

The interdisciplinary treatment of anterior openbite

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Skeletal anterior openbites are complicated malocclusions characterized usually by overgrowth of the maxillary-mandibular posterior dentoalveolar heights. Several methods were introduced to treat skeletal openbites such as passive bite blocks, high pull headgears, fixed mechanics and vertical elastics. In this case report, the purpose was to present the interdisciplinary treatment of the skeletal anterior openbite malocclusion and polydiastema. The adult female patient had skeletal (ANB=6°) and dental Class II relationship and 7, 8 mm anterior openbite with increased lower facial height. Our objectives were to: 1- impact maxilla, advance-rotate mandible 2-correct the positions of the anterior teeth 3-enhance facial profile and lip closure 4-establish ideal occlusion 5-improve smile and dental esthetics. Ideal overjet and overbite values were obtained. The prosthodontic and periodontal treatments were performed after orthodontic treatment. Better esthetics, improved smile and function were also obtained with the patient's satisfaction.

KEY WORDS

Orthognathic surgery, openbite, malocclusion

Skeletal anterior openbites are complicated malocclusions characterized usually by overgrowth of the maxillary-mandibular posterior dentoalveolar heights. These developments results with longer vertical facial dimensions and steeper mandibular plane(1,2). Several methods were introduced to treat skeletal openbites such as passive bite blocks(3), high pull headgears(4), fixed mechanics and vertical elastics(5-7). But these methods usually are not successful choices for adult patients and the most effective way is surgical procedure containing impaction of the maxilla, counter clock wise rotation of mandible (8).

In this case report, the purpose was to to present the interdisciplinary treatment approaches for an openbite patient with polydiastema.

CASE

The adult female patient had skeletal (ANB=6°) and dental Class II re-

lationship and 7, 8 mm anterior openbite with increased lower facial height. There were polydiastema and microdontia in the lower and upper dental arches. (Figure 1 and 3 for pretreatment radiographies). After the detailed examinations with clinical-radiographic records of the patient, we planned 5 steps treatments. However, there was polydiastema arising from microdontia. Our objectives were to: 1- to impact the maxilla, advance and rotate the mandible 2- to correct the positions of the anterior teeth 3- to enhance facial profile and lip closure 4-to establish ideal occlusion 5- to improve smile and dental esthetics. After levelling of the upper and lower dental arches by fixed orthodontic appliances (0.018" Roth braces system), lastly 0.017"x0.025" rectangular arch wires were applied. The presurgical fixed treatment goals were achieved at beginning period, the patient was prepared for surgery. Before surgery, it was planned to impact posterior part of the maxilla 3 mm, to advance mandible 7 mm, besides to rotate mandible counter clock wise (approximately 20°). After the operation, the heavy intermaxillary elastics were applied to canine segments bilaterally and patient was instructed about full time use of these elastics for one month except opening closing exercise times that longed for 3 weeks (Figure 5, 6). The following orthodontic treatment continued for 5 months. Essix retainer for mandible and Hawley reatiner for maxilla were prepared for retention.

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Figure 1.
*Pre treatment
photographs*



Figure 2.
*Post treatment
photographs*

Abnormal vertical skeletal dimensions changed after the surgery (Table 1, Figure 3). Ideal overjet and overbite values were obtained (Figure 1, 2). The pre and post treatment superimposition was performed at Sella-Nasion line (Figure 4). The prosthodontic (full mouth fixed prosthodontics) and periodontal (scaling and root planing procedures) treatments were performed after orthodontic treatment. Better esthetics, improved smile and function were also obtained with the patient's satisfaction.

DISCUSSION

With the limitations of orthodontic treatment, it is agreed that this type of case can ideally be treated with the combination of orthodontic-surgical procedures(9). By applying the surgery, we had some extra advantages such as overcorrection for overbite and better post treatment stability(10).

At present, surgical superior positioning of maxilla, with or without bilateral sagittal split osteotomies is usually the treatment method for such cases(11). Besides, surgical procedures involving LeFort I osteotomies, like this case, represent more stable results than those obtained with only mandibular osteotomies(12,13).

In this case, we preferred rigid fixation methods. At past, wire fixation methods were chosen for the osteotomies(14). But in 1980s, the rigid fixation methods

such as miniplates and screws were introduced to provide less relapse(15). In a similar study comparing rigid versus wire fixation methods, the researchers found no relapse difference for maxilla. But for mandible, rigid fixation methods were better for stability(16).

The application of orthodontic and surgical procedures at this level of age was not risky. The stability of the surgery was proven not to be influenced by gender, age, orthodontic treatment type or intermaxillary fixation period(17,18).

Table 1.
Pre and Post treatment changes

	PRE TREATMENT	POST TREATMENT
SNA	78	79
SNB	72	75
ANB	6	4
FMA	35,5	33
SN-GoGn	51	48,5
Y axis angle	79,5	75,5
ANS-Me	81mm	79mm
Overjet	6,2 mm	3,4 mm
Overbite	-7,8 mm	0,5 mm

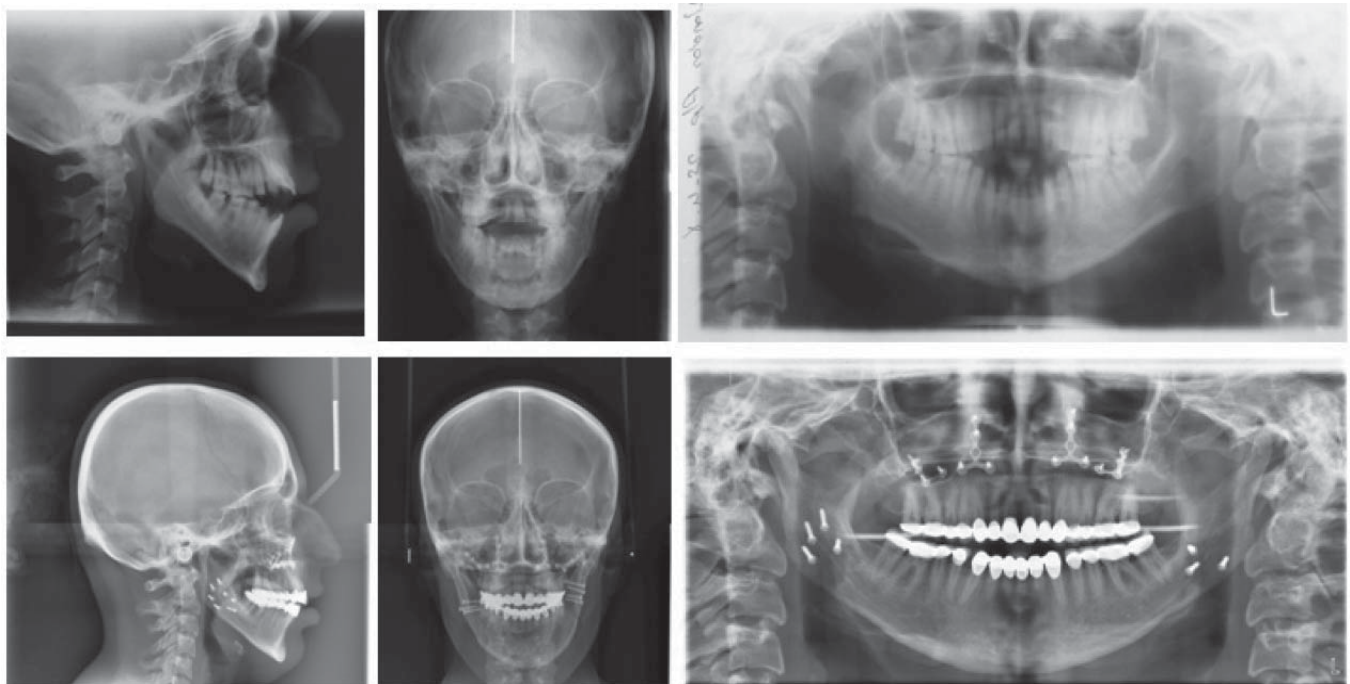


Figure 3.

Pre and post treatment radiographies

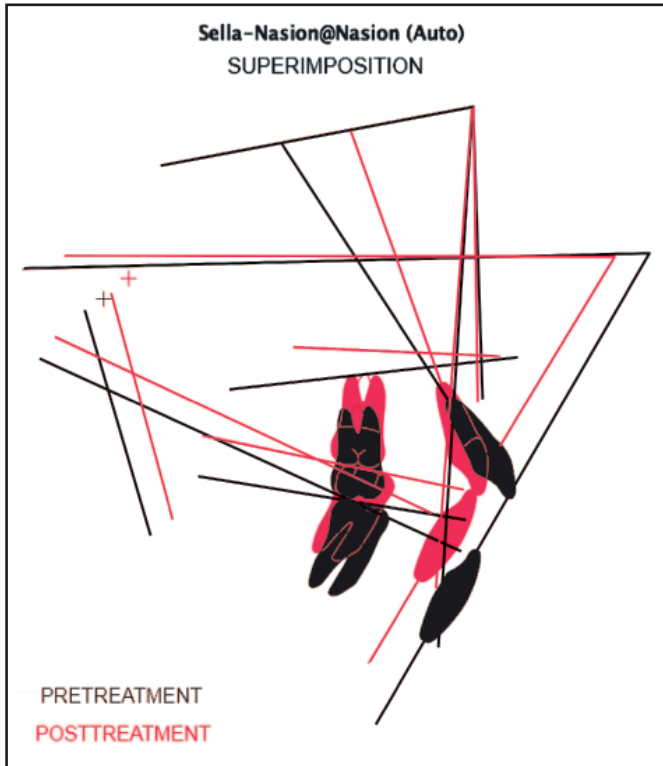


Figure 4.
Pre and Post Treatment Superimposition

By applying fixed orthodontic treatment before surgery, we corrected dental compensation and aligned all the teeth. The pre-surgical orthodontic treatment should firstly aim at levelling and dental decompensation. Lower and upper anterior teeth should be taken into ideal position on the basis of skeletal unit. But the retrusion of the upper incisors must be avoided because LeFort I with posterior intrusion will affect the upright position of the incisors(19).

The advancement and counter clock wise rotation of the mandible resulted in 3° increase of SNB angle. There was no important difference in SNA before-after surgery as expected because we did not effect sagittal plane of maxilla or point A. Due to impaction of the maxilla, SN-PP angle increased and counter clockwise rotation of the mandible decreased SN-GoGn angle. After surgery, total and lower facial heights decreased significantly (2,8 mm for lower height). No statistically significant difference for posterior facial height was seen. This finding indicates that the mandibular ramus remained in its original position. This is important for temporomandibular joints' health and there was no sign of complaint after surgery. For the upper incisors, pre-surgical orthodontic extrusion mechanics were not applied because it just camouflages the deformity and sometimes makes unnatural appearance(20).

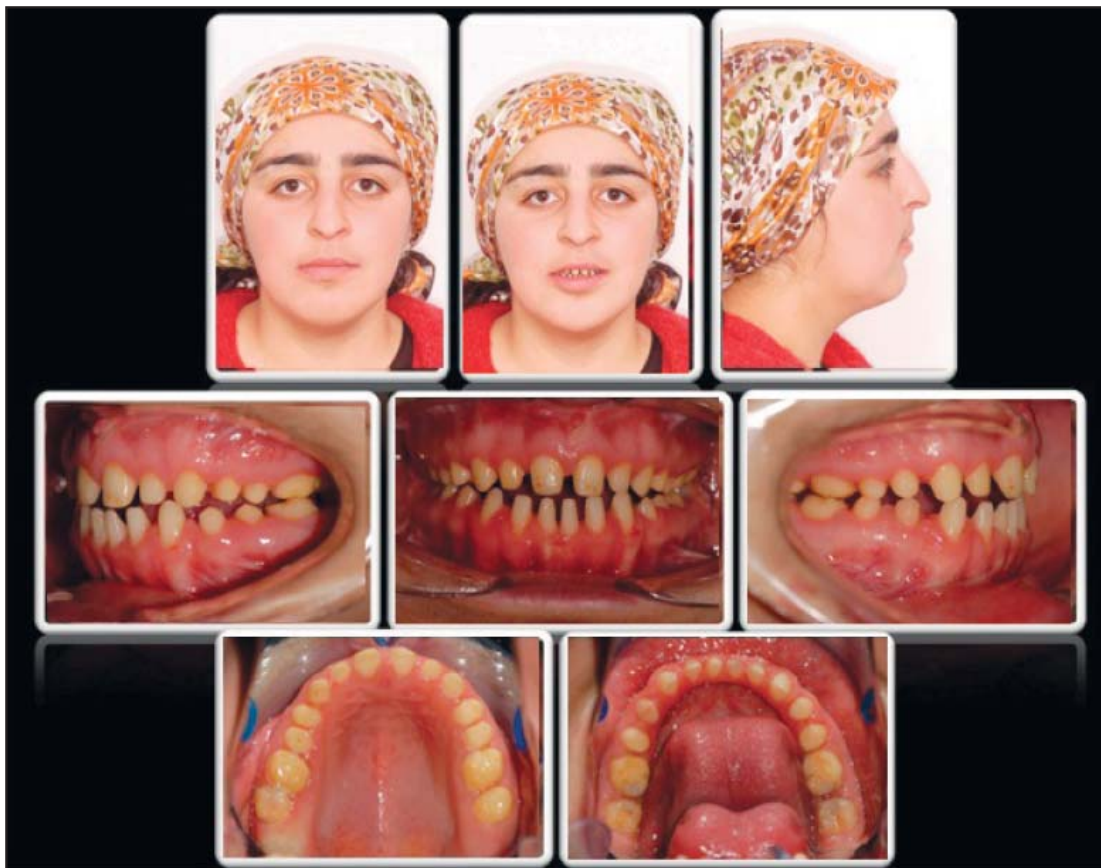


Figure 5.
Post surgery photographs

Although post-operative intermaxillary fixation (IMF) is still controversial, we applied IMF for 2 weeks. In a similar study, it was concluded that omitting IMF had no negative effect on stability of the fragments(21). There are different applications for IMF protocols in literature and these are all indicate that the reason for using different IMF protocols was mainly the surgeon's choice.

Both mandibular and maxillary teeth have a discolored and dwarfed appearance, poly diastemas, resembling the deciduous dentition in size. In order to obtain ideal dental relationships, the appropriate Bolton ratios must be provided. For our case, it was needed to increase tooth sizes. For the treatment of polydiastema, the fixed prosthodontics were applied. Before fixed prosthodontics, applying orthodontic treatment is usually reasonable because inclinations, rotations will be corrected and teeth will be in accordance with apical basis, so the risks for marginal or apical bone loss after prosthodontics will be minimized (22).

CONCLUSION

The orthodontic-orthognathic approaches for adult open bite patients can be ideal treatment modality. The patient treated with LeFort I impaction osteotomy and bilateral sagittal split osteotomy exhibited good skeletal and dental relationships at the post treatment phase. To compensate the relapse and enhance stability, IMF was also performed. The skeletal and dental treatment goals were achieved with patient's satisfaction.

Ön açık kapanışın disiplinler arası tedavisi

İskeletsel ön açık kapanışlar genellikle maksilla ve mandibulanın posterior dentoalveoler segmentinde aşırı büyüme ile karakterize maloklüzyonlardır. İskeletsel açık kapanış tedavileri için pasif ısırma bloğu, oksipital headgear, sabit mekanikler ve vertikal elastikler gibi metotlar kullanılmaktadır. Bu vaka raporunda ; polidiastema ve ön açık kapanışın disiplinler arası tedavisinin sunulması amaçlanmıştır. Yetişkin bayan hasta iskeletsel ve dental sınıf II ilişkilere, 7.8 mm lik açık kapanışa ve artmış ön yüz yüksekliğe sahipti. Planımız: 1-Maksillayı gömmek, mandibulada rotasyon ve ilerletme yapmak 2-Ön dişlerin pozisyonunu düzeltmek 3-Dudak kapanışı ve yüz profilini iyileştirmek 4-İdeal oklüzyonu sağlamak 5- Dental ve gülme estetiğini iyileştirmekti. Ortodontik tedavi sonrası protetik ve periodontal tedaviler uygulandı. Hasta memnuniyeti ile beraber daha iyi bir estetik, iyileştirilmiş gülme ve fonksiyon elde edildi.

Anahtar Kelimeler: Maloklüzyon, ortognatik cerrahi, açık kapanış

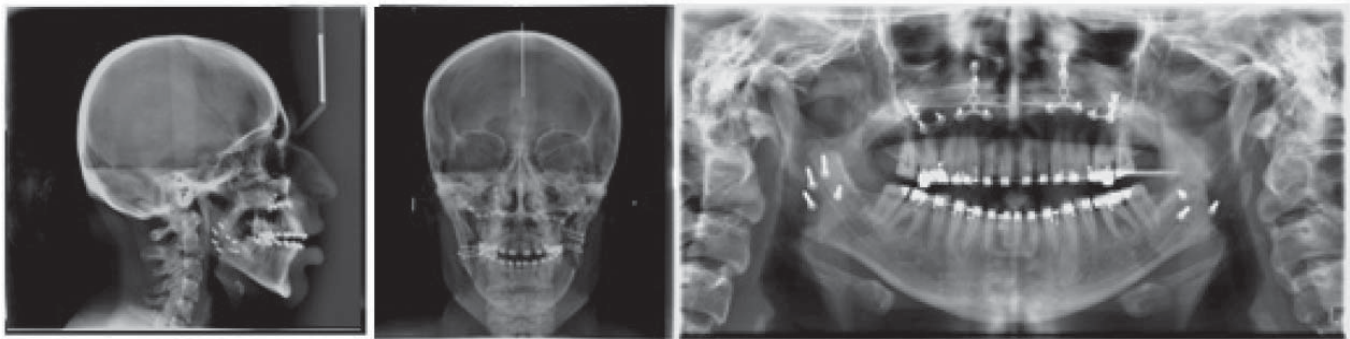


Figure 6.

Post surgery radiographs

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