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Treatment Modalities for Correction of Class III Malocclusion - A Case Report

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ABSTRACT

The treatment of Class III malocclusion is a challenge for the orthodontists. There are 3 different techniques for the correction of Class III malocclusion: Growth modification, Camouflage treatment and Orthognathic surgery. The orthopaedic approach for growth modification is usually limited to the children with growth remaining. Camouflage treatment may be performed in cases with mild skeletal discrepancy by extraction of premolars or by the use of elastics. In case of severe skeletal discrepancy, orthognathic surgery is performed with fixed orthodontics. The following case report discusses about various treatment modalities of Class III malocclusion in a patient with Class III skeletal base.

Keywords: [Class III malocclusion, Camouflage Treatment, Orthognathic surgery, Growth modification, facial esthetics]

INTRODUCTION

Malocclusion can be defined as a deviation from normal occlusion. Skeletal Class III malocclusion cases are complex.[1] Skeletal class III malocclusion is characterized by a prognathic mandible or retrognathic maxilla or a combination of both. The severity of the skeletal discrepancy is the key factor in the treatment planning of such cases.[2] In case of fully grown patients, orthognathic surgery and orthodontic camouflage are the standard modes of treatment. Severe Class III cases can be resolved with orthognathic surgery and it is aimed to correct skeletal and dental discrepancies improving the facial esthetics. Moderate cases can be attempted with extraction treatment.[3] A case of mild skeletal class III with Class I malocclusion and mild crowding can be a borderline case but it requires a meticulous treatment planning.[4] In these cases, the purpose of orthodontic treatment should be to alleviate the crowding and alignment of the dental arches. An attempt to correct the skeletal deformity by extracting mandibular premolars in such cases would further worsen the soft tissue profile.

CASE REPORT

A 16 years old female patient reported with the chief complain of spacing in the upper arch and difficulty in chewing food. She had a symmetrical, meso-facial face and a straight facial profile. She did not have any symptoms of pain, restricted jaw movement, joint noise or other symptoms.

On intraoral examination, it was found that she had anterior cross bites on the maxillary right and left lateral incisors and canines, and posterior cross bites on the maxillary right and left first premolars. She had a 0.5 mm of reverse overjet and 1 mm of over bite of her maxillary central incisors. Angle's Class III molar relation was found on both sides. The maxillary arch showed spacing in the anterior region, and the mandibular arch was devoid of crowding with a flat curve of Spee. Her maxillary dental mid line was coinciding with the

mandibular dental mid line along with her facial mid line.

Figure 1: Pre-Treatment Extra-Oral Photographs

A panoramic radiograph revealed presence of all permanent teeth. Her right maxillary 1st molar was endodontically treated. The lateral cephalometric analysis revealed a skeletal Class III pattern (ANB -1^{o}, Wits appraisal -8mm) with a hypo-divergent growth pattern (SN-MP 38^{0}). The maxillary incisors were proclined (U1- SN 122^{0}) along with the mandibular incisors (IMPA 95^{0}).

Figure 2: Pre-Treatment Intra- Oral Photographs

It was planned to extract the mandibular 1st premolars. Maxillary and mandibular 1st and 2nd molars are to be banded. Pre-adjusted edgewise brackets (22" X 28") will be bonded. After initial levelling and alignment, mandibular anterior segment will be brought back by sliding mechanics. Elastomeric chain will be used in the maxillary arch for the consolidation of the arch if required. Settling will be done followed by removal of the brackets. Fixed retainers will be provided for the retention in both the arches.

DISCUSSION

Class III malocclusion is far more prevalent in Asian countries than in the West.[5]**.** The incidence of anterior cross bite is 2.3-13 % among Japanese, 9.4-19 % among Koreans and 12.8 % among Chinese.[6] Accordingly, class III malocclusions account for a large proportion of orthodontic patients in these countries - for example, 33 % of orthodontic patients in Japan and 20 % in China.[7] In contrast, the prevalence of class III malocclusion in the United States is only about 1.0 % of the total population, and only 5 % of orthodontic patients.[5]

Mild skeletal Class III patients with decent facial profile can be treated with camouflage orthodontic treatment. The point up to which orthodontic treatment is sufficient to camouflage a malocclusion is still debatable. When the skeletal Class III discrepancy is beyond the limit of dental compensation, orthognathic surgery is the only option to create a stable functional occlusion.[8] In this case, nasion was positioned further backwards decreasing the length of the anterior cranial base.[9] The pre-

treatment skeletal discrepancy originated from her mild retropositioned maxilla and prognathic mandible. Pre-treatment record showed dental compensation. The growth period was also over for growth modification in this case.

Stellzig-Eisenhauer et al[10] reported that the Wits appraisal is the most important factor in determining whether the developing Class III malocclusion should be treated by camouflage treatment or surgery. The average Wits appraisal value for patients who were successfully treated with camouflage treatment was -4.6 ± 1.7 mm.[10] In this study, the Wits measurement was -8 mm, significantly higher than the limit suggested by Stellzig- Eisenhauer et al for camouflage treatment. Although surgical intervention was theoretically the appropriate treatment for this patient, the patient declined this option because of the invasive nature of the procedure.

Extraction of mandibular 3rd molars followed by placement of Class III elastics is another option for treating borderline Class III cases. In the case, the patient had a hyper-divergent growth pattern. Use of elastics would cause the extrusion of maxillary molars and mandibular incisors.[11] This would result in further clockwise rotation of the mandible with increase in the anterior facial height.[12]

This patient had a severe Class III malocclusion. The use of Multi-loop Edge-wise Arch-wire (MEAW) technique would not help to establish Class I molar relation. It would rather increase the posterior vertical height. So this treatment modality was ruled out.

As the dental mid lines were co-inciding with each other along with the facial mid line, the extraction of lower incisor was also ruled out. The patient also did not want her anterior tooth to be extracted.

In this patient, the maxillary incisors were proclined compensating the malocclusion. After initial levelling and alignment, the reverse overjet will become eminent. As the extraction of mandibular 1st premolars were planned, the extraction space would help in attainment of positive overjet.

CONCLUSION

The role of orthodontic treatment is to provide functional stability along with improvement of facial esthetics. The success of treatment of Class III malocclusion not only depends on the correction of the skeletal base but also on the improvement of soft tissue profile

Declaration by Authors

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