

Treatment of skeletal class III malocclusions with a combination of orthodontic treatment and orthognathic surgery

Eddy H. Habar,^{*1} Muhammad Ruslin²

Abstract

Objective: This article discusses a case reports of skeletal class III malocclusions treated with fixed orthodontic appliances and orthognathic surgery.

Methods: Female patients aged 16 with complaints of crossbite in the anterior region and facial aesthetics. The objective examination showed ectostem teeth at 13, peg shaped teeth at 12, agenesi at 22 and

diastema in teeth 34-35. The mandible looks forward.

Results: Orthodontic treatment with fixed orthodontic appliances to straighten teeth in the dental arch then orthognathic surgery was performed to correct advanced of mandibular jaw.

Conclusion: Maximum results are obtained by interdisciplinary treatment between orthodontist and oral surgeon.

Keywords: Class III, Orthodontic treatment, Orthognathic surgery

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¹Department of Orthodontic, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia

²Department of Oral and Maxillo-facial Surgery, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia

Introduction

Skeletal Class III malocclusion are complex skeletal relationships that have abnormalities and are difficult to correct. The incidence of this malocclusion in the caucasoid race is around 5 percent. Etiology is generally influenced by genetic factors. Treatment made to improve function and aesthetics. This requires a combination of orthodontic treatment and orthognathic surgery.^{1,3}

Patients with skeletal class III malocclusion usually show abnormalities in the jaw relationship and the teeth interdigitation. Common cephalometric values include short anterior cranium base length, small SNA angle, inclination of the anterior maxilla incisor teeth, inclination of anterior mandible incisor teeth, and 1/3 length of the lower face. The anterior tooth relation has a crossbite. Variations in skeletal class III malocclusion abnormalities can be as a retrusive maxilla, prognathism of mandible or both (combination). There is a pattern where the mandibular rotation is towards the back and overgrowth in the vertical direction (Long Face Syndrome).^{2,4}

In the case of skeletal class III malocclusion, good care planning is needed. Integrated treatment involving various fields of science and specialization as well as collaboration with patients is the key to successful care. Patients usually complain of discomfort in terms of appearance, but usually also followed by disruption of chewing and speech functions and disorders of the temporo mandibular joints.^{3,6}

The purpose of this paper is to describe the treatment of patients with skeletal class III malocclusion in combination with orthognathic surgery treatment.

Case Report

A 16-year-old female patient presents with complaints of anterior crossbite and facial aesthetic appearance which greatly disrupts self-confidence. The patient wants to improve the relation of his front teeth and improve the aesthetic appearance of his face [figure 1](#).

On extra oral examination found concave face profile form. From the lateral aspect, the lower lip appears more advanced than the upper lip. On intra oral examination [figure 2](#), the maxillary teeth 13 appear which are ectostem, tooth 12 which is peg shaped, tooth 22 which is agenesi. In the lower jaw there are rotations in teeth 32, 32, 41 and 42 and diastema between teeth 34-35. The maxillary median line shifts to the right. Moderate patient oral hygiene.

From cephalometry analysis it is known that SNA = 79, SNB = 82, ANB = -3 and mandibular length = 106mm. On functional examination there are no abnormalities. Normal TMJ has no clicking or pain. Analysis of the study model shows the relationship of left and right molar are mesiocclusion. Negative open bite, negative overjet distance. The median line shifts to the right by 2 mm [figure 3](#).

*Correspondence to:
eddyorto@gmail.com



Figure 1 Profile photo before treatment



Figure 2 Intra oral photographs before treatment

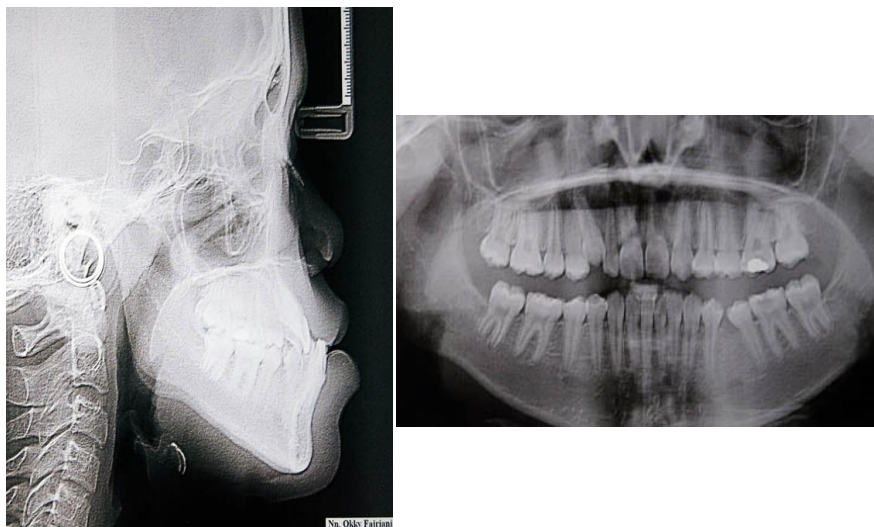


Figure 3 Cephalometric and panoramic photograph before treatment

Diagnosis

The diagnosis in patients is class III skeletal malocclusion accompanied by tooth ectostem 13 and agensis 22.

Treatment Plan

This patient was treated using a 0.018 slot edgewise bracket. In the upper jaw, widening the arch by inserting all the teeth into the arch and replacing agensis teeth with artificial teeth. In the lower jaw, closure of all diastema to reduce the size of the arch. After all the stages, both aligning and leveling using 0.014 niti wire to ss 0.016x0.022 wire are done and the teeth are well and proceed continued with orthognathic surgery.

Treatment

Orthodontic treatment begins with the installation of brackets on all teeth. In the upper jaw, the ectostem 13 teeth are inserted into the arch and the agensis 22 teeth, opening the space by using an open coil spring to get the space that will later be fitted with artificial teeth. The space is opened up to the size of the actual tooth 22 size.

In the lower jaw, derotations were performed on teeth 32, 31, 41 and 42 and the closure of the diastema space in the 34-35 region. Results of cephalometry analysis after treatment obtained $SNA = 82$, $SNB = 80$, $ANB = 2$ and mandibular length = 101. After all the teeth in both the maxilla and mandible were corrected, the treatment was continued with orthognathic surgery to reduce the mandible by 5mm to achieve good interdigitation between maxillary and mandibular teeth.

Treatment Result

After treatment, satisfactory results were obtained, where all the teeth were in the arch and the agensis teeth had been replaced with artificial teeth. All rotated teeth have been corrected and all diastema closed. Interdigitation of the teeth between the upper and the lower jaw has been corrected where the overjet is normal.

Diagnosis

The combination treatment between orthodontic and orthognathic surgery treatments that include facial and jaw surgery [figure 4](#). This is to overcome severe dentofacial abnormalities, also skeletal bone abnormalities. The right time to perform orthognathic surgical treatment is when bone growth has ended, this is to minimize changes that may occur after surgery.^{4,7}



Figure 4 Profile photo after orthognathic surgery

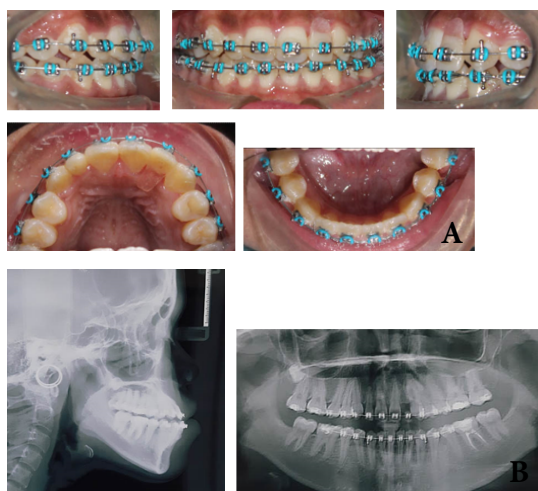


Figure 5 A. Intra oral photographs after orthognathic surgery, B. Cephalometric and panoramic photograph after orthognathic surgery

Cooperation between orthodontists and oral surgeons is needed in treating this type of patient. Good cooperation needs to be established from the beginning, starting from the determination of diagnosis and treatment plan should be established together. In this case, a joint diagnosis and treatment plan was determined. Specifically for orthognathic surgery plans, the final occlusion condition, wafer design, type of surgery, whether single or double jaw, early surgery or late surgery and how much lower jaw will be reduced.^{5,6,8}

After surgery, the patient returns to continue his orthodontic treatment to achieve good interdigitation between the maxillary and mandibular teeth and obtain stability result of the end of treatment [figure 5A](#) and [figure 5B](#).

Conclusion

Patients with skeletal class III malocclusion abnormalities are generally treated with a combination

of orthodontic treatment and orthognathic surgery. A thorough evaluation is needed, both intra and extra oral evaluation, in the context of the consideration of orthognathic surgery to get maximum treatment results.⁹⁻¹²

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None.

Conflict of Interest

The authors report no conflict of interest.

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