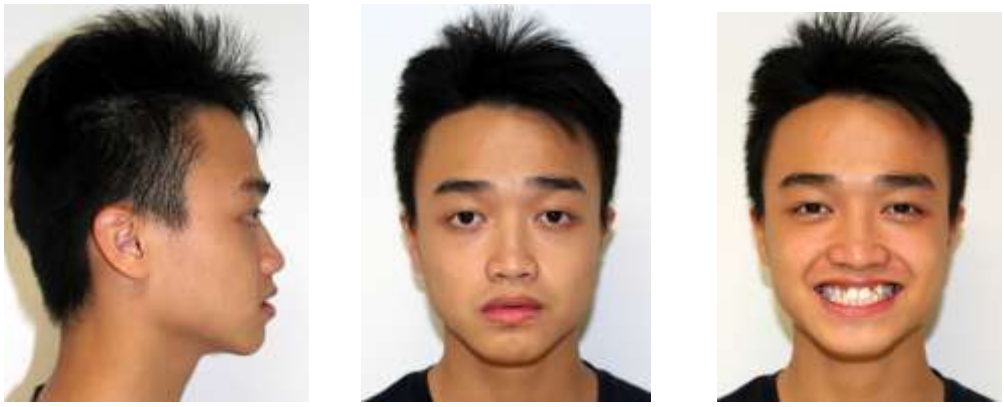

Fig. 1: Extra oral Pre-treatment photographs.

Fig. 2: Intraoral Pre-treatment photographs.

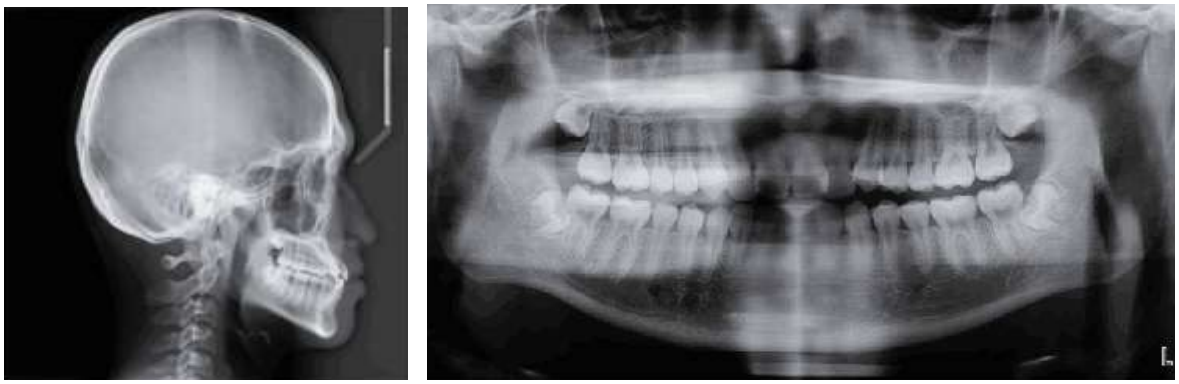

Fig. 3: Pre-treatment lateral cephalogram and OPG.

TREATMENT OBJECTIVES

To correct the anterior crossbite, relieve the crowding and align the anterior segment to achieve Class I incisor relationship with complete interdigitation of entire dentition.

TREATMENT PLAN

Given that the patient presented with anterior crossbite of both upper lateral incisors. Treatment plan aimed at relieving the crossbite by means of a fixed orthodontic appliance, providing a little labial flaring of anterior teeth in ideal occlusion and expansion of upper arch. The orthodontic fixed appliance was bonded on the upper teeth initially followed by the lower teeth in 9th week using the MBT 0.022 inch Preadjusted Edgewise Appliance. Levelling and alignment was achieved with continuous arch wires, starting with 0.014 nickel-titanium and progressing to a 0.017 × 0.025- stainless steel rectangular wire. Posterior bite block of glass ionomer cement has been given for 4 weeks to provide clearance for upper incisors to procline. By mid of 8th week crossbite between 12 and 42 became edge-to-edge, crossbite over 22 eliminated, rotation of 21 was reduced. Later cross elastic was given to match the midline. The

appliance has been removed after establishing correct intercuspation and due to patient's attrition to different country for his further studies. Hawley's retainer has been given to the patient along with cross elastics for 4 weeks, followed by continuing the retainers only to be used full-time (except for meals and oral hygiene) during six months, 12 hours per day during the following six months and while sleeping during the last six months of retention.

An alternative treatment plan would include extraction of the four first premolars. This treatment option, however, does not allow enough protrusion of incisors and, as a result, does not improve lip support. Moreover, after some years, it would worsen the patient's facial profile[3-5].

RESULTS

At treatment completion, patient's self-esteem had significantly improved. Good facial proportions were observed in frontal view, (Fig-4) with patient's profile improved due to an increase in lip volume as a result of incisor protrusion. Upper lip position was significantly improved by the crossbite correction. Molar and canine relationships were obtained in key to occlusion. Anterior crossbite were corrected by dental expansion of the maxillary arch and proclination of lateral incisors (Fig-5). Normal overjet and overbite were obtained.

Fig. 4: post-treatment extra oral photographs.

Fig. 5: Post-treatment intraoral photographs.

DISCUSSION

Nowadays patients are more concerned about their esthetic appearance in contrast to the ideal orthodontic norms of occlusion. Comprehensive orthodontic treatment needs tedious and time consuming efforts to achieve the perfect ideal occlusion whereas minor tooth movement allows a direct approach to address the patient's primary concern with minimal adjunctive therapy. Anterior crossbite must be treated in primary or mixed dentition, leaving them till the eruption of permanent dentition can lead to very limited options of treatment provision. We managed moderate crowding of patient by moderate dental expansion and proclination which led to well aligned arches without extraction of any permanent tooth to gain the required space. After discussing all the treatment options with patients and parents, permanent tooth extraction was ruled out and partial dental proclination with expansion was selected as the ideal method to establish positive overjet and overbite. Some ethnicities due to certain environmental

or biological factors are predisposed to develop certain dental anomalies[6].

Ideal results can be achieved by enforcing isolated movements to single tooth effortlessly. Patient education and compliance plays an important role towards better and more stable outcomes. Patient should be continuously motivated and followed up to avoid relapse of minor complication which could jeopardize the quality of treatment provided.

CONCLUSION

Patients should be monitored carefully during adolescence to avoid such complex treatments. If patient was referred to a specialist early, full fixed appliance could have been avoided. As our patient was adult on arrival, treatment was planned and executed with limited alternatives and set goals were accomplished.

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