

MILD SKELETAL CLASS III MALOCCLUSION TREATED NON-SURGICALLY WITH A COMBINATION OF COMPENSATION MECHANICS AND FIXED ORTHODONTIC APPLIANCE : A CASE REPORT

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ABSTRACT

A 15 years old patient came to Dental Centre, Islamabad, with chief complaint of anterior cross bite and an unaesthetic smile. Extra oral examination showed a prognathic mandible, deficient midface, low smile line and a concave lateral profile. There was reverse overjet of -2.5mm and reverse overbite was 6mm, which was corrected to 2mm and 3.5mm respectively. Treatment was successfully completed with a non-surgical protocol in 16 months.

Key words: Anterior cross bite, expansion, incisor proclination

INTRODUCTION

A true skeletal class III malocclusion is characterized by a prognathic mandible, deficient midface or a combination of both ¹⁻⁴. On extra oral examination, these patients exhibit a concave facial profile, a retrusive nasomaxillary area and a prominent lower jaw. The lower lip is often protruded relative to upper lip. The maxillary arch is usually narrower than the lower. The overjet & overbite can range from reduced to an edge to edge contact or reverse ⁵.

Class III malocclusions may always not be skeletal. They can be pseudo-class III malocclusions or only dental class III malocclusions. A pseudo-class III malocclusion is sometimes caused by forward shift of mandible to avoid incisal interferences. In such cases, it is important to establish the inter-occlusal relationship with teeth in centric occlusion ⁶.

Usually for many skeletal class III malocclusions, surgical treatment can be the best alternative. Depending on the amount of skeletal discrepancy, surgical correction may consist of mandibular setback, maxillary advancement or combination of both procedures⁷. However in growing patients maxillary protraction has also been reported to be a successful treatment option⁸.

The dilemma we face in Pakistan is that, majority of these patients reject or are not willing to accept orthopedic or surgical therapy and persist in their pursuit of orthodontic treatment. The main reason of this is that patients are shy to wear an extra oral device. In case of a surgical option the patients first of all get scared from the word "Surgery" and secondly the high cost of surgical therapy. Since the beginning of 2008, Pakistan's economic outlook has taken a dra-

matic nose dive, which has basically affected the middle class and the poor, so many times we have to make such a treatment plan which is affordable for the patient, and therefore a camouflage treatment is planned where ever possible.

CASE REPORT

A 15 years old patient came to Dental Centre, Islamabad, with chief complaint of reverse anterior overbite and an unaesthetic smile. Extra oral examination showed a prognathic mandible, deficient midface, low smile line and a concave lateral profile (Fig.1). There was reverse overjet of 2.5mm and reverse overbite was 6mm.

Cephalometric analysis showed a true skeletal problem with a prognathic mandible, retruded maxilla, low facial height, and mandible rotated anticlockwise (Table.1).

Treatment objective was to correct the reverse overjet and overbite, create a class I canine and molar relationship, improve profile, increase facial height, and improve the smile line.

To meet most of these treatment objectives we decided on a nonsurgical treatment protocol. Banded type of hyrax appliance was used for rapid maxillary expansion for 16 days. After obtaining desired expansion, the hyrax was used as retainer for next 7½ months. Upper central and lateral incisors were bracketed to start leveling and alignment of anterior segment. After leveling upper central and lateral incisors, a proclination arch was passed to procline upper anterior teeth. Meanwhile, lower teeth were banded and bracketed to start leveling and alignment. Sufficient proclination of upper anterior teeth was achieved in six months and overjet was created (Fig. 2).

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Then hyrax expansion screw was removed, upper first molars of both sides were banded and rest of upper teeth was bracketed. The proclination arch was removed and straight arch wire was passed in the upper arch.

The case was finished in 16 months, with good intraoral and extra oral results (Fig 3). Post treatment panoramic radiograph revealed excellent root paralleling (Fig 4). Upper and lower Hawley retainers were placed in order to retain results that were achieved.

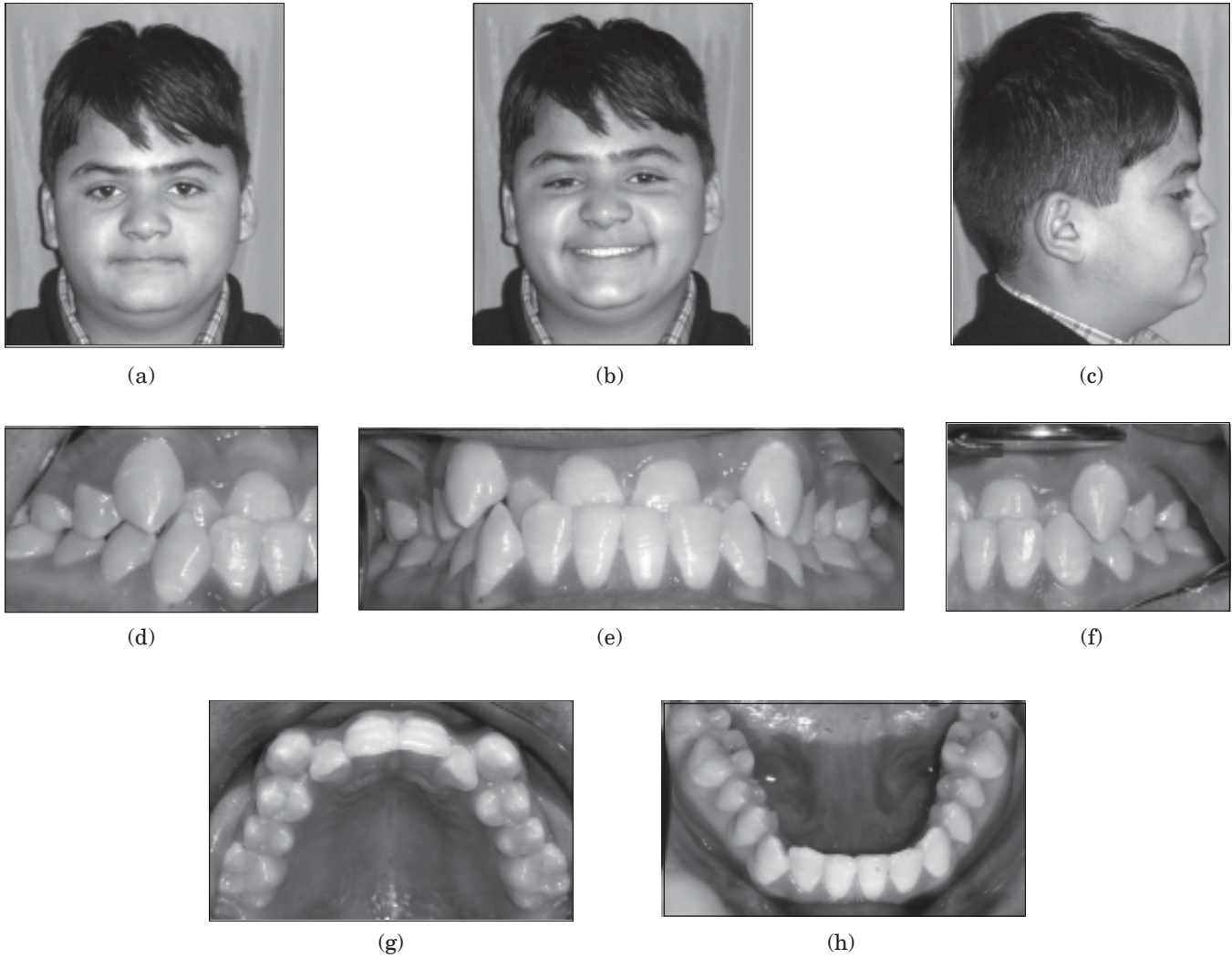


Fig 1: Pretreatment extra-oral and intra-oral photographs



Fig 2: Proclining the upper incisors

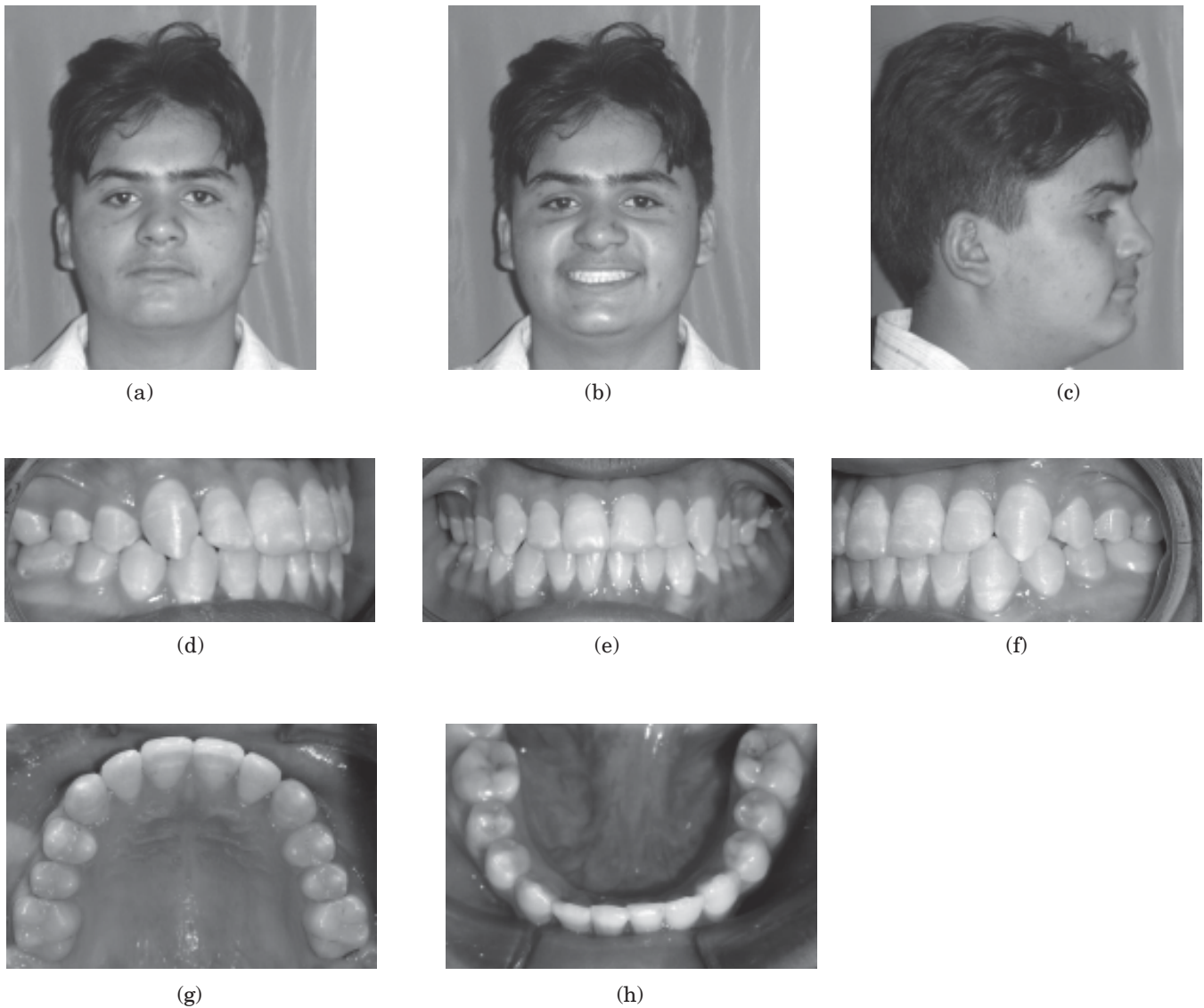


Fig 3: Post-treatment extra-oral and intra-oral photographs

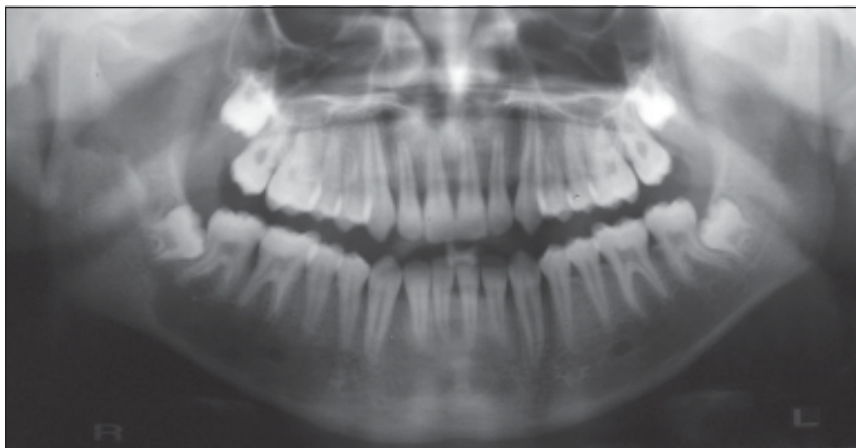


Fig 4: Post-Treatment panoramic radiograph showing root parallelism



_____ Before Treatment
 After Treatment

Fig 5: Superimposition (on the SN plane and registering on sella) of lateral cephalometric radiographs before and after treatment

VALUE	Pre Treatment	Post Treatment	Change
<SNA	81.5°	81°	0.5°
<SNB	86°	82°	4°
<ANB	-4.5°	-1°	3.5°
<UI-SN	102°	122°	20°
<SN-GoMe	26°	28.5°	2.5°
<Y-axis	63°	66°	3°
IMPA	91°	89°	2°
Sum of Inner Angles	383°	387°	4°
Upper Lip to S-line	-4 mm	-3 mm	1 mm
Lower Lip to S-line	-1 mm	-2.5 mm	1.5 mm
Over Bite	6 mm	2.5 mm	3.5 mm
Over jet	-2.5 mm	2 mm	4.5 mm

TABLE 1: CEPHALOMETRIC READINGS OF THE CHANGES BEFORE AND AFTER TREATMENT

DISCUSSION

When ever a non-surgical treatment plan can bring about good results, it should always be considered instead of a surgical option in some patients⁹⁻¹⁰. When making a treatment plan for this patient, we decided that a non-surgical therapy would bring acceptable results without the additional hassle of a surgical procedure. In any case the patient was reluctant for a surgical procedure and even was not ready to wear an orthopedic appliance.

The initial treatment plan however did not include any surgical procedure or face mask wear. Face mask wear would have been a good option, but the hand and wrist radiograph of the patient showed that active growth was over, therefore true skeletal effects of a facemask would not have been possible¹¹. Kim and Graber reported that even in patients where active growth is complete facemask therapy does produce desired results but less pronounced¹². Therefore, we did decide upon facemask usage if we were unable to get desired results otherwise.

Initially expansion of upper arch and proclination of the upper incisors was planned. The desired clinical results were achieved, but cephalometric analysis showed that there was no advancement of point A, whereas point B was reduced (Fig 5). This accounted for a clockwise rotation of the mandible, bringing the B point back and also increasing the facial height of the patient which was desired (Table 1).

Our basic aim was to treat the patient without surgery and any other mechanics which was dependant

on patient cooperation. We achieved good results and were successful in treating the patient according to the initial treatment plan without modifying it.

CONCLUSION

This case report presents the non-surgical orthodontic treatment of a Class III malocclusion treated with a combination of compensation mechanics and fixed orthodontic appliance. It can easily be suggested that in some, carefully selected cases, this approach can be a good treatment option.

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REFERENCES

- Sanborn RT. Differences between the facial skeletal patterns of Class III malocclusion and normal occlusion. *Angle Orthod* 1955; 25: 208–22.
- Guyer EC, Ellis EE, McNamara JA Jr, Behrents RG. Components of Class III malocclusion in juveniles and adolescents. *Angle Orthod* 1986; 56: 7–30.
- Williams S, Andersen CE. The morphology of the potential Class III skeletal pattern in the growing child. *Am J Orthod Dentofac Orthop* 1986; 89: 302–11.
- Spalj S, Mestrovic S, Lapter Varga M, Slaj M. Skeletal components of class III malocclusions and compensation mechanisms. *J Oral Rehabil*. 2008 Aug;35(8):629-37.
- Ngan P, Hagg U, Yiu C, Merwin D, Wei SHY. Soft tissue and dentoskeletal profile changes associated with maxillary expansion and protraction headgear treatment. *Am J Orthod Dentofac Orthop* 1996; 109: 38–49.
- Clark JR, Hutchinson I, Sandy JR. Functional occlusion: II. The role of articulators in orthodontics. *J Orthod* 2001; 28: 173–7.
- Popp TW, Gooris CGM, Schur AJ. Nonsurgical treatment for a Class III dental relationship: a case report *Am J Orthod Dentofac Orthop* 1993; 103: 203–11.
- Haroon Shahid Qazi & Amjad Al-Taki. Modified maxillary protraction head gear used for the correction of Class III skeletal malocclusion with anterior open bite. *JCPSP* 2005, Vol 15 (12): 823-825.
- Ibrahim Erhan Gelgo` r, Ali Ihya Karaman. Non-surgical treatment of Class III malocclusion in adults: two case reports: *Journal of Orthodontics*, Vol. 32, 2005, 89–97.
- Kanno T, Mitsugi M, Hosoe M, Sukegawa S, Yamauchi K, Furuki Y. Long-term skeletal stability after maxillary advancement with distraction osteogenesis in on-growing patients: *J Oral Maxillofac Surg*. 2008 Sep;66(9): 1833-46.
- Hamamci N, Ba`aran G, Sahin S. Nonsurgical correction of an adult skeletal class III and open-bite malocclusion: *Angle Orthod*. 2006 May;76(3):527-32.
- Kim JH, Viana MAG, Graber TM, Omerza FF, BeGole EA. The effectiveness of protraction face mask therapy: a metaanalysis: *Am J Orthod Dentofacial Orthop*. 1999;115:675–685.