

## Orthodontic And Surgical Correction of Class-III Malocclusion With Excellence Facial Aesthetic Results- Case Report.

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**Abstract :** In skeletal Class III cases, it may be difficult to achieve an excellent occlusal outcome only with orthodontic treatment and to maintain a stable posttreatment occlusion. There are three main treatment options for skeletal Class III malocclusion: growth modification, dentoalveolar compensation, and orthognathic surgery. Growth modification should be initiated before the pubertal growth spurt; afterwards, only two options are possible.<sup>12</sup> Thus, treatment of skeletal Class III malocclusion in an adult requires orthognathic surgery combined with conventional orthodontic treatment aiming to improve self-esteem and achieve normal occlusion and improvement of facial esthetics. There is little doubt that to achieve excellent treatment results in adult patient with multiple skeletal and dental problems require multidisciplinary approach. Orthodontist plays key role in coordinating orthodontic treatment with other treatment performed by specialist.

**Keywords:** Class III malocclusion, Facial Aesthetics, Mandibular Prognathism, Orthognathic Surgery

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### I. Introduction

Dr. Angle had developed a simple form of classification for sagittal discrepancy more than a century ago, yet this classification is still based of other more descriptive form of classification in recent time. According to Dr. Angle, Class III malocclusion can be defined as A malocclusion where the molar relationship shows the mesiobuccal groove of the mandibular first molar mesially positioned to the mesiobuccal cusp of the maxillary first molar when the teeth are in occlusion.<sup>1,2</sup> Nevertheless, as with all Angle's classification of malocclusion, class III malocclusion comprises several skeletal and dental components that may differ from the concept of normality. For example, it can be characterized by presenting a mandibular skeletal protrusion (mandibular prognathism), a maxillary skeletal retrusion, a combination of both, or no anteroposterior skeletal imbalances. Number of studies have been conducted to find out prevalence of Class III malocclusion. However, they are varied in terms of geographic locations as well as ethnic origin. According to systemic review and meta-analysis conducted by Daniel K. at al.<sup>3</sup> average prevalence of class III malocclusion is 7.04% with range from 0 to 26.67%. Populations from Southeast Asian countries showed the highest Angle class III malocclusion prevalence rate of 15.80%.<sup>4-8</sup> The European studies had an average prevalence rate of 4.88%, whereas Indian populations had the lowest prevalence rate of 1.19 %.<sup>7-9</sup>

White Americans showing 1% prevalence class III as compared to African-Americans who are showing upto 3%.<sup>10</sup> In skeletal Class III cases, it may be difficult to achieve an excellent occlusal outcome only with orthodontic treatment and to maintain a stable posttreatment occlusion.<sup>11</sup> There are three main treatment options for skeletal Class III malocclusion: growth modification, dentoalveolar compensation, and orthognathic surgery. Growth modification should be initiated before the pubertal growth spurt; afterwards, only two options are possible.<sup>12</sup> Thus, treatment of skeletal Class III malocclusion in an adult requires orthognathic surgery combined with conventional orthodontic treatment aiming to improve self-esteem and achieve normal occlusion and improvement of facial esthetics.<sup>13,14</sup> Proffit et al.<sup>15</sup> found that psychological rather than morphologic characteristics probably were the major reason on whether or not an individual decided to accept surgery. Bell et al.<sup>16</sup> also pointed out that the decision of surgery was mainly related to patients' self-perception. Surgical treatment of Class III malocclusion includes, in most cases, mandibular retrusion, maxillary protrusion, or a combination of both. And It is important to predict soft tissue changes that can occur with maxillary advancement surgery.

Misdiagnosis of soft tissue responses with maxillary advancement surgery can result in undesirable esthetic outcome.<sup>17</sup>

Here, we are presenting a case of class III malocclusion treated by combination of orthodontics and surgical orthognathic approach to get excellent results.

## **II. Etiology And Diagnosis**

A 18 year old female patient came to our clinic with the chief complain of irregularly placed upper front teeth. On extraoral examination patient was having mesoprosopic facial type with competent lips and non-consonant smile arc. Patient was having a concave soft tissue profile. Intraoral examination was showing class III molar relation bilaterally. Along with class III molar relation, upper anteriors were in crossbite. Overbite was -1mm, reverse overjet was 2.5mm. Furthermore, lower incisors were upright. All these features were suggesting a typical case of class III malocclusion. Our diagnosis was Angle's class III molar relation superimposed over skeletal class III base relation due to retrognathic maxilla and prognathic mandible with horizontal growth pattern, crossbite in relation to upper incisors and palatally displaced lateral incisors along with concave soft tissue profile and non-consonant smile arc. (Fig. 1-4)

## **III. Treatment Planning**

One based of our diagnosis and cephalometric data, decision was made to proceed with fixed orthodontic appliance followed by orthognathic surgery (maxillary advancement and mandibular setback). Patient will have 6 months of post-surgical orthodontic treatment. Treatment started with MBT 0.022'' bracket system by upper and lower full arch bonding and banding on molars. Initial alignment and leveling was started with round 0.014'' Niti in upper and lower arches for first visit. 0.014'' wires were subsequently replaced with 0.016'' and then 0.018'' Niti wires in next 2 months. Later on, first rectangular wires have been place which were 0.017''x0.025'' Niti followed by 0.019''x0.025'' Niti and lastly with 0.019''x0.025'' Stainless steel wires. Progress cephalometric radiograph was taken at regular interval to evaluate patient's growth and incisor position. Case was reevaluated mid-treatment for possibility of extraction and to decompensate upper and lower dentition for surgical procedure.

Treatment proceeded non-extraction due to patient's concave profile. (Fig. 5, 6)At this point of time patient was ready to be sent for Orthognathic surgery. We had planned maxillary advancement and mandibular setback for excellent facial esthetic. (Fig.7, 8)There were another 6 months for post surgical orthodontics for finishing and detailing.

## **IV. Results**

Due to well-planned orthodontic treatment and combined orthodontic treatment with orthognathic surgical procedure, excellent functional and esthetic results were obtained. Post treatment orthodontic records shows dramatic improvement in facial esthetics primarily due to advancement of maxilla and retraction of mandible. Facial profile pictures show that patient now has orthognathic profile with improvement in upper lip position and reduction in chin protrusion. Post treatment intraoral pictures and casts demonstrate good interdigitation of teeth, improvement in negative overjet and also overbite. In accumulation to angles class-I molar occlusion, acceptable interincisal relationship had been established. (Fig. 9-13)They cephalometric evaluation showed significant changes to the patient measurement.

The ANB angle increase from  $-3.5^{\circ}$  to  $1.4^{\circ}$ . Facial pattern measurement changed significantly, upper lip to E-plane improved from -9.0 to -4.0 mm and lower lip to E-Plane improved from -0.2 to -5.1 that proved retraction of lower lip and protraction of upper lip. (Fig.3, 10) As stated by Nagoriet at., there was no significant change noted in patients Nasolabial angle.<sup>17</sup>At follow-up appointment our patient's maxilla and mandible was stable and post treatment skeletal values did not change. Patient reported minor incisor rotation in the upper arch at 6 month follow-up appointment due to noncompliance with upper essix retainer.

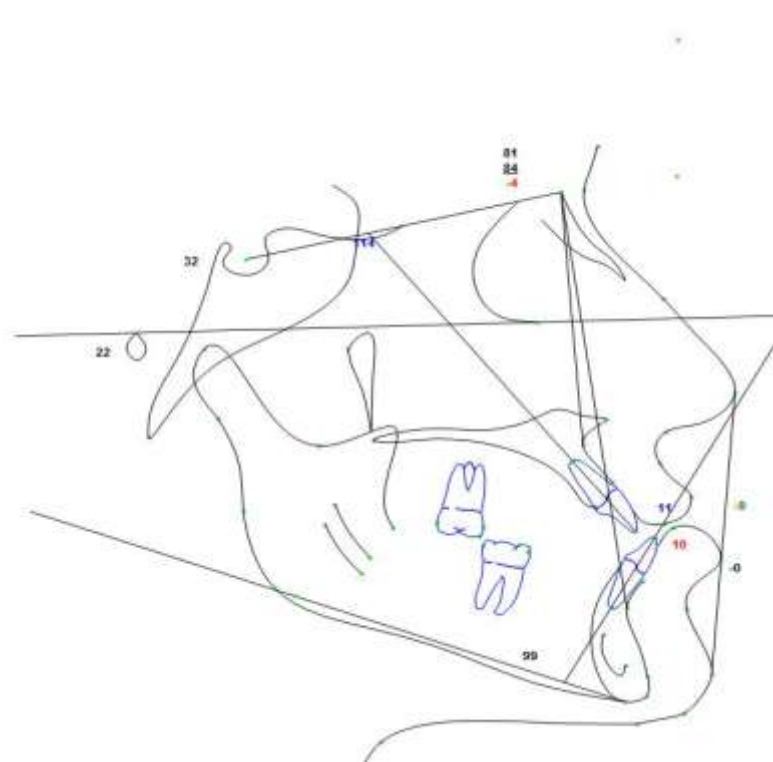
**V. Figures And Tables**



**Fig. 1.** Pretreatment photographs.



**Fig. 2.** Pretreatment radiographs.



**Fig. 3.** Pretreatment tracing

<b>Maxilla to Cranial Base</b>				
SNA (°)	80.7	82.0	3.5	-0.4
<b>Mandible to Cranial Base</b>				
SNB (°)	84.2	80.9	3.4	1.0 *
SN - MP (°)	31.7	32.9	5.2	-0.2
FMA (MP-FH) (°)	21.8	23.9	4.5	-0.5
<b>Maxillo-Mandibular</b>				
ANB (°)	-3.5	1.6	1.5	-3.4 ***
<b>Maxillary Dentition</b>				
U1 - NA (mm)	11.5	4.3	2.7	2.7 **
U1 - SN (°)	114.4	102.8	5.5	2.1 **
<b>Mandibular Dentition</b>				
L1 - NB (mm)	9.9	4.0	1.8	3.3 ***
L1 - MP (°)	98.5	95.0	7.0	0.5
<b>Soft Tissue</b>				
Lower Lip to E-Plane (mm)	-0.2	-2.0	2.0	0.9
Upper Lip to E-Plane (mm)	-9.0	-6.0	2.0	-1.5 *

**Fig. 4.** Pretreatment Cephalometric readings.



Fig. 5. Pre-Surgical Photographs.



Fig. 6. Pre-Surgical Cephalogram



Fig. 7. Post Surgical photographs.



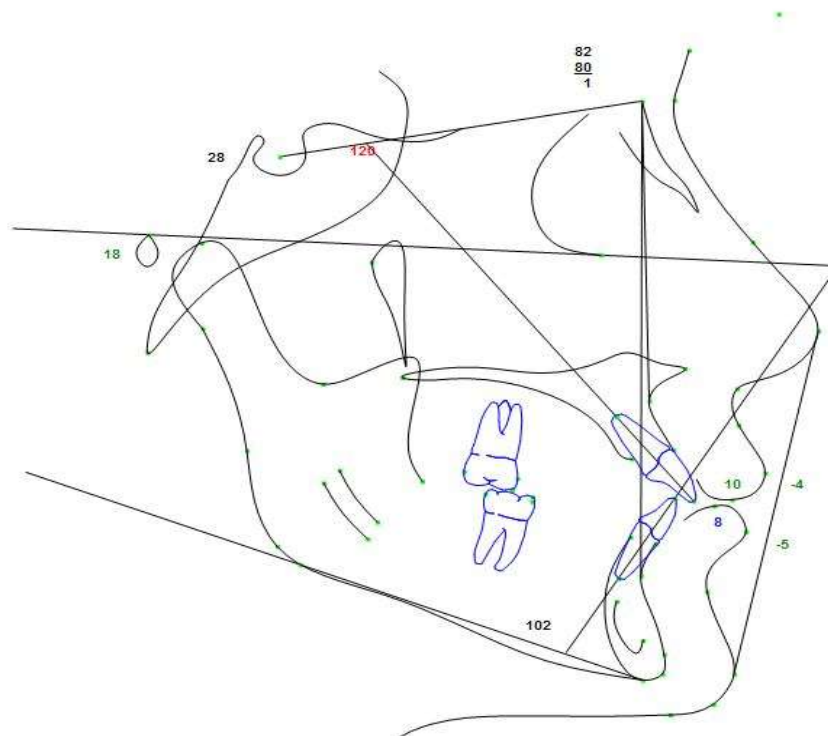
Fig. 8. Post Surgical radiographs.



**Fig. 9.** Post Debonded Photographs.



**Fig. 10.** Post debonded Radiographs.

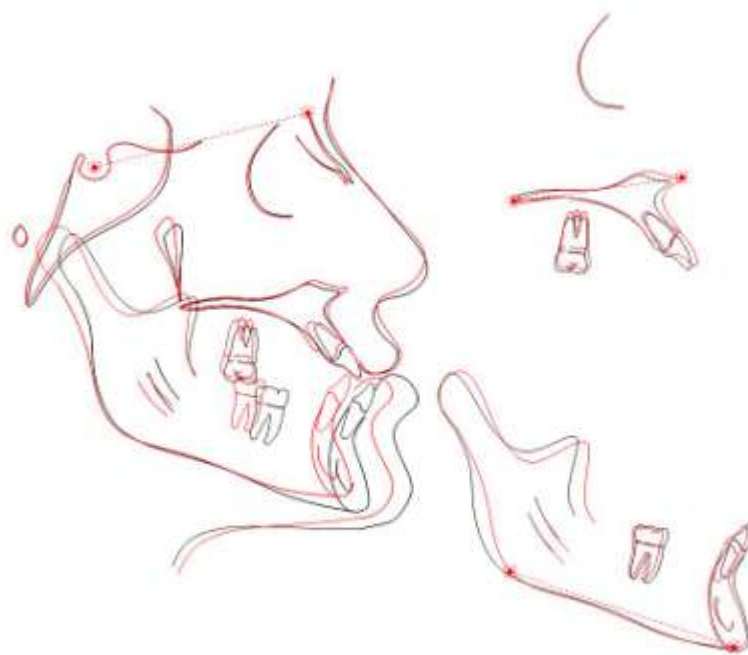


**Fig. 11.** Post Debonded Cephalometric tracing

<b>Maxilla to Cranial Base</b>				
SNA (°)	81.6	82.0	3.5	-0.1
<b>Mandible to Cranial Base</b>				
SNB (°)	80.2	80.9	3.4	-0.2
SN - MP (°)	28.2	32.9	5.2	-0.9
FMA (MP-FH) (°)	17.6	23.9	4.5	-1.4 *
<b>Maxillo-Mandibular</b>				
ANB (°)	1.4	1.6	1.5	-0.2
<b>Maxillary Dentition</b>				
U1 - NA (mm)	9.5	4.3	2.7	1.9 *
U1 - SN (°)	119.9	102.8	5.5	3.1 ***
<b>Mandibular Dentition</b>				
L1 - NB (mm)	7.6	4.0	1.8	2.0 **
L1 - MP (°)	101.9	95.0	7.0	1.0 *
<b>Soft Tissue</b>				
Lower Lip to E-Plane (mm)	-5.1	-2.0	2.0	-1.5 *
Upper Lip to E-Plane (mm)	-4.0	-6.0	2.0	1.0 *

**Fig. 12.** Post Debonded Cephalometric readings.





**Fig. 13.** Superimposition

## VI. Conclusion

In Summary, The Treatment Of Dentofacial Deformities Of Young patients that finished craniofacial growth is complex, especially when transversal and sagittal discrepancies exist, it requires orthodontic treatment combined with orthognathic surgery to achieve stable, functional, and esthetic results. Treatment of class-III skeletal malocclusion is considered very difficult and careful detail examination of patient is important. However, an orthodontic-surgical approach for the correction of this alteration has wide acceptance among patients. Orthodontic camouflage of this malocclusion requires a detailed assessment of patient's face. When esthetics is compromised, only an orthodontic treatment is not enough. In these cases, it is necessary to combine orthodontics and orthognathic surgery to meet the patient's complaints and provide better functional and esthetic results. There is little doubt that to achieve excellent treatment results in adult patient with multiple skeletal and dental problems require multidisciplinary approach. Orthodontist plays key role in coordinating orthodontic treatment with other treatment performed by specialist.

## References

- [1]. Proffit, W.R., Fields, H.W. and Sarver, D.M. (2007) Contemporary orthodontics. Mosby, St. Louis.
- [2]. Angle, E.H. (1899) Classification of malocclusion. *Den- tal Cosmos*, **41**, 248-264.
- [3]. Hardy D, Cubas Y and Orellana, M. Prevalence of angle class III malocclusion: A systematic review and meta-analysis. *O J Epi* 2012;2:75-82.
- [4]. Lew, K.K., Foong, W.C. and Loh, E. Malocclusion prevalence in an ethnic Chinese population. *Aus Dent J* 1993;38:442-449.
- [5]. Tang, E.L. Occlusal features of Chinese adults in Hong Kong. *AusOrthod J* 1994;13:159-163.
- [6]. Tang, E.L. The prevalence of malocclusion amongst Hong Kong male dental students. *Bri J Orthod* 1994;21:57-63.
- [7]. Woon, K.C., Thong, Y.L. and Abdul Kadir, R. Permanent dentition occlusion in Chinese, Indian and Malay groups in Malaysia. *AusOrthod J* 1989;11:45-48.
- [8]. Soh, J., Sandham, A. and Chan, Y.H. Occlusal status in Asian male adults: Prevalence and ethnic varia- tion. *Angle Orthod* 2005;75:814-820.
- [9]. Gauba, K., Ashima, G., Tewari, A. and Utreja, A. Prevalence of malocclusion and abnormal oral habits in North Indian rural children. *J IndSoc Ped and Prev Dent*. 1998;16:26-30.
- [10]. Emrich R, Brodie A., Blayney J. Prevalence of class I, class II, and class III malocclusions (angle) in an urban population an epidemiological study. *J Dent Res*1965 44: 947.
- [11]. E. Kondo and T. J. Aoba, "Nonsurgical and nonextraction treatment of skeletal Class III open bite: its long-term stability," *The American Journal of Orthodontics and Dentofacial Orthopedics*, vol. 117, no. 3, pp. 267-287, 2000.
- [12]. A. B. Rabie, R. W. Wong, and G. U. Min, "Treatment in borderline class III malocclusion: orthodontic camouflage (extraction) versus orthognathic surgery," *The Open Dentistry Journal*, vol. 2, pp. 38-48, 2008.

- [13]. G. W. Arnett and R. T. Bergman, "Facial keys to orthodontic diagnosis and treatment planning. Part I," American Journal of Orthodontics and Dentofacial Orthopedics, vol. 103, no. 4, pp. 299–312, 1993.
- [14]. G. W. Arnett and R. T. Bergman, "Facial keys to orthodontic diagnosis and treatment planning—part II," American Journal of Orthodontics and Dentofacial Orthopedics, vol. 103, no. 5, pp. 395–411, 1993.
- [15]. W. R. Proffit, C. Phillips, and C. T. Dann, "Who seeks surgical-orthodontic treatment?" The International Journal of Adult Orthodontics and Orthognathic Surgery, vol. 5, no. 3, pp. 153–160, 1990.
- [16]. R. Bell, H. A. Kiyak, D. R. Joondeph, R. W. McNeill, and T. R. Wallen, "Perceptions of facial profile and their influence on the decision to undergo orthognathic surgery," American Journal of Orthodontics, vol. 88, no. 4, pp. 323–332, 1985.
- [17]. Nagori H., Fattahi T. Maxillary Advancement Surgery and Nasolabial Soft Tissue Changes. IOSR J Dent and Med Sci 2017: 3: 23-29.

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