



ORTHODONTIC-SURGICAL TREATMENT OF A PATIENT WITH SKELETAL CLASS II MALOCCLUSION: A CASE REPORT

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Abstract: Two methods for treating skeletal problems in adults are camouflage orthodontic treatment and orthognathic surgery. This case report aimed to present the successful treatment of an adult female patient with skeletal Class II malocclusion due to retrognathic mandible through orthognathic surgery. After the fixed orthodontic treatment, the necessary decompensation treatment was applied to the patient who presented to our clinic with the complaint of retrusive mandible and was operated. The dental and skeletal Class I relationship was achieved with functional occlusion after orthodontic and orthognathic surgery. The total treatment time was 23 months. The treatment results showed good improvement in the facial profile.

Keywords: Bilateral sagittal split osteotomy, Camouflage, Malocclusion, Orthognathic surgery, Skeletal class II malocclusion

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Received: January 24, 2022

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Published: May 01, 2022

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Cite as: Kayadüğün A, Büyükcavuş MH, Fındık Y, Baykul T. 2021. Orthodontic-surgical treatment of a patient with skeletal class II malocclusion: A case report. BSJ Health Sci, 5(2): 295-299.

1. Introduction

Skeletal Class II malocclusion with mandibular deficiency is one of the most common problems for which patients seek treatment. In patients with skeletal Class II malocclusion, treatment alternatives vary according to the skeletal maturity level, facial appearance, severity of the malocclusion, and patient's expectations and cooperation (Proffit and Ackerman, 1994; Pancherz, 2000; Arnett and Gunson, 2004; Proffit and Sarver, 2007). While growth modification treatments are applied with removable or fixed functional applications in young patients (Bacetti et al., 2000; Lee et al., 2016; Tomblynn et al., 2016), two methods of treating skeletal problems in adult patients are camouflage orthodontic treatment and orthognathic surgery. Camouflage orthodontic treatment can be an option in case of mild-to-moderate anteroposterior (A-P) skeletal discrepancies with acceptable vertical facial proportions and no transverse skeletal problems (Tucker 1995; Proffit et al., 2007; Canıgür et al., 2012).

Orthognathic surgery combined with orthodontic

treatment is the best treatment alternative to achieve ideal results in terms of function, stability, and aesthetics in patients with advanced A-P skeletal incompatibilities, inappropriate facial aesthetics, transverse maxillary deficiency, and airway problems (Michalik et al., 2005; Conley et al., 2006; Vandarsea et al., 2007; Marchetti et al., 2009; Kinzinger et al., 2009; Bauer et al., 2014).

2. Case Presentation

An 18-year-old woman reported to the Department of Orthodontics with a chief complaint of the retrognathic mandible. An informed consent form and necessary permissions for the use of materials for scientific studies were obtained from her. The clinical examination revealed an angle Class II Division 1 malocclusion with a convex profile, Class II molar and canine relationship, 9 mm of overjet and 2 mm overbite, and posterior crossbite at the left dental arch. The upper midline was coincident with the face, whereas the lower midline was 3 mm deviated to the left (Figs. 1 and 2).





Figure 1. Pretreatment extra and intraoral photographs of the patient.

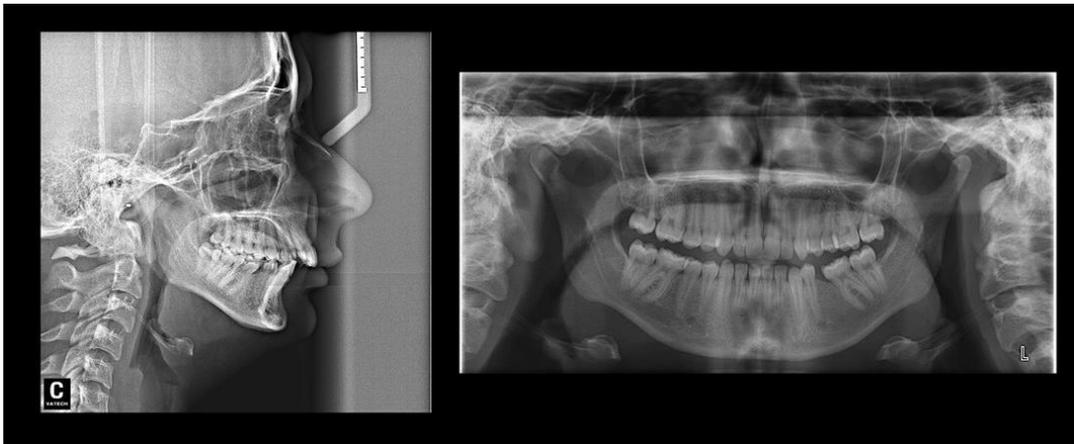


Figure 2. Pretreatment radiographs of the patient.

The pretreatment radiological evaluation according to Steiner's lateral cephalometric showed SNA; 83°, SNB; 76°, ANB; 7°, and GoGn/SN; 34°. Upper and lower incisors were proclined with angles of U1-SN; 107.2° and IMPA; 93°. The skeletal maturation level of the patient was CS5 according to the lateral cephalometric radiograph. Therefore, orthognathic surgery was the treatment choice. The patient underwent orthodontic treatment including teeth leveling, alignment, and decompensation phases with fixed orthodontic appliances before surgery.

Written informed consent was obtained from the patient before starting the orthodontic treatment. All first and second molars were banded and the remaining teeth were bonded with 0.018-in. Roth metal braces. Upper

and lower arches were leveled and aligned using nickel-titanium (NiTi) wires. Wire sequence was 0.014-in. NiTi, 0.016-in. NiTi, 0.018-in. NiTi, 0.016-in. × 0.016-in. NiTi, and 0.016-in. × 0.022-in. NiTi. She was ready for surgery 15 months later.

Presurgical records were taken (Figs. 3 and 4). Eight miniscrews were applied to the patient for intermaxillary fixation (IMF). The mandibular advancement of 6.5 mm with bilateral sagittal split osteotomy was planned and performed. Titanium plates were used for rigid fixation. IMF was postoperatively performed to protect the new position of jaws against the muscle forces.

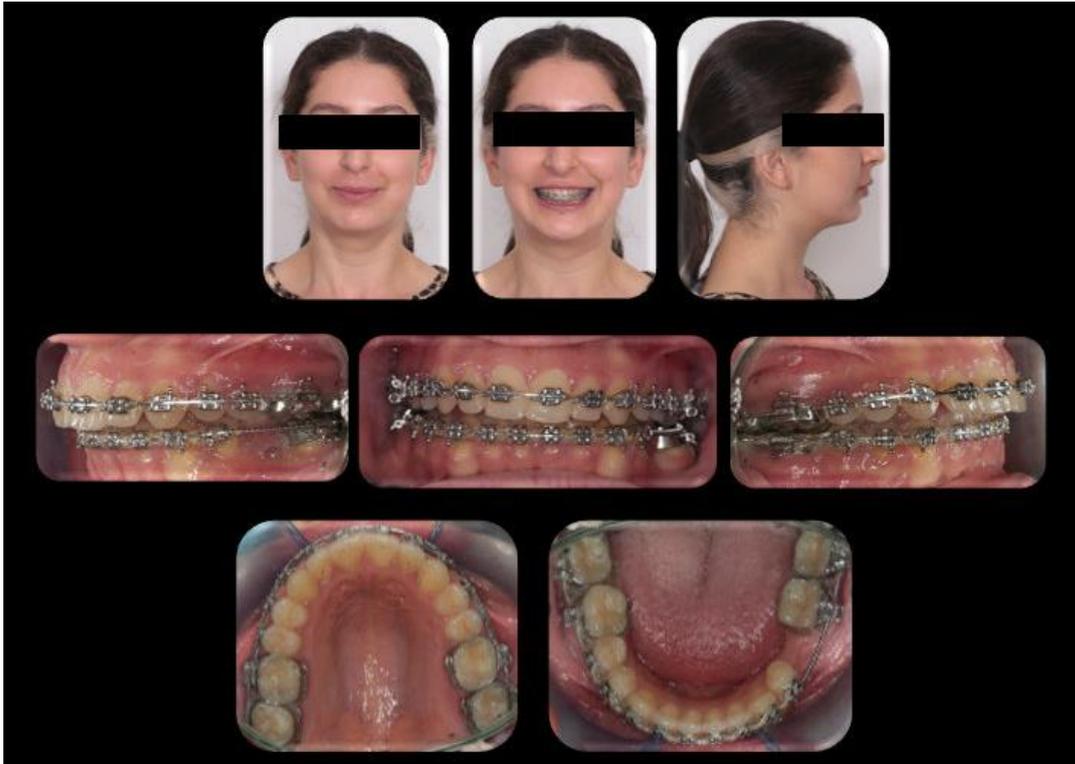


Figure 3. Presurgical extra and intraoral photographs of the patient.

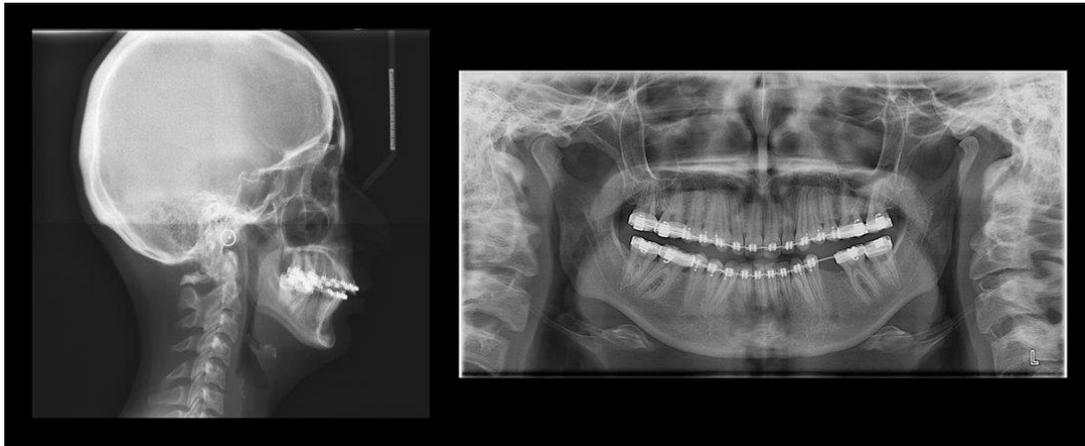


Figure 4. Presurgical radiographs of the patient.

The fixed orthodontic appliance was removed after 7 months. The lower canine-to-canine fixed lingual retainers were inserted after debonding the braces. An essix retainer for the upper and lower jaws was applied for approximately 1.5 years. An essix retainer was used during the day for 8 months and only at night for 8 months for stabilizing the posterior teeth. Functional occlusion and dental and skeletal Class I relationship were achieved after orthodontic and orthognathic surgery (Table 1). A convex soft tissue profile due to mandibular retrognathia was corrected by mandibular advancement. The patient had 2.5-mm overjet and 2-mm overbite. The lower dental midline was corrected and became coincident with the upper and facial midline (Figs. 5 and 6).

3. Discussion and Conclusion

Adult patients with skeletal Class II malocclusion can be treated using orthodontic (camouflage) or combined orthodontic–orthognathic surgery procedures. The decision of how to provide optimal treatment to a patient with Class II malocclusion is based on a wide range of research including clinical, radiological, study models, and photograph examinations (Casas et al., 2017).

The dental movement limits the effectiveness of camouflage treatment, so significant improvement in the soft tissue profile is not possible. Orthodontic–orthognathic surgery treatment provides harmonious skeletal, facial, and soft tissue relationships and improves occlusal function (Sarver and Yanosky, 2005; Casas et al.,

2017). The present case had skeletal discrepancies, so orthodontic-orthognathic surgery was planned. Pretreatment and post-treatment lateral cephalometric tracings of the patient were evaluated. SNB and ANB of the patient changed by 4°. Facial convexity was reduced. Molars and canines were achieved in Class I relationship with ideal overjet and overbite. Malocclusions may affect the life of the patient with skeletal malocclusions. One of the main reasons for an

adult patient with Class II malocclusion to seek treatment is dental and facial aesthetics. The case report presented the treatment process and results of a patient with skeletal Class II malocclusion. An appropriate facial aesthetics, dental arches, and functional occlusion were achieved through a multidisciplinary approach including orthodontic treatment and surgery.



Figure 5. Post-treatment extra and intraoral photographs of the patient.



Figure 6. Post-treatment radiographs of the patient.

Table 1. Lateral cephalometric measurements

| Cephalometric measurement | Initial | Presurgery | Post-treatment |
|---------------------------|---------|------------|----------------|
| SNA (°) | 83° | 83° | 83° |
| SNB (°) | 76° | 76° | 80° |
| ANB (°) | 7° | 7° | 3° |
| Wits (mm) | 5.3 | 6.1 | 2.7 |
| GoGn/SN (°) | 34° | 34° | 35° |
| FMA (°) | 27° | 27.3° | 28° |
| U1-SN (°) | 107° | 104° | 104° |
| IMPA (°) | 93° | 92° | 88° |
| Overjet (mm) | 7 | 8 | 2.5 |
| Overbite (mm) | 0.5 | 1.5 | 2.2 |
| UL-E (mm) | 3.5 | 3.9 | 4 |
| LL-E (mm) | 4.7 | 4.6 | 2 |

Author Contributions

All authors had equal contribution and authors reviewed and approved the manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest.

Ethical Approval/Informed Consent

Written an informed consent form was obtained from the patients for the case presentation and necessary information was given to the family.

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