Süleyman Demirel Üniversitesi
Sağlık Bilimleri Dergisi
Cilt 11, Sayı 4, 500 - 506, 2020
Suleyman Demirel University
Journal of Health Sciences
Volume 11, Issue 4, 500 - 506, 2020

Multidisciplinary Treatment of Skeletal Class III Malocclusion with Orthognathic Surgery: Two Case reports

İskelet Sınıf III Maloklüzyonunun Ortognatik Cerrahi ile Multidisipliner Tedavisi: İki Olgu Sunumu

Muhammed Hilmi BÜYÜKÇAVUŞ[1*], Yavuz FINDIK[2], Timuçin BAYKUL[2]

[1] Süleyman Demirel Üniversitesi Diş Hekimliği Fakültesi Ortodonti AD, Isparta, Türkiye
[2] Süleyman Demirel Üniversitesi Diş Hekimliği Fakültesi Ağız, Diş ve Çene Cerrahisi AD, Isparta, Türkiye
Alınış / Received: 13.11.2020 Kabul / Accepted: 23.12.2020 Online Yayınlanma / Published Online: 31.12.2020

Özet

Amaç: Bu olgu sunumu, iskeletsel Sınıf III maloklüzyonlu iki hastanın ortodonti ve cerrahi işbirliği ile yapılan tedavisini sunmaktadır. **Olgu:** Hastalarımızın temel şikâyeti olumsuz yüz estetiğidir; ekstraoral muayenede içbükey bir profile sahip oldukları, ağız içi muayenede ağız içi muayenede Sınıf III kanin ve molar ilişkilerinin olduğu görülmüştür. Tedavi planında sabit ortodontik tedavi ile alt ve üst dental arklarda seviyeleme-hizalama ile dekompansasyon yapıldıktan sonra ilk olguda sagittal split ramus osteotomisi ile 6 mm mandibula geri alındı; ikinci olguda bimaksiller ortognatik cerrahi (4 mm maksiller ilerletme ve 4 mm mandibular set-back) yapıldı. **Sonuç:** Ameliyat sonrası yapılan ortodontik tedavi ile dişler uygun pozisyonlarına getirilerek oklüzyon düzeltildi ve tedavi sonunda iskelet ve dişsel Sınıf I ilişkisi ile ideal bir yumuşak doku profili elde edildi.

Anahtar Kelimeler: Sınıf III maloklüzyon, ortognatik cerrahi, ortodontik tedavi

Abstract

Objectives: This case report presents the treatment of two patients with skeletal Class III malocclusion, performed in collaboration with orthodontics and surgery. **Case:** The main complaint of our patients is negative facial aesthetics; it was observed that it had a concave profile in the extraoral examination, and and they had Class III canine and molar relationships on intraoral examination. In the treatment plan, following leveling and decompensation in the lower and upper dental arch with fixed orthodontic treatment, in the first case, 6 mm mandibular set back was performed with sagittal split ramus osteotomy; in the second case, bimaxillary orthognathic surgery (4 mm maxillary advancement ve 4 mm mandibular set-back) was performed. **Conclusion:** With orthodontic treatment performed after surgery, the occlusion was corrected by bringing the teeth to their proper positions, and at the end of the treatment, a ideal soft tissue with skeletal and dental Class I relationship was achieved.

Keywords: Class III malocclusion, orthognathic surgery, orthodontic treatment

Introduction

Skeletal Class III malocclusions are a multifactorial problem consisting of maxillary retrognathism, mandibular prognathism, or a combination of these (1). Its treatment is often challenging for orthodontists. In severe skeletal Class III malocclusions, it can significantly affect many aspects of the patient's life, including psychosocial status, aesthetics, chewing, speech, and even breathing, among other orthodontic problems (2).

Skeletal Class III malocclusions can be treated with orthopedic appliances such as maxillary protraction with a face mask and chin cap in adolescents in the growth-development period (3). Treatment in adult patients is both more difficult and more complicated. While dentoalveolar camouflage treatments are performed in patients with an appropriate indication and without a problem with profile view; orthognathic surgery is indispensable for both profile and facial appearance and dental correction (4-6).

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)

The aim of this case report is to present the treatment of two female adult skeletal Class III patients by orthodontic and orthognathic surgery.

Case 1

It was determined that the female patient who applied to our clinic with the need for orthodontic treatment was at the chronological age of 17 years and 3 months and growth-development was completed according to the hand-wrist radiograph. It was observed that the patient had a concave profile in the extraoral examination (Figure 1), and she had Class III canine and molar relationships on intraoral examination.

Figure 1. Initial intraoral and extraoral photographs of Case 1.

Skeletal Class III discrepancy was found in maxillomandibular parameters on cephalometric examination (SNA = 79.4°, SNB = 86.1°, ANB = -6.7°). The inclinations of incisors were decompensated with orthodontic treatment before surgery. Since the patient did not want tooth extraction and distalization, the compensation in maxillary incisors could not be resolved completely (Figure 2). At the last stage of orthodontic treatment, the models of the patient were taken and occlusion simulation was performed after surgery. Crimpable hooks orthodontic models required for intermaxillary fixation were applied to the patient before surgery. An acrylic splint was made by taking the models of the patient.

Figure 2. Pre-surgery intraoral and extraoral photographs of Case 1.

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)

With the surgical operation performed under general anesthesia with sagittal split ramus osteotomy, the mandible was moved 6 mm backward and fixed with rigid fixation. On the mandible, fixation was made with two I-shaped miniplates. With the orthodontic treatment performed after surgery, the occlusion was corrected by bringing the teeth to their proper positions, and the total treatment was completed in 20 months. At the end of the treatment, a ideal soft tissue relationship with skeletal and dental Class I relationship was obtained (Figure 3). The cephalometric radiographs taken at the beginning of the treatment and at the end of the treatment are given in Figure 4.

Figure 3. Final intraoral and extraoral photographs of Case 1.

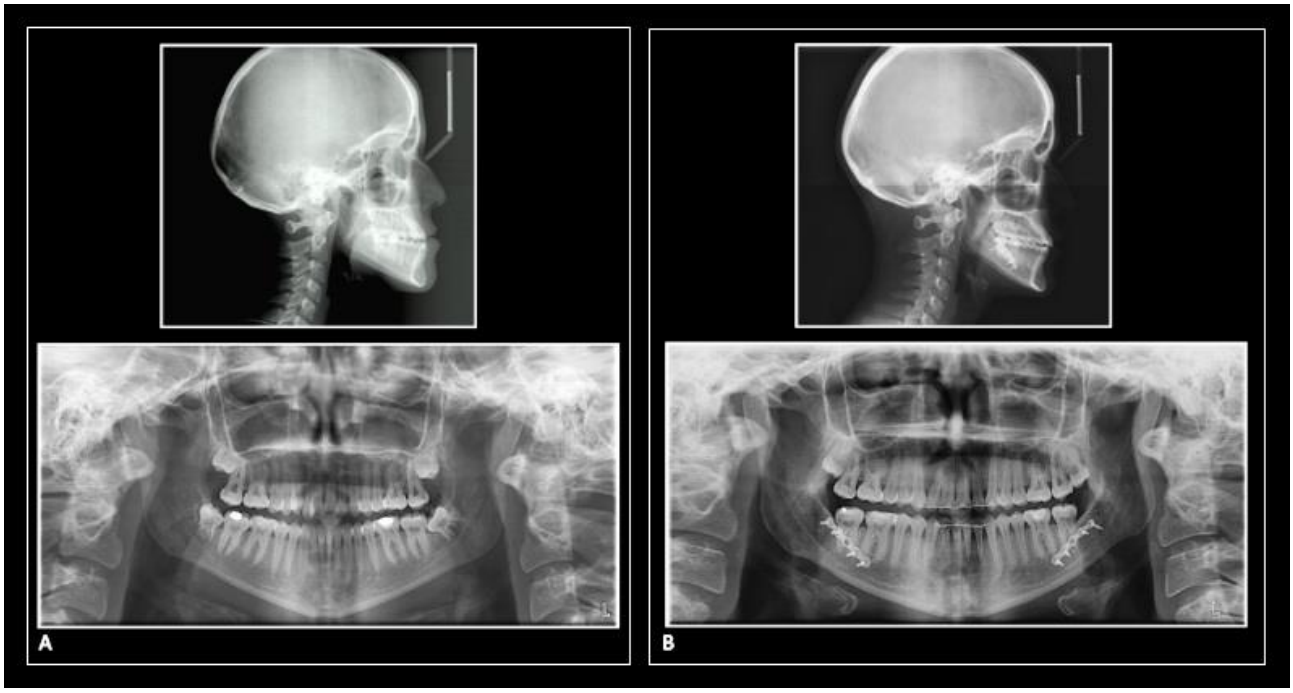

Figure 4. Pre- (A) and post-treatment (B) radiographs of Case 1.

Although there is a significant increase in the SNA and ANB angles at the end of the treatment, it is observed that there is protrusion in the upper and lower incisors. The retention phase was initiated after the fixed appliances were removed. A lingual retainer was placed at the intercanine distance of the maxilla and mandible.

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)

Case 2

The female patient, whose chronological age is 16 years and 11 months, applied to the Department of Orthodontics. In the anamnesis taken, no anomaly was found in her personal and family history. The main complaints of the patient; non-aesthetic facial and profile appearance is the open bite of the anterior teeth. The profile of the patient is concave and there is no asymmetry in the frontal view (Figure 5). The lower dental midline is deviated 2 mm to the left. Negative overjet was found to be -3 mm, and overbite to -1 mm. The positions of lower and upper incisors indicate that there is dental compensation and the negative overjet is masked. The patient had good oral hygiene.

Figure 5. Initial intraoral and extraoral photographs of Case 2.

Cephalometric analysis shows skeletal Class III relationship. Class III malocclusion was determined to originate from maxillary retrognathia and mandibular prognathia under the light of cephalometric analysis findings (SNA = 77°, SNB = 84°, ANB = -7°).

Figure 6. Pre-surgery intraoral and extraoral photographs of Case 2.

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)

Before orthognathic surgery, 0.022 inch slot MBT brackets were applied to the lower and upper teeth. Initial leveling and decompensation were done (Figure 6). Orthognathic surgery application includes standard Le Fort I osteotomy and sagittal split ramus osteotomy. After mobilization, the maxilla was brought to the planned position (4 mm advance) using reference points and an occlusal guide plate. For the fixation process, two L-shaped miniplates were applied to both maxillary pieces. Afterwards, 4 mm set-back was applied to the mandible with a sagittal split ramus osteotomy. On the mandible, fixation was made with two I-shaped miniplates. Final occlusion was achieved with orthodontic treatment after surgery. The total treatment time is 17 months. At the end of the treatment, the facial profile and aesthetics were corrected (Figure 7). Post-treatment intraoral photographs show Class I canine and Class I molar relationship. Negative overjet has been eliminated and ideal overjet and overbite relationship has been achieved. At the end of the treatment, protrusion was observed in the maxillary and mandibular incisors on cephalometric radiography (SNA = 81°, SNB = 80°, ANB = 1°)(Figure 8).

Figure 7. Final intraoral and extraoral photographs of Case 2.

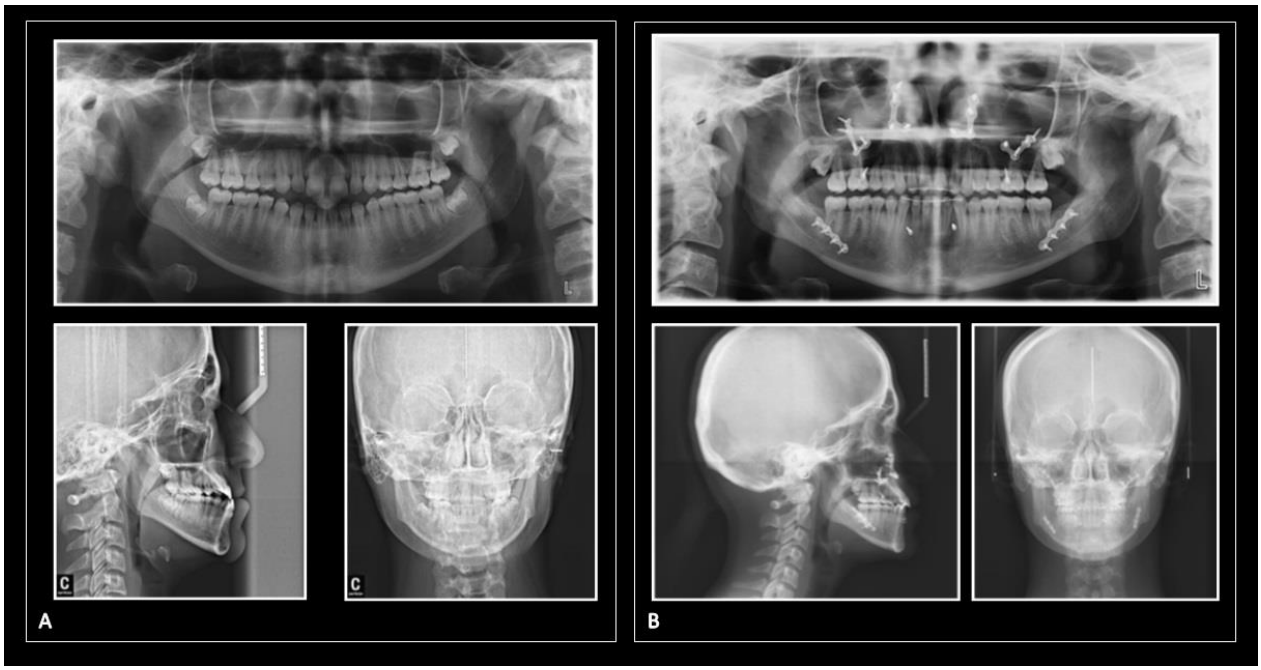

Figure 8. Pre- (A) and post-treatment (B) radiographs of Case 2.

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)

Discussion

Skeletal Class III malocclusion can be caused by a retrognathic maxilla, a prognathic mandible, or a combination of both conditions (7,8). In this case report, the treatment processes of two patients with skeletal Class III malocclusion in whom maxillary retrognathia and mandibular prognathia are combined together are described.

In the treatment of the patients, orthodontic and surgical treatment were applied in combination, and at the end of the treatment, a skeletal and dental Class I relationship with a ideal soft tissue relationship was obtained. Maintaining the normal functions of the jaws, functional occlusion, facial aesthetics and stabilization of all these are among the aims of orthognathic surgery (9).

The success of orthognathic surgery is based on a good planning and being prepared for complications (10,11). In our cases, both a good occlusion and a suitable facial aesthetics were obtained after a treatment performed in accordance with the rules of orthognathic surgery. Guven stated that six aspects should be considered in planning dentofacial problems (10). These; maxilla – skull base, mandible – skull base, maxilla – mandible, maxillary teeth – maxilla, mandibular teeth – mandible, maxillary and mandibular teeth are the relationships between each other. All these relationships seem to be in harmony in this case.

Rigid fixation is used as a routine fixation technique after Lefort I osteotomies. Although some studies indicate that rigid fixation provides more stable results, various studies have reported that there is no difference between rigid and non-rigid fixations (12,13). Rigid fixation procedure was applied in our patient after LeFort I and sagittal split ramus osteotomies performed in sagittal direction.

While skeletal Class III malocclusions can be treated with various orthodontic and orthopedic devices in the early stages of growth, orthognathic surgery is required in adult individuals (14). As a result, the treatment process and results of a patient with skeletal Class III malocclusion are presented in this study.

Conclusion

In conclusion, in this case report, it is seen that the skeletal Class III patient who came to our clinic in adulthood was treated according to his needs. With a multidisciplinary approach including orthodontics and surgical treatment, an appropriate facial aesthetics, ideal dental arches and a functional occlusion have been achieved.

References

1. Guyer EC, Ellis EE, McNamara JA, Behrents RG. Components of Class III malocclusion in juveniles and adolescents. Angle Orthod. 1986;(56):7–29.
2. Uslu O, Akcam MO. Evaluation of long-term satisfaction with orthodontic treatment for skeletal Class III individuals. J Oral Sci. 2007;49(1):31-39.
3. Proffit WR, Fields HW, Sarver DM. Contemporary Orthodontics. 4th Ed. St. Louis: Mosby Elsevier. 2007.
4. Janson G. Extreme Dentoalveolar Compensation in the Treatment of Class III Malocclusion. Am J Orthod Dentofacial Orthop. 2005;128:787-94.
5. Moullas A, Palomo JM, Gass JR, Amberman BD, White J, Gustovich D. Nonsurgical treatment of a patient with a Class III malocclusion. Am J Orthod Dentofac Orthop. 2006;129:111-18.
6. Pancherz H. Dentofacial orthopedics or orthognathic surgery: is it matter of age? Am J Orthod Dentofacial Orthop. 2000;117:571-574.
7. Güngör AY, Turkkahraman H, Baykul T, Aydın A. İskeletsel Sınıf III Malokluzyonun Ortognatik Cerrahi Tedavisi: Olgu Raporu. SDÜ Sağ Bil Derg. 2012;3(2):85-88.
8. Delaire J. Maxillary development revisited: rele¬vance to the orthopedic treatment of Class III ma¬locclusions. Eur J Orthod 1997;19:289–311.
9. Bergamo AZN, Andrucioli MCD, Romano FL, Ferreira JTL, Matsumoto MAN. Orthodontic–surgical treatment of class III malocclusion with mandibular asymmetry. Braz. Dent. J. 2011;22:151–56.
10. Guven O. Sınıf III vakalarında ortognatik cerrahi (vaka raporu). Türk Ortodonti Derg. 1998;1:245–48.

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)

11. Enacar A, Aksoy AÜ. Ortognatik cerrahi uygulanmış vakalarda profil değişiklikleri. Türk Ortodonti Derg. 1988;1:80–89.
12. Egbert M, Hepworth B, Myall R, West R. Stability of LeFort I osteotomy with maxillary advancement: a comparison of combined wire fixation and rigid fixation. J Oral Maxillofac Surg 1995;53:243-8.
13. Wagner S, Reyneke JP. The LeFort I downsliding osteotomy: a study of long-term hard tissue stability. Int J Adult Orthod Orthognath Surg. 2000;15:37-49
14. Başçiftçi FA, Orhan M, Uçkan S, Üşümez S. İskeletsel Sınıf III Olgularda Ortodontik-Cerrahi Yaklaşımlar (İki Vaka Raporu). T Klin Diş Hek Bil. 2001;7:138-44.

*Corresponding author: muhammedbuyukcavus@sdu.edu.tr

DOI:10.22312/sdusbed.825341
OLGU SUNUMU (CASE REPORT)