Correction of a skeletally class III malocclusion in an adult with a combined orthodontic-orthognathic approach

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INTRODUCTION

The Skeletal Class III malocclusion is characterized by mandibular prognathism, maxillary deficiency or both. The effect of environmental factors and oral function on the etiological factors of a Class III malocclusion is not completely understood. However, there is a definite familial and racial tendency to mandibular prognathism. For moderate to severe class III malocclusions in adult, surgical treatment can be the best alternative. Depending on the amount of skeletal discrepancy, surgical correction may consist of mandibular setback, maxillary advancement or a combination of mandibular and maxillary procedures.

DIAGNOSIS AND ETIOLOGY

- A male Saudi 21year's old patient presented to the clinic complaining of " Spacing in the upper arch and large lower jaw". On examination, he had a dolichofacial face type, straight profile, slightly increased lower facial height, normal nasiolabial angel and competent lips.
- He has symmetrical smile with no gingival show and only 50% of the upper incisors shows during full smile with increased upper lip thickness which masks the skeletal class III background.
- He has generalized spacing in the upper by 10 mm, crowding in the lower by 1 mm localized in the anterior area and overjet is (-3 to -4 mm) with overbite 20%.
- He has anterior and bilateral posterior crossbite with dental Class III buccal segment relationship on both sides.
- The depth of the curve of Spee is 1-2 mm, the upper midline is shifted to the right by 2 mm in relation to the facial midline and the lower midline is shifted to the left by 2 mm in relation to the upper midline.
- Missing teeth #16, 26, 28 and badly decayed teeth #35, 36, 46.
- His lateral cephalometric radiograph reveals a Class III skeletal relationship due to deficient maxilla and prognathic mandible, skeletal concave profile, hyperdivergent mandible, slightly increased lower facial height and retroclined lower incisors.
- The cause of this malocclusion was presumed to be hereditary, though no familial history was reported.

TREATMENT OBJECTIVES

The treatment objectives were to correct the skeletal class III relationship via orthognathic surgery to achieve class I buccal segment with normal overjet and overbite.

TREATMENT PLAN AND ALTERNATIVES

The plan was combined surgical and orthodontic treatment which will correct the anteroposterior discrepancy, the anterior and bilateral posterior crossbite and will achieve a balanced face.The alternative plan was surgically assisted rapid palatal expansion aimed for correction of the bilateral crossbite and extraction of one lower incisor which will increase the compensation and correct the anteroposterior discrepancy. The drawbacks of this plan it will not target the chief complaint of the patient which is the large lower jaw. In addition, this treatment modality usually done in mild to moderate cases as the mandibular incisors were not suitable for much distal movement because of the thin symphysis bone that could damage the periodontal tissues and diagnostic wax up should be checked for tooth size discrepancy after lower incisor extraction. For these reasons discussed above this plan was ignored.

TREATMENT PROGRESS

- Refer the patient for restorations of #35, 36, 46 and he came with extracted #36, 46 as the restorative dentist said it's hopeless.
- A preadjusted edgewise appliance (0.018 slot, Roth prescription).
- Decompensation with Leveling and alignment of teeth in their arches.
- Stabilizing U/L 0.017x0.025 St.St. archwire with surgical crimpable hooks.
- Surgical maxillary advancement 4mm and mandibular setback 4mm.
- Coordinate the upper and lower arches.
- Finishing and detailing.
- Retention, upper wraparound with pontic tooth # 26 and lower fixed retainer (3-3), (5-7).
- Referral to Implantologist for replacement the missing teeth #26, 36, 46.

TREATMENT RESULT

A well-aligned dentition and a good facial balance were obtained. Class I relationships were achieved with normal overjet and overbite and correction of the relative crossbite.

CONCLUSION

This case report describes the surgical orthodontic treatment of an adult with severe skeletal and dental class III relationships. The orthognathic treatment was the best option for achieving an acceptable occlusion with good esthetic result. An experienced multidisciplinary team approach ensures a satisfactory outcome.