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Decoding skeletal class II problem with bilateral sagittal split osteotomy and genioplasty – A case report

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ABSTRACT
Class II malocclusion is most common malocclusion encountered in orthodontic practice. Treatment of class II is challenging as various modalities are available and diagnosing the cause plays a important role in treating it. In skeletal class II cases, camouflage treatment or orthognathic surgery is carried out. But a skeletal problem is best treated skeletally that us via surgery. Here's a case reprtof a non growing female with skeletal class II pattern successfully treated by combing orthodontic treatment for decompensation and followed by bilateral sagittal split osteotomy and genioplasty to attain esthetic goals

KEYWORDS: Skeletal Class II, Orthognathic surgery, Genioplasty, Bilateral sagittal split osteotomy

I. INTRODUCTION

Class II malocclusion is one of the most commonly seen malocclusion in orthodontic scenario. Class II malocclusion can be either skeletal, dental or functional. Causes of class II malocclusion can be multifactorial.[1]

Class II cases with antero-posterior discrepancy have an increased ANB, wits appraisal showing a malrelation between the jaws , that is, maxilla and mandible.[1]Skeletaldiscrepancy may cause severe esthetic and functional issues. It can be due to maxillary prognathism or mandibular retrognathism or both. Thus, when a non growing individual presents with a severe skeletal discrepancy, orthodontic and orthognathic approaches are combined to give esthetic harmony, structural balance and functional efficiency,[2,3,4,5,6]Presurgical decompensation is a essential part in any orthognathic case as it helps the surgeon to bring about various movements of the jaw to bring about surgical coorection.[2,3,4]Here's a case report of a patient treated with this combination approach of orthodontic and orthognathic surgery

Casereport

A 23-year-old adult female reported to the department of Orthodontics and Dentofacial Orthopaedics with the chief complaint of forwardly and irregularly placed upper front teeth. Clinical examination revealed convex profile with posterior divergence, mesomorphic facial form, recessive chin, non consonant smile arc, on intraoral examination, the patient presented with Class II canine relation and incisor relationship,upper and lower anterior crowding, retroclined 11, missing lower right first molar, increased overjet of 8mm and increased overbite.(Figure 1). Cephalometric analysis (Table 1) revealed a convex skeletal profile with ANB angle of 8°, a severely retruded mandible, a well-positioned maxilla,incresed mandibular plane angle suggestive of Vertical growth pattern.

Diagnosis was Skeletal Class II with vertical growing pattern underlying British incisorclass II malocclusion with crowding in upper and lower anteriors

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Figure 1- Pre treatment Photographs

Treatment Objectives

1. Correction of reduced mandibular length
2. Correction proclined upper anteriors
3. Correction of crowding in upper and lower anteriors
4. Correction of palatally tipped 11
5. Correction of canine relation
6. Attaining pleasing soft tissue profile

Treatment Plan

Treatment plan was devised which included surgical advancement of mandible for correction of Skeletal Class IImalocclusion. Orthognathic surgery procedure included decompensation followed by bilateral sagittal split osteotomy and genioplasty as she had a recessive chin.

Figure 2- Photographs after correction of lingually blocked out 11

Treatment Progress

Initially leveling and aligning was done with 0.014", 0.016", 0.017x0.025" , 0.019x0.025" CuNiti . Lingually tipped upper incisor was corrected and the hindrance for mandibular advancement was removed(Figure 2)

Figure 3- Intraoral photograph after correction of curve of spee and mesialization of 47

After leveling and aligning, 0.019x0.025"SS was placed with reverse curve of spee and lower and exagerrated curve of spee in upper arch. First molar space was replaced by mesialization of second molar in lower right quadrant.(Figure 3)

Figure 4 depicts the occlusion after decompensation and then later facebow transfer was carried out in the patient and surgical splint was made as shown in figure 5.

Figure 4- Pre- surgical Orthodontics Photographs

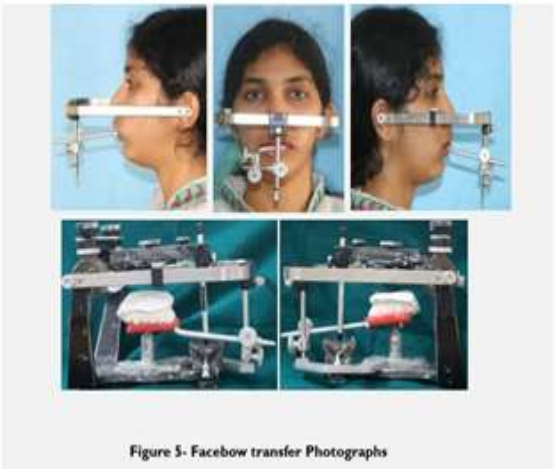

Figure 5- Facebow transfer Photographs

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After presurgicalorthodontics, patient was posted for orthognathic surgery. Bilateral sagittal split osteotomy(BSSO) and genioplasty was performed as shown in figure 6. Mandible was adbanced by 6mm and genioplasty was done to improve chin contour.

Figure 6- Surgery photographs

After surgery, settling elastics were placed in the posterior for settling the bite as shown in figure 7

Figure 7 – Bite settling elastics

TREATMENT RESULTS

At the end of treatment a major improvement was seen in the facial balance and esthetics along with a straight profile. A Class I molar and canine relationship was also achieved bilaterally with a good buccal inter-digitation and a reduction in the increased overjet and overbite to 2mm and 2.5mm respectively as in figure 8. Post treatment cephalometric readings suggested decrease in ANB angle and increased mandibular length along with forward position of mandible as shown in table 1. Hawley's appliance was given for retention in upper and lower arch.

Figure 8- Post surgical photographs

Table 1- cephalometric values

Parameter	Mean value	Pre Rx	Post Rx
SNA	82	80	80
Eff. Max.length	93.6± 3.2mm	92	91
SNB	79± 2.8°	73°	78
Eff.mand length	121.6±4 .5mm	107	117
ANB Beta angle	2	7° 21°	2 34
FMA	24.57	38°	37
SN-GO-GN	32	34°	37
Y AXIS	59.54	63°	70
Upp. inc to NA angle	22°	30°	29
Upp. Inc to NA linear	4mm	4	8
Low inci.to NB angle	25	19°	28
Low.inci to NB linear	4	5	7
Low.inc.to mand.plane	1.4	-11°	-3

II. DISCUSSION

Class II malocclusion is a great challenge to treat by an orthodontist as it is commonly seen in orthodontic practice. Skeletal discrepancy is treated according to severity. In growing patients, skeletal discrepancy is treated with either Myofunctional , orthopaedic appliance or fixed orthodontic appliance. Whereas in patient with no active growth left, dental malocclusion is treated with camouflage whereas severe skeletal issue is treated with orthognathic surgery.1As our patient had severe skeletal discrepancy, we went ahead with combination approach of orthodontic treatment for decompensation and orthognathic surgery.

The surgical correction of such severe dentofacial deformities is a functional and esthetic surgery that affects patients' self-perception. The patient appreciated the improvement in his facial appearance after orthognathic surgery that was associated with a noted improvement in his psychosocial adjustments.8

Orthognathic surgery can also be performed with surgery first . Contraindications for surgery first approach include patients that needs definite decompression, patients with severe crowding, arch incoordination and patients with severe vertical or transverse discrepancies [7].but in this case it was contraindicated due to lingually placed incisor which was hindering the mandible and also the curve of spee present in lower arch.

During treatment, SNA value remained unchanged while the SNB value increased by 5°. As a result, the ANB value decreased from 7° to 2° which is Class I skeletal pattern. The upper incisor proclination was reduced, and lower incisor proclination was increased. The vertical mandibular proportions also increased during treatment (Table 1).

On comparing the cephalometric pre- and post-treatment findings, a notable improvement was seen in both the soft tissue and facial profile. A considerable improvement in the soft tissue was also appreciated with a shift towards an orthognathic profile. The upper lip relation to E line improved . The treatment could thus accomplish a well-balanced face with a pleasant smile. The results were stable and extremely satisfying for both the clinician as well as the patient.

III. CONCLUSION

Orthognathic surgery is one of the best methods to treat skeletal discrepancy for improving function and esthetics. It also ensures excellent long tern stability. Orthodontists should be aware of the potential limitation of incomplete maxillary and mandibular incisor decompensation on skeletal outcomes.

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