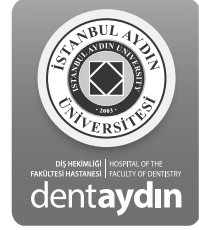




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TREATMENT OF SKELETAL UNILATERAL CROSSBITE WITH ASYMMETRIC RAPID MAXILLARY EXPANSION AND FIXED ORTHODONTIC APPLIANCES: A CASE REPORT

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ABSTRACT

The aim of this case report is to present a female patient with skeletal Class I, dental left Angle Class I relationship with skeletal unilateral posterior crossbite was treated by using asymmetric rapid maxillary expansion appliance and fixed orthodontic treatment. A 13-year, 9-month female came to our clinic with the complaint of infraposition of upper right canine. In clinical and radiographic evaluation, skeletal class I and dental left Angle class I relationship with skeletal unilateral posterior crossbite were found. Treatment was started with asymmetric rapid maxillary expansion appliance.

After 6 months, the transversal relationship correction between maxillara and mandibula were achieved. 0.022 slot MBT straightwire brackets were applied to the upper and lower teeth after maxillary expansion treatment. Finally, in the case of skeletal Class I, dental left Angle Class I relationship with skeletal unilateral posterior crossbite was treated in 15 months with a good occlusion, normal overbite-overjet and achieved dental Angle Class I relationships.

Keywords: *Unilateral Cross-Bite, Maxillary Expansion, Fixed Otrhodontic Appliances*

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ASİMETRİK HIZLI ÜST ÇENE GENİŞLETME VE SABİT ORTODONTİK APAREYLERLE İSKELETSEL TEKTARAFI ÇAPRAZ KAPANIŞIN TEDAVİSİ: OLGU SUNUMU

ÖZ

Bu vaka raporunun amacı; iskeletsel Sınıf I ve dişsel sol Angle Sınıf I posterior çapraz kapanışı olan kadın hastanın tek taraflı üst çene genişletme apareyi ile sabit ortodontik tedavisini içeren olguyu sunmaktır. Kliniğimize 13 yıl 9 aylık kadın hasta sağ üst köpek dişinin üstte olması şikâyetiyle başvurdu. Yapılan klinik ve radyografik değerlendirmede iskeletsel Sınıf I, dişsel sol Angle Sınıf I ve posterior çapraz kapanış bulundu. Tedaviye asimetrik hızlı üst çene genişletme apareyi ile başlandı. 6 ay sonra maksilla

ve mandibula arasında transversal ilişki sağlandı. Üst çene genişletme tedavisinden sonra alt ve üst dişlere 0.022 slot MBT straightwire braketler uygulandı. Sonuç olarak iskeletsel Sınıf I ve dişsel sol Angle Sınıf I posterior çapraz kapanış olan vaka 15 aylık tedavi sonucunda dişsel Angle Sınıf I ilişkilerle birlikte normal overbite ve overjete sahip iyi bir okluzyon sağlanmıştır.

Anahtar Kelimeler: Tek Taraflı Çapraz Kapanış, Üst Çene Genişletme, Sabit Ortodontik Tedavi

INTRODUCTION

Posterior cross closure is a common type of malocclusion in orthodontics. The prevalence of posterior crossbite, which can be bilateral or unilateral, is between 2% and 16%. Studies showed that unilateral cross bite is predominance ⁽¹⁻⁶⁾. The etiological factors of posterior crossbite are sucking habits and obstruction of the upper airway ^(3, 7, 8).

The effects of rapid maxillary expansion procedure on craniofacial and dentoalveolar structures are well documented in the literature ^(9, 10). Use of the RME procedure with asymmetric orthopedic expansion for the treatment of patients with true unilateral crossbite has been studied. These studies have described asymmetric maxillary expansion

for avoid undesirable non-occlusion effect with modified RME appliance ^(11, 12). Therefore modified acrylic bonded RME appliance with locked mechanism on the non-crossbite side allows to clinicians to treat unilateral posterior crossbite with unilateral orthopedic effects.

CASE REPORT

A 13 years 9 months female patient presented for initial examination at the orthodontic clinic in good general health and no history of serious illness or injury. The chief complaint of the patient was related to the fact that the upper right canine was infraposition. The patient presented with an Angle Class I malocclusion, convex profile, 1 mm overjet and 1.5mm overbite and unilateral posterior crossbite (Fig.1)

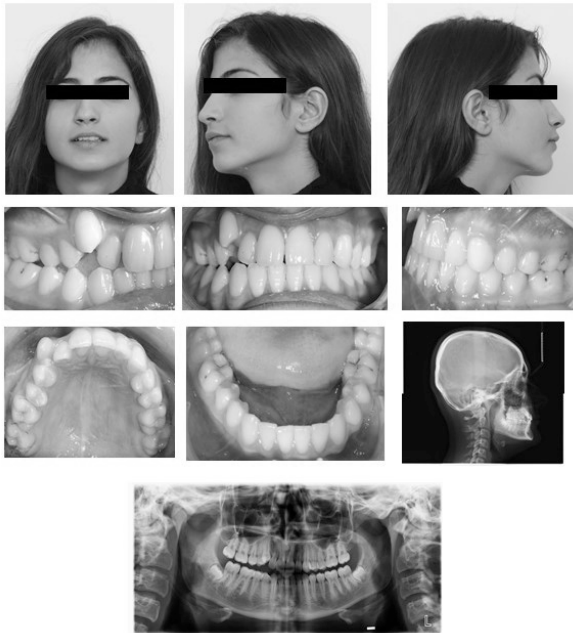


Figure 1. Facial appearance, intraoral view and radiological images of the patient before treatment

The cephalometric radiograph showed that the patient was postpeak skeletal stage (CS4). The cephalometric radiograph tracing showed: normal positioned upper and lower incisors ($I-NA:22.5^\circ$, $1/ NA:2.6\text{mm}$, $1-NB:18.2^\circ$, $1/ NB:1.4\text{mm}$), Class I skeletal pattern with unilateral posterior crossbite, ANB angle= 2.4° , ($SNA = 82^\circ$ and $SNB = 79.6^\circ$) and normal growth pattern in the vertical orientation ($SN-GoGn=32.9^\circ$, $FMA=24^\circ$). Soft tissue evaluation showed normal upper and retruded lower lip. Two phase orthodontic treatment plan was established, first phase started with an asymmetric maxillary expansion, with the aim of correcting the transversal plan between maxilla and mandible. The RME appliance screw was employed with activation of 2 turn of the screw once a day to achieve unilateral crossbite (Fig 2).

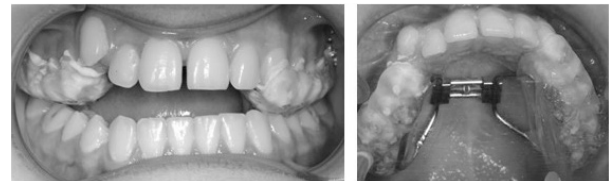


Figure 2. Appliance of Rapid maxillary expansion

The RME appliance has stabilized and remained for 6 months after expansion (fig 3).

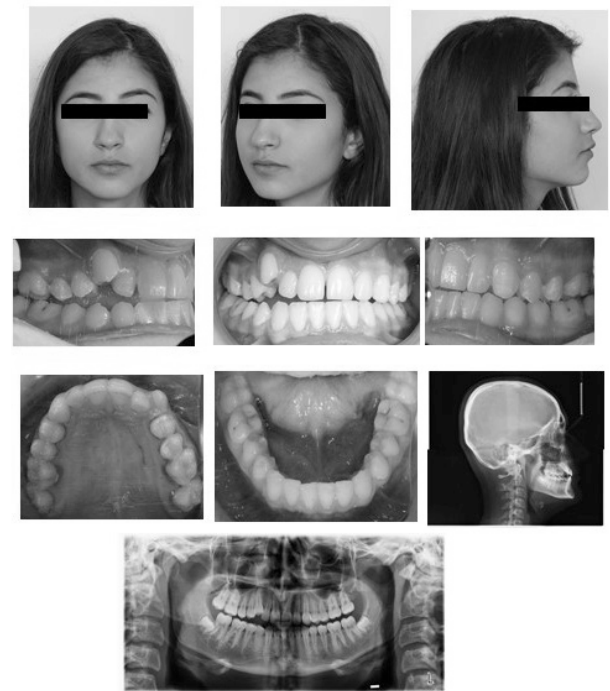


Figure 3. Facial appearance, intraoral view and radiological images of the patient after 6 months rapid maxillary expansion

After first phase expansion treatment, second phase fixed orthodontic treatment was started by applying 0.022 slot MBT straight wire metal brackets to the lower and upper teeth. Both jaws were passed to 0.019×0.025 stainless steel arches in 8 months. Class I molar and canine relationship were also achieved with class II elastics. After reaching the goals of orthodontic

treatment, the finishing phase was started, the fixed orthodontic device was removed and the retention phase started (Fig 4).

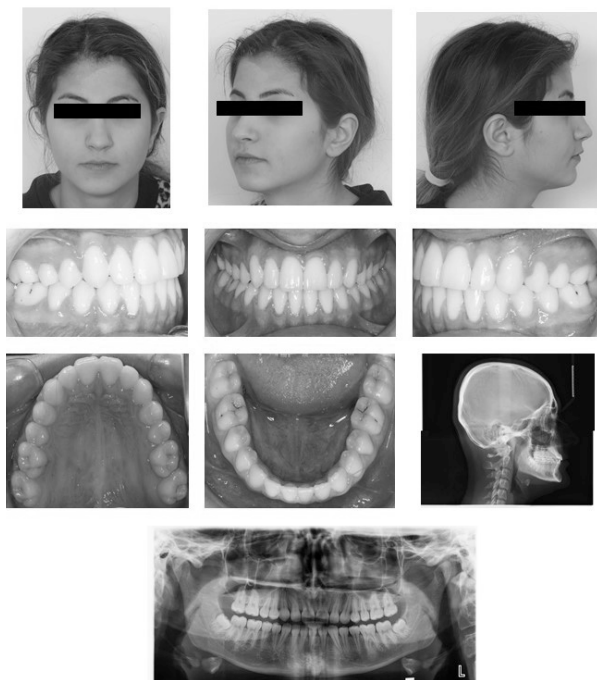


Figure 4. Facial appearance, intraoral view and radiological images of the patient after reaching the goals of orthodontic treatment and start of the retention phase.

Fixed lingual retainers were bonded canine to canine on upper and lower arch. Essix retainer plate were applied to upper arch. After 15 months of total orthodontic treatment, bilateral dental Angle Class I relationships with normal overbite and overjet has been achieved with a good occlusion.

DISCUSSION

Unilateral posterior crossbite has challenging problem to treat. There are several options for treating crossbite malocclusions e.g. banded and bonded maxillary expanders depending on individuals age and growth pattern. RME is

most common used appliance for many years and well documented in the literature (9, 10). Brin et al. showed that conventional maxillary expanders have bilateral effects (13). Marshall et al. advised maxillary expanders into the acrylic (14). This case report showed that asymmetric maxillary expansion can be produced with a modified rapid maxillary expansion procedure with locked mechanism without creating buccal nonocclusion and expansion was achieved in the crossbite side using the lock mechanism in RME. The reduction of the anterior open bite caused by the extruded posterior teeth, which is one of the negative effects of RME, was low due to the effect of the locking mechanism (12, 13, 15). Comparison of pre and post treatment lateral cephalometric analysis showed that vertical dimensions were slightly affected. Comparison of pre and post treatment lateral cephalometric analysis showed that FMA, SN-GoGn increased 1.9° and 2.1° respectively (Table 1).

Table 1. Change of Cephalometric Measurements

Measurements	Norm	T1	T2
SNA	82±2	82	83.4
SNB	80±2	79.6	81.2
ANB	2±2	2.4	2.2
N-A	0±3	2.6	2.9
N-Pg	-4±5	-4	-4.3
SN-GoGn	32±7	32.9	85
FMA	25±5	24	25.9

CONCLUSION

The result of this case report demonstrates that skeletal unilateral crossbite malocclusion can be successfully corrected with the help of asymmetric rapid maxillary expansion appliance. It also creates better asymmetric orthopaedic outcomes of upper arch for

adolescent subjects. It is very important that cases are carefully diagnosed by the orthodontist, as each case is different from each other due to skeletal and dental problems. The application of knowledge and skills with good patient collaboration ensures long-term stable results.

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