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RESEARCH ARTICLE

Camouflage treatment of Class II division I using mini implants - A case report

Pratik Patel[1], Ravi Shanthraj[2], Nekta Garg[3], Anisha Vallakati[4], Subodeep Paul[5]

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Corresponding Author

Dr. Pratik Patel

Abstract

15-year female presented a skeletal Class II relation with 10 mm of overjet, 70% overbite and unilateral lingual posterior crossbite. Camouflage treatment with first premolars extraction was planned to correct upper incisors proclination and achieve lip competency. Mini-implants were used to protract the lower molars bilaterally in order to correct Class II molar relation. Post treatment incisors inclination was improved and bilateral class I molar relationship was achieved. As the incisors were retracted, lip competency, facial convexity and nasolabial angle improved.

INTRODUCTION

Class II malocclusion is highly prevalent worldwide[1–4] and its treatment is one of the most frequent in the orthodontic offices[5, 6]. Class II malocclusions represent a great percentage of skeletal discrepancies. The treatment of these disorders depends on various diagnostic factors including age (growing or non-growing patients), the skeletal pattern and patient compliance[7]. An increasing number of adolescent patients have become aware of orthodontic problems and demand quality treatment for the same, in the shortest possible time with increased efficiency and reduced costs[8]. The main possible approaches to treat a skeletal Class II malocclusion are: growth modification, camouflage treatment i.e. displacing the teeth to obtain proper functional occlusion despite the skeletal discrepancy; and surgical repositioning of the jaws[9, 10]. The methods for correcting class II malocclusion include: extra oral appliances, functional appliances and fixed appliances associated with class II mechanics[11]. The camouflage treatment in class II malocclusion includes extractions of 2 maxillary premolars or 2 maxillary and 2 mandibular premolars, depending on the dento-alveolar characteristics[12]. This case report describes the camouflage orthodontic treatment of a female patient with Class II division 1 malocclusion associated with mandibular deficiency.

CASE REPORT

15-year old female reported with chief complaint of “my front teeth stick out”. No relevant medical history was reported. The extra-oral examination (Fig.1) revealed a mesocephalic head shape, mesoprosopic and symmetrical face, convex profile, acute nasolabial angle with incompetent lips which were protrusive. The patient showed a good range of mandibular movements and no tempromandibular joint symptoms. Intraoral examination revealed a Class II molar relationship (half cusp on the right and full cusp on the left), 70 % overbite, 10 mm of overjet and unilateral lingual posterior crossbite. Both arches were grossly symmetrical. The arch perimeter analysis suggested 3 mm of tooth material excess in upper arch and 2 mm in lower arch. Upper midline was shifted by 1.5 mm to right side with respect to facial midline. Midline diastema of 1.5 mm was present and blanch test was positive. (Fig 2) Panoramic radiograph showed presence of all 32 teeth with no evidence of bone loss. The lateral cephalometric radiograph indicated ANB of 6° and Wits appraisal revealed AO ahead of BO by 5 mm, indicative of a Class II skeletal pattern. An SNB angle of 72° indicated that the mandible was retrognathic. (Fig 3) The skeletal pattern was hyperdivergent

as evidenced by the SN-MP angle of 39°. The patient had proclined maxillary and mandibular incisors with U1-NA-8.5 mm /36°, L1-NB-7.5 mm /31°.

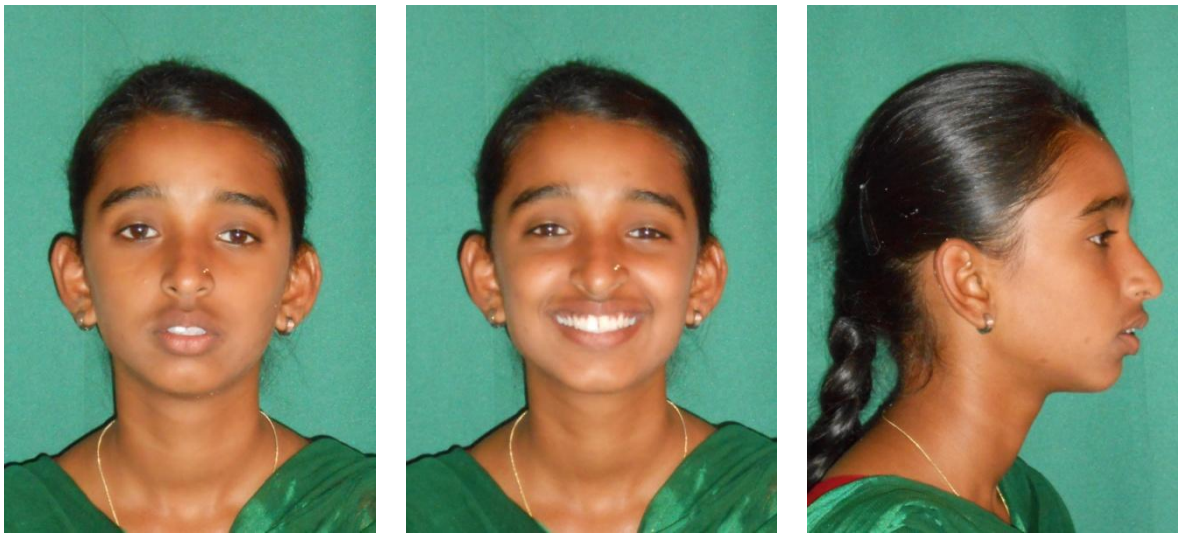

Fig 1: Pretreatment facial photographs

Fig 2: Pretreatment intra oral photographs

TREATMENT OBJECTIVES

Treatment objectives in the maxillary dentition were to reduce the upper anterior proclination and correct the unilateral posterior cross bite with closure of midline diastema. In the mandibular arch, treatment was aimed at relief of lower anterior crowding and lower anterior proclination. Treatment objectives for the occlusion were to correct Class II molar and canine relation into Class I relationship and establishing ideal overjet and overbite.

TREATMENT PLAN

The main criteria in determining the applicable treatment plan was the severity of overjet, overbite and a Class II skeletal molar relation. Four first premolars were extracted to reduce dental proclination and to correct a Class II molar relation. The patient exhibited lip strain on closure due to excessively proclined maxillary incisors and increased overjet. Thus absolute anchorage was planned to retract the incisors and prevent mesial movement of the maxillary molars. To enhance anchorage, a high pull headgear with transpalatal arch was placed from first molar to first molar.

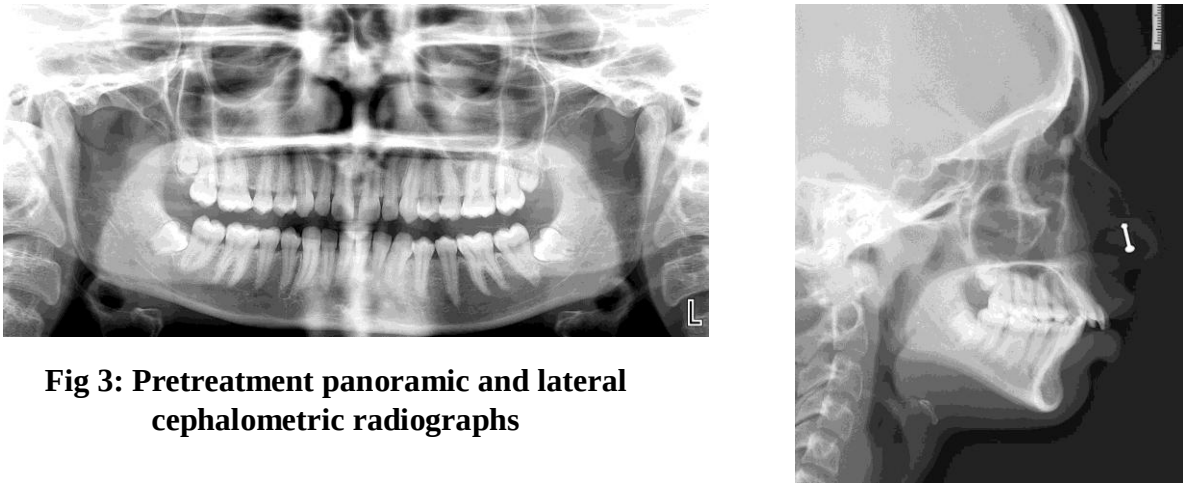

Fig 3: Pretreatment panoramic and lateral cephalometric radiographs

TREATMENT PROGRESS

MBT appliance (Ormco, Glandora, CA) 0.022×0.028″ slot was used. Seprators were paced mesial and distal to molars[13]. An expanded transpalatal arch was placed on the banded first molars to correct unilateral cross bite and to enhance anchorage. Alignment and levelling was accomplished with following sequence of arch wires: (a) 0.016″ heat activated nickel-titanium arch wires (b) 0.018″ stainless steel arch wires and (c) 0.017×0.025″ stainless steel arch wires.

Fig 4: Midtreatment intraoral photographs

The arch wires were cinched distal to molar to avoid maxillary and mandibular incisor proclination. After aligning and levelling, the maxillary and mandibular dentition (Fig 4) was consolidated on 0.017×0.025″ stainless steel arch wires. Frenectomy was performed to relieve the high frenal attachment in the upper arch. Space closure was accomplished by en masse retraction of anterior in the upper arch by NiTi coil spring on 0.019×0.025″ stainless steel arch wires. After overjet and overbite reduction, mini implants (Fig 5) were placed distal to the canines in lower arch and the lower molars were protracted using NiTi coil springs, assisted by Class II elastics. Final finishing was done by 0.021×0.025″ titanium molybdenum alloy arch wires. The settling was accomplished by 0.021×0.025″ braided stainless steel arch wires. Case was debonded with upper and lower bonded lingual retainers. The overall treatment took 23 months. The patient is being recalled every six months for follow up.

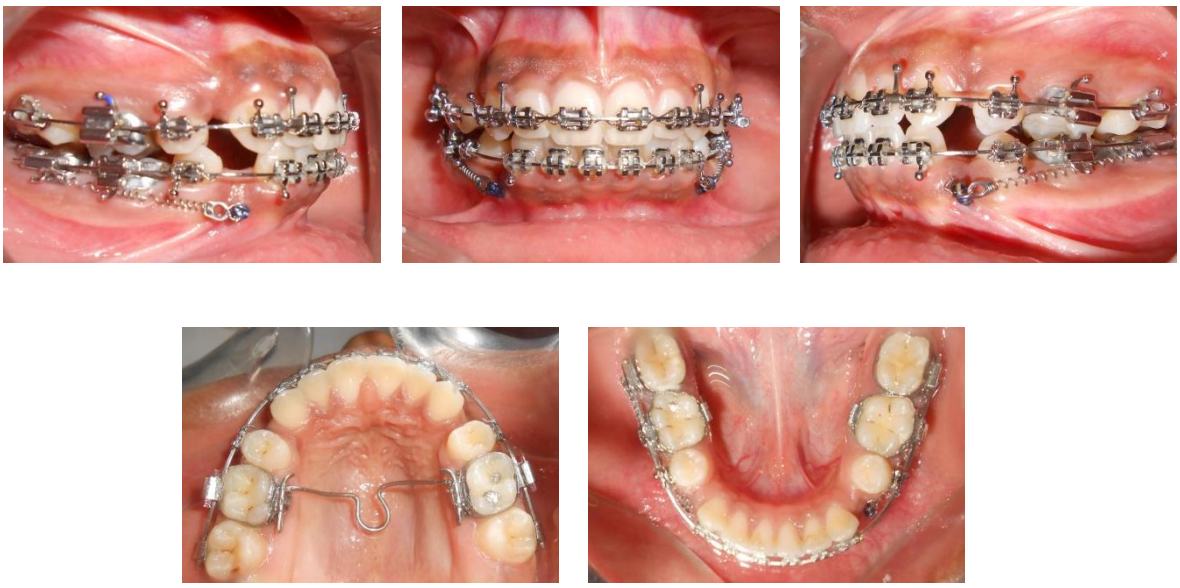

Fig 5: Midtreatment intraoral photographs

TREATMENT RESULTS

The change in the patient's facial esthetics was the most impressive part of her treatment. With extraction of the first premolars, 7 mm retraction of anterior was achieved. Her lip incompetency (Fig 6) and facial convexity were reduced. The Class II molar and canine relationship was corrected to Class I relationship. Midline diastema was closed and unilateral posterior lingual cross bite was corrected. Post treatment intraoral photographs and lateral cephalogram (Figs 7-8) showed that the maxillary and mandibular incisors were inclined appropriately. The soft tissue chin thickness improved as the lip strain was reduced. The panoramic radiograph (Fig 8) showed adequate root parallelism in both upper and lower arches.

Fig 6: Posttreatment facial photographs

Fig 7: Posttreatment intraoral photographs

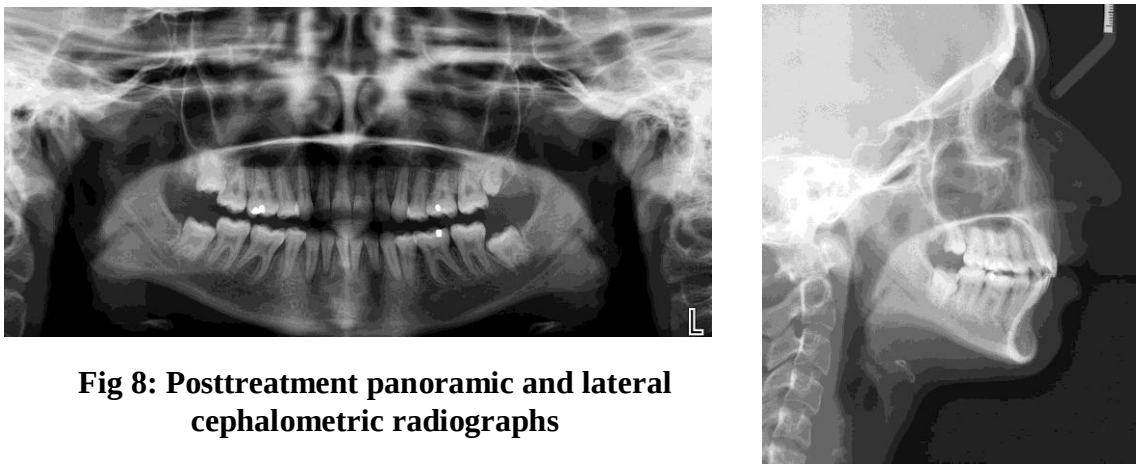

Fig 8: Posttreatment panoramic and lateral cephalometric radiographs

Table 1. CEPHALOMETRIC FINDINGS			
VARIABLE	**STANDARD**	**PRE-TREATMENT**	**POST-TREATMENT**
SKELETAL			
SNA	82° ± 2°	78°	78°
SNB	80° ± 2°	72°	72°
ANB	2°	6°	6°
GO GN – SN	32°	39°	37°
WITS APPRAISAL	0 mm	5 mm	4 mm
DENTAL			
U1 – SN	102°±2°	115°	98°
U1 – NA	4 mm / 22°	8.5 mm / 36°	1.5 mm / 18°

L1 – NB	4mm / 25°	7.5 mm / 31°	5.5 mm / 27°
IMPA	92°±5°	105°	99°
SOFT TISSUE			
NASOLABIAL ANGLE	90-110 mm	78°	96°
U LIP – S LINE	0 mm	4mm	0mm
L LIP – S LINE	0 mm	4mm	1mm

DISCUSSION

Treatment objectives should be directed toward an ideal. Treatment of a Class II patient requires careful diagnosis and a treatment involving aesthetic, occlusal and functional considerations[14]. When comparing the alternative treatment plans, it is also important to evaluate treatment efficiency, determined by whether and to what extent the treatment goals were met by improving dental relationship and dento-facial aesthetics[15]. The goal of dental camouflage is to correct the skeletal relationships by extracting few teeth followed by orthodontically repositioning the teeth in the jaws. The repositioning of the teeth, as in the retraction of the protruding incisors, is often termed as camouflage. Variations in the extraction sequences, which include the upper premolars or the upper and lower first or the second premolars, have been recommended by different authors for a variety of reasons[16-21]. The camouflage option we considered appropriate for our case was extraction of all first premolars. Following premolar extraction expanded TMA transpalatal arch was placed on banded first molars to correct unilateral crossbite, owing to larger range of action of TMA compared to stainless steel wire. MBT edgewise appliance was used in our case owing to superior palatal root torque in MBT incisor brackets, which compensate torque loss on the upper incisors during usage of light class II elastics. Lower incisors tend to procline during leveling and in response to class II elastics, which is compensated by the labial root torque of MBT lower incisor brackets[22]. After overjet reduction, molar correction was done by placement of an implant distal to the lower canine, in order to avoid extrusion of molar which would cause unwanted caudal rotation of the mandibular plane.

CONCLUSION

To achieve the desired results there are several diagnostic methods that support the obtaining of an individualized treatment plan and in this way achieve the visualized objectives. Extractions in many cases remain a useful tool to achieve a proper occlusion however, they must be planned properly. In this case, extraction space of first premolars was utilized to correct the dental proclination and to achieve a Class I molar and canine relationship.

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