Research Article

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Outcome of Orthognathic Surgery in Class III Malocclusion Patients

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ABSTRACT

Background: The present study was conducted to assess outcome of orthognathic surgery in class III malocclusion patients.

Materials & Methods: 64 patients of class II malocclusion underwent 1-stage maxillary and mandibular orthognathic surgery with clockwise rotation, without 2-piece segmental surgery; and 2-stage maxillary and mandibular orthognathic surgery. In all patients, the lateral cephalograms were taken.

Results: SNA was 82.8 and 82.3 degree before treatment, and after treatment respectively, SNB was 80.4 and 77.1 degrees before treatment, and after treatment, ANB was 2.5 and 4.2 degrees before treatment and after treatment, Go- Me (mm) was 79.2 and 82.1 before treatment and after treatment, U1- SN was 108.3 and 96.3 degrees before treatment, and after treatment, L1- GoGn was 70.5 and 78.2 degrees before treatment, and after treatment, upper lip- E line (mm) was 1.2 and 0.4 before treatment and after treatment and lower lip- E line (mm) was 4.5 and 2.5 before treatment and after treatment respectively. The difference was significant (P< 0.05).

Conclusion: There was an improvement of dental, skeletal as well as soft tissue factors after orthognathic surgery in class II malocclusion patients.

Keywords: Class II malocclusion, Mandibular prognathism, Orthognathic surgery.

INTRODUCTION

A combination of orthodontic treatment and orthognathic surgery is often used for adult patients with excessive anteroposterior skeletal Class III discrepancies.[1] Several methods have been described for the surgical correction of mandibular prognathism. However, there are some limitations of orthognathic surgery for Class III malocclusions related to the possibility of post-surgical relapse.[2]

Common factors accounting for surgical relapse are the amount of mandibular setback and stretching of the pterygomasseteric sling, which is related to the forward muscular pull. In addition, a large amount of mandibular setback might lead to pharyngeal airway narrowing, causing obstructive sleep-related breathing disorders.[3] To reduce a large amount of mandibular setback when correcting a severe anteroposterior skeletal discrepancy, a mandibular step osteotomy is often used in combination with a 2-jaw surgery. A mandibular step osteotomy reduces the mandibular body length and a large overjet by the closure of bilateral preexisting

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edentulous spaces or by extraction of 2 teeth; in addition, it might correct crossbites in the buccal segments by tilting the posterior fragment lingually.[4]

Orthognathic surgery for mandibular prognathism produces changes in the skeletal and soft tissues in the maxillofacial region, including the positions of the tongue and the hyoid bone, and the consequent narrowing of the pharyngeal airway space.[5] The present study was conducted to assess the outcome of orthognathic surgery in class III malocclusion patients.

MATERIALS & METHODS

The present study was conducted in the department of Orthodontics. It comprised of 64 patients of class II malocclusion of both genders. Ethical clearance was obtained before starting the study. All patients were informed regarding the study, and consent was obtained.

Data such as name, age, gender etc. was recorded. Patients underwent 1-stage maxillary and mandibular orthognathic surgery with clockwise rotation, without 2-piece segmental surgery; and 2-stage maxillary and mandibular orthognathic surgery: phase 1 surgery would include the mandibular step osteotomy with the extraction of the first 2 premolars, and phase 2 surgery would include maxillary and mandibular orthognathic surgery with clockwise rotation and 2-piece maxillary segmental surgery. In all patients, the lateral cephalograms were taken. Linear, proportional and angular measurements were recorded before and after treatment. Results were tabulated and subjected to statistical analysis. P-value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of patients.

Total- 64		
Gender	Males	Females
Number	20	44

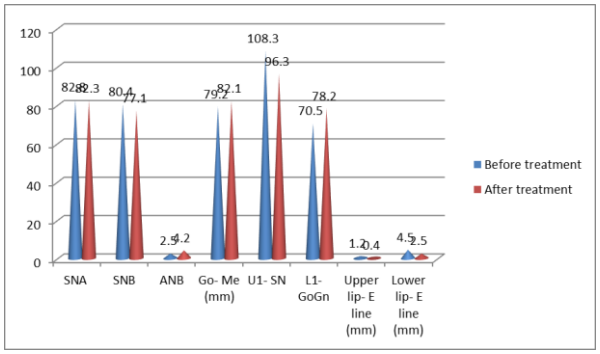
Table I shows that out of 64 patients, there were 20 males and 44 females.

Table II: Assessment of parameters before and after treatment.

Variables	Before treatment	After treatment	P value
SNA	82.8	82.3	0.17
SNB	80.4	77.1	0.05
ANB	2.5	4.2	0.03
Go- Me (mm)	79.2	82.1	0.01
U1- SN	108.3	96.3	0.02
L1- GoGn	70.5	78.2	0.03
Upper lip- E line (mm)	1.2	0.4	0.02
Lower lip- E line (mm)	4.5	2.5	0.01

Table II, the graph I shows that SNA was 82.8 and 82.3 degree before treatment
after treatment, L1- GoGn was 70.5 and 78.2 degrees before treatment, and after treatment, upper lip- E line (mm) was 1.2 and 0.4 before treatment and after treatment and lower lip- E line (mm) was 4.5 and 2.5 before treatment and after treatment respectively. The difference was significant (P< 0.05).

Graph I: Assessment of parameters before and after treatment.



DISCUSSION

Optimal treatment of a Class III malocclusion with skeletal disharmony requires orthognathic surgery complemented by orthodontics.[6] Treating such cases becomes much more challenging when the patient rejects surgery due to fear, cost, or esthetic concerns, but continues to expect a good result.[7] Several treatment options have been proposed for these types of cases, including extraction (usual premolars in the lower or both arches), extraoral traction (horizontal traction of the mandibular arch, or vertical traction in an open-bite case), and

distalization of lower molars with devices such as lip bumpers. The use of an expansion device following a midline maxillary osteotomy has been advocated for treatment of the crossbite that is commonly found in non-growing Class III patients.[8] The present study was conducted to assess the outcome of orthognathic surgery in class III malocclusion patients.

In the present study, out of 64 patients, there were 20 males and 44 females. Choi et al. [9] found that the post-treatment photographs showed that facial symmetry was achieved and an ideal occlusion was established with proper overjet and overbite. The maxillary dental midline coincided with the facial and mandibular midlines. Superimposition of the cephalometric tracings showed that the posterior maxillary teeth were impacted and the mandible had been rotated clockwise and set back. The cephalometric changes included an increase in the ANB angle. The mandibular incisor to mandibular plane angle increased from 70.1 to 78 degree. The mandibular body length decreased from 95.0 to 82.7 mm. The maxillary incisor exposure was increased at rest. Angle Class I canine and Class III molar relationships were established. At 1 year after debonding, the results were stable, and the patient was satisfied with his facial esthetics.

We found that SNA was 82.8 and 82.3 degree before treatment and after treatment respectively, SNB was 80.4 and 77.1 degrees before treatment, and after treatment, ANB was 2.5 and 4.2 degrees before treatment and after treatment, Go- Me (mm) was 79.2 and 82.1 before treatment and after treatment, U1- SN was 108.3 and 96.3 degrees before treatment, and after treatment, L1- GoGn was 70.5 and 78.2 degrees before treatment and after treatment, upper lip- E line (mm) was 1.2 and 0.4 before treatment and after treatment and lower lip- E line (mm) was 4.5 and 2.5 before treatment and after treatment respectively. Distalization is not the only effect of the Carriere Class III Motion Appliance, which is why it is not referred to as a distalizer. Clinical experience with the device has demonstrated skeletal and dental changes, alterations of the occlusal plane and the intermaxillary relationship, and improvement of soft-tissue prognathic conditions.[10]

Skeletally, the appliance fosters a functional repositioning of the condyle in the temporomandibular complex, as a consequence of lower-molar intrusion and lower-canine extrusion, the mandible repostures along the occlusal plane. This phenomenon has consistently resulted in a counterclockwise rotation of the posterior occlusal plane - a direct effect of the appliance. Combined with distalization of the posterior mandibular dental segments, retraction of the lower incisors, and a slight advancement of the upper incisors, it produces a marked improvement in a prognathic profile.[11]

The retropositioning of the mandible and counterclockwise rotation of the mandibular plane results in a shortening of the musculature involved in the floor of the mouth, including the genioglossus, geniohyoid, mylohyoid, and digastric muscles. As these muscles become more relaxed, they create a larger space for the base of the tongue in the posterior third of the pharyngeal cavity, which is a naturally comfortable and more functional zone. The anterior pressure of the tip of the tongue against the lower incisors is thereby reduced, resulting in an improvement of the facial profile.[12]

CONCLUSION

Authors found that there was an improvement of dental, skeletal as well as soft tissue factors after orthognathic surgery in class II malocclusion patients.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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