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Post-Surgical TMJ Ankylosis followed by Orthodontic Correction of Class II Div-1 Malocclusion: A Case Report

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ABSTRACT

This case report describe the management of a 17 years old female patient having class II div 1 malocclusion with history of temporomandibular joint surgery. Intraoral examination revealed that patient have proclined maxillary incisors, exaggerated lower curve of spee, and moderate crowding in upper and lower jaw. Other complaints are bite problem, inability to grinding food and unaesthetic smile. After extraction of upper 1st premolars, canine retraction was done which was followed by retraction of severely proclined upper anterior teeth by third order bend in rectangular stainless steel arch wire. For anchorage management TPA, intra oral anchorage with tip back & toe in bends in stainless steel arch wire was satisfactory. Following treatment, marked improvement in patient's smile, facial profile and lip competence were achieved and there was a remarkable increase in the patient's confidence and quality of life.

Key words: TMJ ankylosis, post-surgical orthodontic treatment.

INTRODUCTION

Class II div 1 malocclusion is more prevalent than any type of malocclusion after Class I malocclusion in our country.[1,2] Over the last decade, increasing numbers of adults have become aware of orthodontic treatment and are demanding high quality treatment, in the shortest possible time with increased efficiency and reduced costs.[3] Class II malocclusions can be treated by several means, according to the characteristics associated with the problem, such as antero-posterior discrepancy, age, and patient compliance.[4] Methods include extra-oral appliances, functional appliances and fixed appliances associated with Class II inter-maxillary elastics.[5] On the other hand, correction of Class II malocclusions in non-growing patients usually includes orthognathic surgery or selective removal of permanent teeth, with subsequent dental camouflage to mask the skeletal discrepancy. The indications for extractions in orthodontic practice have historically been controversial.[6-8] Premolars are probably the most commonly extracted teeth for orthodontic purposes as they are conveniently located between the anterior and posterior segments. Variations in extraction sequences including upper and lower first or second premolars have been recommended by different authors for a variety of reasons.[9-14]

For correction of Class II malocclusions in non-growing patients extractions can involve maxillary premolars or 2 maxillary and 2 mandibular premolars.[15-16] It is usually not the skeletal characteristics of a Class II malocclusion that primarily determine whether it should be treated with 2 or 4 premolar extractions but, rather, the dentoalveolar characteristics. The extraction of only 2 maxillary premolars is generally indicated when there is no crowding or cephalometric discrepancy in the mandibular arch.[17-18]

Extraction of 4 premolars is indicated primarily for crowding in the mandibular arch, a cephalometric discrepancy, or a combination of both, in growing patients.[17-19]

Recent studies have shown that patient satisfaction with camouflage treatment is similar to that achieved with surgical mandibular advancement[20] and that treatment with two maxillary premolar extractions gives a better occlusal result than treatment with four premolars extractions.[2]

PRETREATMENT ASSESSMENT

A 17 year old female reported to the Orthodontic Department at Dhaka Dental College & Hospital with multiple complaints- "I am unable to bite properly", "I am unable to close my lips". She gave a history of previous TMJ surgery for ankylosis. Extra oral examination revealed a mesocephalic asymmetrical face, covex profile and recessive chin. Intra oral examination revealed that the patient had a full Class II molar and canine relationship, excessively proclined maxillary incisors with an overjet of 11 mm. Cephalometric examination revealed Class II skeletal relation with severe maxillary incisor proclination with horizontal growth pattern. Although the sagittal jaw discrepancy was severe, the selective extraction of two permanent maxillary first premolar teeth were considered.

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Our treatment objective focused on the chief complaint of the patient, and the treatment plan was based on the specific treatment goals for this individual.

DIAGNOSIS

Skeletal Class II division 1 malocclusion with severe proclination of maxillary incisors, convex profile, steep mandibular plane angle, incompetent lips, increased overjet.

TREATMENT OBJECTIVES

1. Achieve occlusal intercuspation with a Class I canine relationship.
2. Establishment of an ideal overjet & overbite.
3. Correct the antero-posterior dental relationship.
4. Correction of deep overbite.
5. Upper arch contraction.
6. Final settling of the occlusion and arch coordination.

Fig1. Pre-treatment extra-oral & intra-oral photographs

TREATMENT PROGRESS

The maxillary first premolars were extracted. The first molars were banded and the maxillary and mandibular teeth were bonded from 2nd premolar to 2nd premolar with a 0.018 slot standard edge wise brackets. Retractions of upper canines was done in 0.016 inch round stainless steel arch wire with stop loops and tip back and toe-in anchorage bends.

Fig 2: Intra-oral photograph during treatment

Arch contraction and closure of extraction spaces in upper arch was done by rectangular (0.017 X 0.025 inch) Stainless Steel arch wire with proper control of third order bend 'Torque'. Final settling of occlusion was done with proper interdigitation, inclination, angulation, ideal overjet and overbite. Debonding and retention was given by upper modified Hawley's retainer& lower Hawley's retainer. Patient was advised to come for follow up in retention period.

POST TREATMENT ASSESSMENT:

Lip competence and a straight profile were achieved, improving the patient's facial appearance. A functional occlusion with normal overjet and overbite; Class I canine relationship was achieved. Duration of the treatment was 30 months. The patient and her parent were very happy with complete satisfaction. Improvement can be seen from the pre and post treatment extra-oral and intra-oral photographs (fig: 1 & 3) and pre and post treatment cephalometric analysis. (Fig: 4 and table 1)

Fig 3: Post treatment extra-oral & intra-oral photograph.

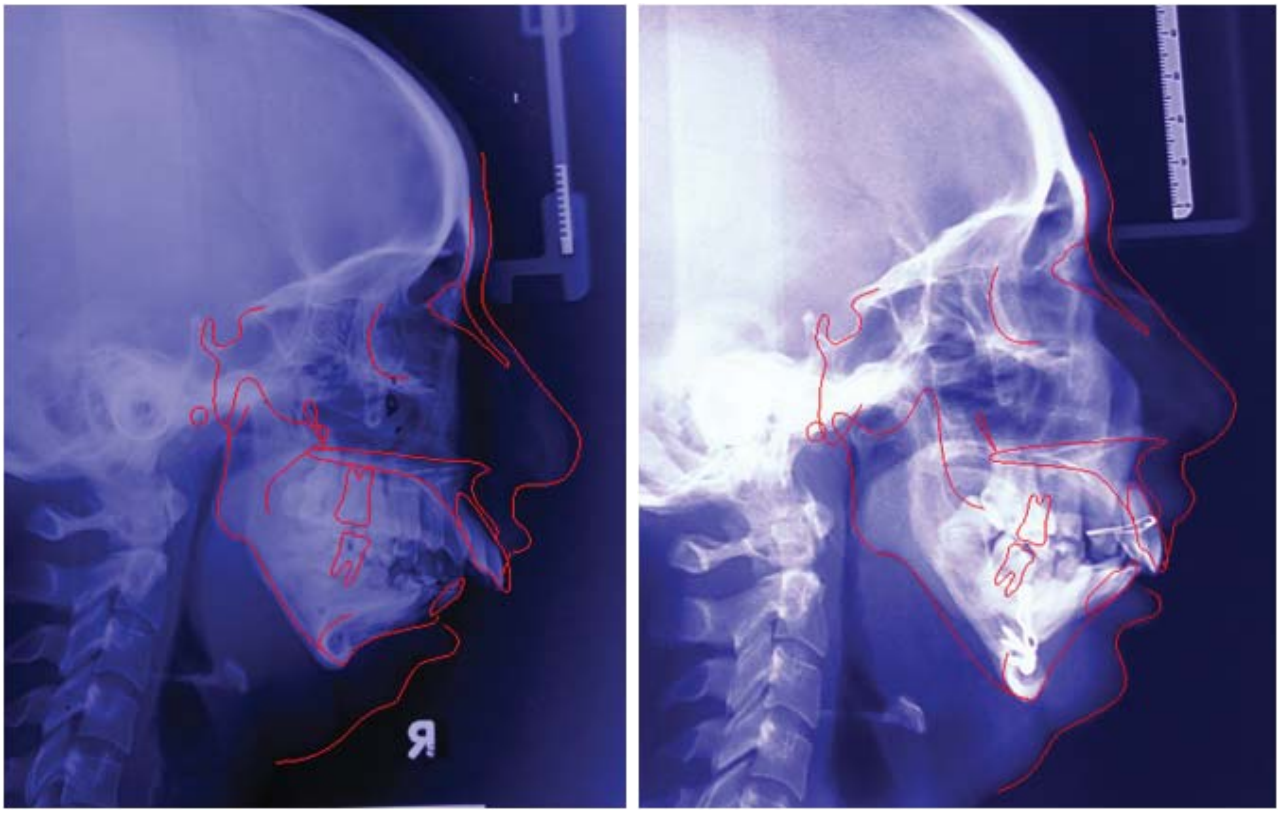

Fig 4: Pre & post treatment cephalometry tracing.

Table: 1 - Pre & post treatment Lateral Cephalogram: Steiner's analysis

Parameters	Reference value (Bangladeshi)	Pt's measurement Pre-treatment	Pt's measurement post-treatment
SNA°	83.8°	81.9⁰	82.2⁰
SNB°	81.5°	68.9⁰	73.2⁰
ANB°	2.3°	13	9⁰
IIA°	117.7°	112.9	115.1⁰
MPA°	25.8°	61.5⁰	51⁰
U1 to NA°	29.8°	11.9⁰	23.7⁰
U1 to NA mm	8mm	3mm	1mm
L1 to NB°	30.6°	12.5⁰	30.5⁰
L1 to NB mm	8mm	3mm	4mm

DISCUSSION

Patient had improved smile and profile after orthodontic treatment. Upper incisors were retracted to achieve normal incisor inclinations, overjet and overbite. Bilateral Class I canine relation was achieved with maximum intercuspation. The case was successfully managed by contemporary orthodontic technique with intra oral anchorage incorporated in arch wire that restored functional and aesthetic demand of the patient.

CONCLUSIONS

Camouflage treatment of Class II malocclusion in adults is challenging. Extractions of premolars if undertaken after a thorough diagnosis leads to positive profile changes and an overall satisfactory facial aesthetics. A well-chosen individualized treatment plan, undertaken with sound biomechanical principles and appropriate control of orthodontic mechanics to execute the plan is the surest way to achieve predictable results with minimal side effects.

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