

Challenging case to orthodontist-facial asymmetry and open bite: A case report

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ABSTRACT

Background: This clinical case report describes the orthodontic treatment of 23year adult male patient with Angle's class II division I malocclusion with anterior open bite and facial Asymmetry. The principle of orthodontic treatment is the occlusal plane change and intrusion mechanism of posterior teeth with mini screws to make counter-clockwise rotation of mandible and reduce anterior open bite. Correction of this malocclusion is challenging due to difficulties in determining and addressing the etiologic factors, and the high relapse rate.

Keywords: Orthodontics, open bite, facial symmetry.

INTRODUCTION

Anterior open bite (AOB) is defined as a condition in which there is no overlap of the lower incisor crown with the upper incisor crown when the mandible is in full occlusion. AOB are among the most challenging and difficult tasks for clinicians involved in orthodontic treatment (Kim 1974). It may be due to a combination of heredity, unfavorable growth, environmental factors, tongue and thumb behaviors, abnormal orofacial muscle function and the interaction of these factors with skeletal growth (Linder-Aronson and Woodside et al. 1986) it would lead to difficulties in speech, cutting, chewing, and swallowing, and can affect psychosocial development due to its esthetic impact. Various treatment options are available for the correction of an anterior open bite such as extrusion of the anterior teeth, the uprighting of posterior teeth with multi-loop edgewise arch wire (MEAW) and inhibition of molar eruption with bite block and headgear during growth, Intrusion of posterior teeth with TADs, Infra-zygomatic crest implants, buccal shelf implants and bite Blocks. An alternative treatment option is surgical correction. Rotate the mandible for changing the occlusal plane is the key

step in the treatment. It always achieves better results in a better vertical control. Although satisfactory outcomes can be achieved, the complexity, risks, and costs of surgery have initiated a search for other options.

CASE REPORT

The patient, aged 23 years, presented the chief complaints of wide mouth opening and unesthetic profile. The facial photographs showed retrognathic mandible and increased height of the lower facial third with facial Asymmetry.(fig.1(A) The intraoral photographs showed Class I molar relation on right side, class II molar relation on left side, 5-mm anterior open bite, 8 mm overjet and 6 mm lower midline deviation to the left. Clinical examination revealed skeletal open bite, infantile swallowing pattern, anterior tongue posture at rest during speech or swallowing, Poor lip sealing with consequent psychological effects. In maximum intercuspation, occlusal contacts occurred only at the molars.(fig.1.B)

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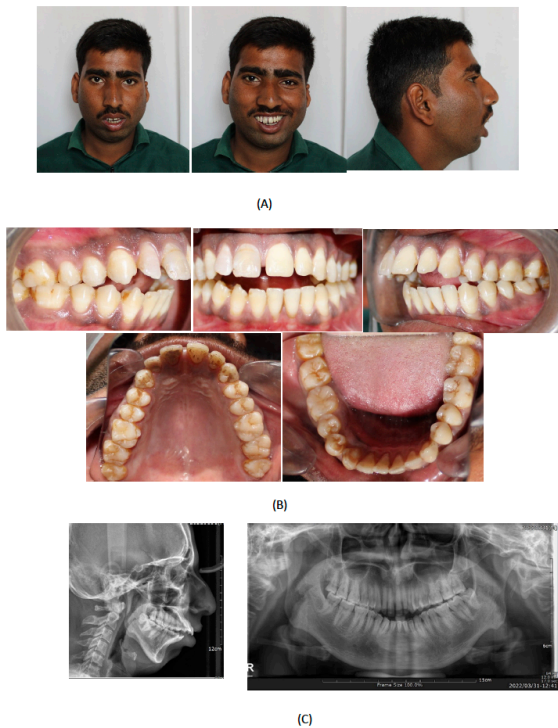


Figure 1: (A).Pretreatment extraoral photographs (B) Pretreatment intraoral photographs (C) Pretreatment radiographs.

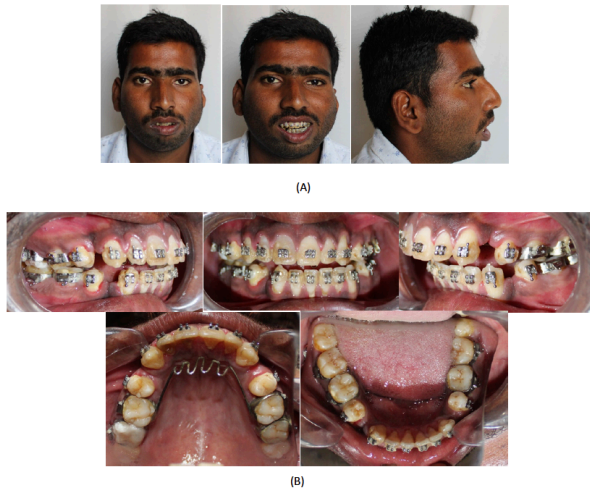


Figure 2: (A) mid treatment extraoral Photographs (B) mid treatment intraoral photographs.

Cephalometric analysis revealed Class II sagittal skeletal relationship, The maxillary and mandibular incisors were buccally tipped and protruded, both upper and lower lip were procumbent. In the vertical plane the skeletal pattern was quite unfavorable. The McNamara analysis evidenced mandibular retrusion in relation to the cranial base

due to an extremely increased lower anterior facial height.

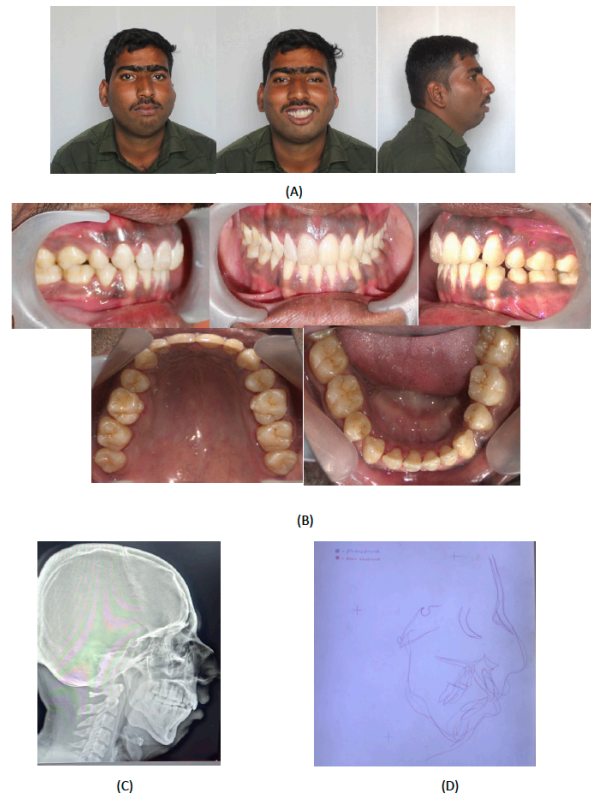


Figure 3: A). Post-treatment extraoral Photographs (B) post-treatment intraoral photographs(C) post-treatment radiograph (D)pretreatment and post-treatment superimposition.

The panoramic radiograph showed all teeth, including the four third molars, with no noticeable root resorption. Root canal treatment was done with 11. No caries or periapical lesions were seen. (fig.1.C)

Treatment plan and mechanics applied.

The treatment goals were to achieve normal occlusion, correct the vertical and maxillomandibular discrepancy, close spacing, and achieve ideal overjet and overbite, improving function, facial esthetics, and smile characteristics.

The following treatment alternatives could be considered

A) SURGICAL PLAN

Presurgical orthodontics with Extraction of all first premolars after levelling and alignment of both

upper and lower arches followed by subapical osteotomy in maxillary and mandibular arch for Open bite correction then post-surgical finishing and detailing.

Table 1: Cephalometric values before and after treatment.

SKELETAL PATTERN	NORMAL	BEFORE TREATMENT	AFTER TREATMENT	DIFFERENCE
SNA	82°	83°	78°	5°
SNB	80°	70°	72°	3°
ANB	2°	13°	6°	7°
WITS	♀ 0 ± 2 mm ♂ 1 ± 2 mm	AO is ahead of BO by 14 mm	AO is ahead of BO by 8 mm	9 mm
ANGLE OF CONVEXITY	0°	26°	16°	10°
Y AXIS	59°	76°	67°	9°
FACIAL ANGLE	87°	73°	85°	11°
SN-Go Gn	32°	46°	43°	3°
FMA	25°	47°	40°	7°
DENTAL PATTERN				
IMPA	90°	112°	89°	23°
1.NA (degrees)	22°	33°	12°	21°
1-NA (mm)	4 mm	7 mm	2 mm	5 mm
1.NB (degrees)	25°	51°	35°	16°
1-NB (mm)	4 mm	15 mm	9 mm	6 mm
Interincisal angle	130°	85°	125°	40°
PROFILE				
Upper lip — S-line	0 mm	5 mm	3 mm	2 mm
Lower lip — S-line	0 mm	8 mm	5 mm	3 mm

B) NONSURGICAL PLAN

Levelling and alignment with MBT fix mechanotherapy with 0.022 bracket system, after levelling and alignment extraction of all first premolars followed by posterior intrusion and retraction of Anteriors with the help of TAD's. then finishing and detailing.

Treatment progress

Patient was not ready for surgical plan so we decided to do this case by dental camouflage. The patient required molar intrusion for occlusal plane

correction, so as to rotate the mandible in a counter-clockwise direction also to correct the habit of tongue thrust tongue Crib were soldered on upper first molar bands and cemented for 9 months.(fig.2.B) At the same time anterior retraction also needed for improving protrusive lips was essential. Therefore, all first premolar extraction was done after initial levelling and alignment In order to give intrusive forces for occlusal plane cant correction, so 4 Mini screws (1.3 mm × 6.5 mm) were placed in between second premolar and first molars after initial leveling and alignment. posterior intrusion and anterior retraction was done with the help of TADs.

Treatment Results

Force for retraction was 100-150 gm and force for maxillary posterior segment intrusion was 200-300 gm. A harmonious facial balance, improved smile, and good interdigitation were achieved at the end of treatment(fig3.A). The intraoral photographs and cephalometric analysis showed that there was a good improvement in the overbite, from -5 to 2 mm(fig.3.B), and decrease in maxillary and mandibular protrusion from 85° to 125°, as a result of the counterclockwise rotation. other cephalometric values were added in table 1. The maxillary molars were intruded by 4mm and maxillary incisors extruded by 3 mm. The lower incisors extruded by 1mm. There was no obvious evidence of clinically significant root resorption or dental caries throughout the treatment. The cephalometric superimposition shows good improvement after treatment(fig.3.D)

DISCUSSION

It is believed that approximately 30% of the general population has malocclusions for which orthodontic treatment is highly necessary. [4] Dentofacial deformities, on the other hand, refer to a variety of dental and maxillo-mandibular abnormalities that frequently manifest as malocclusions. These conditions cannot be resolved with orthodontic therapy alone; instead, orthognathic surgery, which surgically aligns the upper and lower jaws, or both, is required, is the only viable course of treatment. People who have dentofacial abnormalities frequently exhibit reduced quality of life and difficulties with breathing, swallowing, chewing, speaking clearly, and lip closure/posture[21].

Esthetics motivates patients with dentofacial deformity to seek for orthodontic treatment and orthognathic surgery as a treatment option. Understanding the patient's main concerns and expectations, along with doing appropriate diagnostic tests, are essential in determining the best course of action, plan and accomplish a desirable results.

CONCLUSIONS

The surgical-orthodontic treatment is the usual method used to treat adult patients with dentofacial abnormalities by careful diagnosis and treatment planning, the problems could be treated effectively and efficiently by surgical method but some patients are not willing for surgical procedure so Orthodontic camouflage can be an effective treatment alternative for achieving functional occlusion, stability, and satisfactory esthetics in adult patients with mild to moderate skeletal malocclusion.

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