CASE REPORT

NON-SURGICAL MANAGEMENT OF ADULT MUTILATED SKELETAL CLASS III MALOCCLUSION -A MULTIDISCIPLINARY APPROACH

Dr. Partha Pratim Choudhury*, Dr. Ekta Lahoti**

ABSTRACT

Orthodontics for adult patients is increasingly gaining popularity.For treatment of adult Class III malocclusion, different methods have been practised. In the case presented here, the class III malocclusion was treated by extracting lower first premolars, using TADs for anchorage, intrusion utility arch for lower anterior intrusion and fixed prosthesis for replacing missing upper right lateral incisorto establish normal overbite, overjet and deliver best possible occlusion, esthetics and stability.

KEY WORDS

Adult orthodontics, Class III malocclusion, first premolars extraction, TADs, multidisciplinary, fixed prosthesis.

ABOUT THE AUTHORS

* Assistant Professor
Dept. of Orthodontics & Dentofacial Orthopedics
Dr. R. Ahmed Dental College & Hospital, Kolkata
**Clinical Tutor
Dept. of Dentistry
Calcutta Medical College & Hospital, Kolkata

CORRESPONDING AUTHOR

Dr. Ekta Lahoti
Clinical Tutor
Dept. of Dentistry, Calcutta Medical College & Hospital, Kolkata
13ekta@gmail.com

INTRODUCTION

The number of adult patients undergoing orthodontic treatment has increased over the last 2-3 decades[1]. The primary motivation for adults to undergo orthodontic treatment is to improve dentofacial appearance[2,3]. It has been found that approximately 80% of patients accept orthodontic therapy because of the aesthetic aspect rather than dental health and function[4].There are various methods to treat Class III malocclusion cases, as indicated by the anteroposterior disparity, patient's age and compliance. For adult patients, the treatment options may include surgery or use of mini-implants or extraction of lower premolars or a combination of these to achieve desired results. The conventional use of mini-implant anchorage in the lower posterior area is either interdental minicrews or extraradicular. Interdental miniscrews are primarily for maximal anterior retraction and vertical control. For better stability and satisfactory results in class III malocclusion, mostly a combination of surgical-orthodontic treatment is the best treatment choice[1]. However, many times to accommodate the patient's desire to avoid surgery, we finish the case with camouflage treatment and selective teeth extraction[5-8]. Here, we describe a case of skeletal class III malocclusion with anterior cross bite and missing upper second premolars and upper right lateral incisor.

CASE REPORT

A 26-year-old female patient presented with presence of spacing in upper front teeth region and protrusive lower jaw. Clinical examination showed that the profile was concave, no lip trap, lips were competent and there was no clicking or tenderness on opening or closing of jaws (Fig.1). She had missing upper second premolars and missing upper right lateral incisor and peg lateral on left side. Upper first premolars were RCT treated with prosthetic crowns placed. She had anterior crossbite, class Imolar relation on the left side and molar crossbite on the right side. Upper right first molar was mesiopalatally rotated. Canines were in class III relation on both sides. Lower incisors were

supraerupted and lower central line shifted 3mm to the left (Fig.2).

TREATMENT OBJECTIVES

The patient only wanted non surgical correction. Therefore, our treatment objectives included improving the patient's smile esthetics and facial profile while creating a more favourable occlusion to facilitate prosthetic replacement of missing teeth.

This included:

- Creating a normal overbite and overjet relationship.
- Intrusion of lower incisors keeping orthodontic forces very light.
- Correcting buccal overjet and de-rotating upper right first molar.
- Establishing class I molar and canine relation on both sides.
- Creating space to facilitate prosthetic replacement of missing upper right lateral incisor.
- Coinciding upper and lower dental midlines.

TREATMENT PROGRESS

Extraction of lower first premolars was done before starting orthodontic therapy. .022 slot MBT Preadjusted Edgewise appliance was bonded. Upper first molars were banded and a removable TPA was used to correct buccal crossbite and molar rotation. Alignment and levelling of the teeth were done with light forces using NiTi wires in the upper arch. Interproximal reduction was done to eliminate the black triangle between lower central incisors. Segmental arch mechanics was used to intrude lower incisors. 17x25 TMA wire was used to fabricate intrusion retraction arch for lower incisors (Fig.3a). Mini-implants were placed in lower posterior region to augment anchorage. Niti open coil spring was used on 17x25 ss wire in the upper arch to create space for prosthetic replacement of upper right lateral incisor (Fig.3b). During orthodontic treatment the patient was trained to maintain proper oral hygiene at home.

Fig. 1- Pre-treatment facial photographs

Fig. 2- Pre-treatment intraoral photographs

Fig. 3(a)- Treatment progress intraoral photographs.

Fig. 3(b)- Treatment progress intraoral photographs.

Fig 4a. - Post-treatment (without prosthesis) intraoral photographs

TREATMENT RESULTS

After an active orthodontic phase of 23 months, adequate space was created for prosthetic replacement of upper right lateral incisor (Fig. 4a). Class I molar and canine relation was achieved. Upper and lower dental midlines were coincident. At the end of orthodontic phase, cantilever bridge was given from upper right canine to replace upper right lateral incisor (Fig.4b). Composite build up was done to correct anatomy of upper left peg lateral. After treatment, fixed bonded retainers was given in both arches. Post treatment photographs presented changes in her facial appearance (Fig.5). Improved lip relationship, smile and facial esthetics were achieved. Patient's cooperation in oral hygiene maintenance was satisfactory. The patient was very satisfied with the treatment and had improved psychosocial confidence. The post treatment panoramic radiograph showed overall parallelism of roots. No significant root resorption was noted (Fig.7). Table 1. shows the changes in cephalometric parameters. The post-treatment cephalogram documents an acceptable orthognathic profile (Fig.6), but the ANB angle improved by only -2°. The skeletal response was typical for a camouflage treatment of a Class III skeletal malocclusion, that is increased vertical dimension of occlusion, flaring of the maxillary incisors and decreased inclination of the mandibular incisors. Accordingly, the cephalometric analysis showed that the mandibular plane angle was increased by 1 degree (Tab.1).

Fig 4b. - Post-treatment (with prosthesis) intraoral photographs

Fig 5. - Post-treatment facial photographs

Fig 6. Pre and post treatment lateral cephalogram

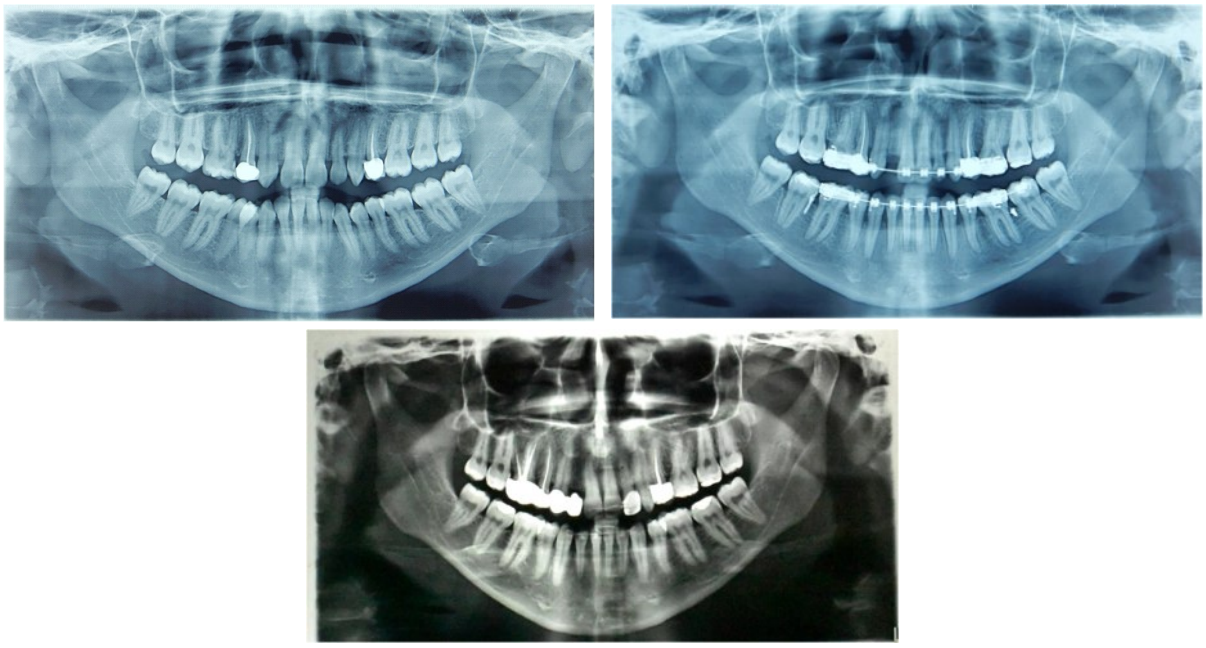

Fig 7. Pre and post treatment orthopantamogram

SKELETAL ANALYSIS	PRE-Tx	POST-Tx	DIFF
SNA	79°	79°	0
SNB	85°	83°	2°
ANB	-6°	-4°	2°
SN-MP	35°	36°	1°
FMA	28°	29°	1°
DENTAL ANALYSIS			
U1-NA	9mm	13mm	4mm
U1-SN	115°	126°	11°
L1-NB	7mm	4mm	3mm
L1-MP	84°	80°	4°
FACIAL ANALYSIS			
E line-UL	-5mm	-3.5mm	1.5mm
E line-LL	+2mm	+1mm	1mm

TABLE. 1: CEPHALOMETRIC SUMMARY

Fig.8 Pre-post superimposition

Clockwise mandibular rotation was noted in the cephalometric superimposition (Fig. 8). Consistent with camouflage treatment, the axial inclination of the maxillary incisors increased and the mandibular incisors decreased.

DISCUSSION

Age is not a contraindication to orthodontic treatment. Orthodontic treatment can actually help rescue and restore a deteriorated dentition[9]. Maintaining good oral hygiene at home and regular scaling are very important during and after the end of an active orthodontic therapy[10] . In this case, we had a class III situation in combination with multiple missing teeth. Treatment plan therefore needs to be finalised keeping in mind all these multiple factors and the subsequent prosthetic rehabilitation. A multidisciplinary approach was therefore needed in this case. The post-treatment cephalogram shows better profile, but the ANB angle is still -4˚. The mandibular plane angle was increased by 1˚.(Tab. 1) Clockwise mandibular rotation was noted in cephalometric superimposition. The upper incisors were slightly proclined. The lower incisors became more retroclined inevitably. (L1-MP : from 84˚ to 80˚) (Tab. 1) The overall superimposition can hardly show the true value of this treatment modality. The photographs (Fig.5) and the corresponding cephalograms (Fig.6) better indicate the significant results acheived. To improve the anterior cross bite, lower premolar extraction plays important role by providing space to retract lower incisors. In this case, we tried to improve the class III relationship by distalizing the mandibular incisors with first premolars extraction. Even with lower first premolar extraction and miniscrew anchorage, upper incisors advancement was still more significant than lower incisors distalization. For adult class III patients

either camouflage orthodontic treatment or a combination of orthodontics and surgery may be planned. Treatment plan depends on the severity of the malocclusion and patient's primary consent.

CONCLUSION

A multidisciplinary approach is mostly necessary for adult patients with complex dental problems. Adult orthodontic treatment can not only improve smile and facial appearance, it can improve the functioning of teeth and boost self-esteem. With the extraction of mandibular 1st premolars and aligning the teeth, the class III malocclusion was corrected. Adequate space was created for prosthetic rehabilitation of upper right lateral incisor which resulted in midline correction and gave pleasing esthetics. To plan appropriate treatment, proper diagnosis and detailed clinical evaluation must be accomplished beforehand.

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