

# Treatment of Maxillary Midline Diastema Using Removable Clear Trays and Elastics: A Case Report

## *Maksiller Orta Hat Diastemasının Hareketli Şeffaf Plak ve Elastikler Kullanılarak Tedavisi: Olgu Sunumu*

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### Abstract

Maxillary midline diastema is a common esthetic problem requiring treatment. This case presentation shows the treatment of a patient with a minor midline diastema using removable clear trays and elastics. A 20-year-old female patient, whose chief complaint was a small diastema between upper central incisors, had a symmetric face and competent lips. Intraoral examination showed class 1 buccal segments relationship with normal overjet and overbite. For the closure of midline diastema, an upper clear tray was fabricated and it was sectioned at the mesial third of each central incisor to create separate left and right trays with attachments for the elastic wear. Two months later, maxillary midline diastema was totally closed and a bonded maxillary 3-3 retainer was placed for retention. The esthetic problem was resolved. Clear appliance is aesthetic, and sufficient to close maxillary midline diastema.

### Keywords

Maxillary midline diastema, class 1 malocclusion, clear tray

### Anahtar Kelimeler

Maksiller orta hat diasteması, sınıf 1 maloklüzyon, şeffaf plak

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### Öz

Maksilladaki orta hat diasteması tedavi gerektiren yaygın bir estetik problemdir. Bu olgu sunumunda minör üst orta hat diastemasının hareketli şeffaf plak ve elastikler kullanılarak tedavi edilme süreci anlatılmaktadır. Üst santral kesici dişleri arasındaki küçük diastemadan şikayetçi 20 yaşındaki kadın hasta simetrik bir yüze ve yeterli dudak kapanışına sahipti. Ağız içi muayenesinde sınıf 1 dişsel ilişki, normal overjet ve overbite ilişkisi görüldü. Diastemanın kapatılması amacıyla hastadan alınan ölçü üzerinde, orta hattan 2 parçaya ayrılmış ve kaninler bölgesinde elastik kullanılması amacıyla birer adet çıkıntısı olan şeffaf plak hazırlandı. İki ayın sonunda diastema tamamen kapatıldı ve retansiyon amacıyla üst 3-3 lingual retainer yerleştirildi. Estetik problem giderildi. Şeffaf apareyler estetik ve maksiller orta hat diastemasının kapatılmasında başarıyla kullanılabilir.

### Introduction

Maxillary midline diastema has been defined as a space or gap between two central incisors (1) and it may compromise smile attractiveness and dentofacial harmony (2). Patients generally demand the treatment of midline diastema for esthetic and psychological purposes, instead of functional reasons (3). Treatment of maxillary



Figure 1. Initial facial photographs

midline diastema can be accomplished with prosthetic rehabilitation (4,5) which involves enlargement of the central incisors (depending on their size and shape) or using fixed or removable appliances (6-8).

This case presentation shows the treatment of a patient with a minor maxillary midline diastema using removable appliances and elastics.

### Case Report

The 20-year-old female patient's chief complaint was a small gap between upper central incisors. She had a symmetric face, competent lips and average smile line (Figure 1). The upper and lower dental



Figure 2. Initial intraoral photographs



Figure 3. Initial clear tray wear with elastic



Figure 4. Four weeks after clear tray wear, before proximal enamel reduction



Figure 5. Final intraoral photographs



**Figure 6.** Final facial photographs

midlines were coincident with the facial midline. The patient had a slightly increased overjet and normal overbite, and class 1 molar and canine relationships on both sides. The Bolton (9) tooth size analysis showed 1 mm upper anterior excess (Figure 2).

Treatment objectives were to close diastema and maintain class 1 canine/molar relationship bilaterally during treatment. The diastema was small and the patient did not want fixed orthodontic treatment, and initial lateral cephalometric film was not taken. Therefore, a clear device was fabricated to close the diastema. Informed consent was obtained from the patient. A 0.040-in polyethylene terephthalate copolyester thermoplastic sheet (Raintree Essix, Inc., 4001 Division St, Metairie, LA-USA) was used to fabricate a tray over the maxillary dental plaster model of the patient's teeth on a vacuum-forming unit (7). The tray was trimmed in the vestibular and lingual surfaces of the teeth, avoiding the gingival margins (Figure 3). The tray was then sectioned in half in the midline to create separate the right and left trays. Two bondable buttons were then attached to the region corresponding to the center of the vestibular surface of the maxillary canine tooth in each half of the tray. An elastic (1/4", 4.5 oz) was then used between these buttons in the vestibular surface (Figures 3, 4). The patient was asked to wear the trays with the elastic full-time except during meals. Diastema was closed after 4 weeks and no remaining space was left (Figure 4). Mesial surfaces of the upper central incisors were wider in the middle and cervical regions than in the incisal region. The upper central incisors were reshaped by reducing the maxillary central incisors 1 mm mesially from the middle and cervical regions and the patient was asked to continue wear the trays with

the elastic. After closure of diastema, upper canine-to-canine fixed lingual retainer was placed for retention.

The total treatment period was 2 months. The final intraoral photographs showed that dental relationship was preserved and diastema was closed (Figure 5). The final facial photographs displayed an attractive smile with a pleasing smile arc (Figure 6). The patient was pleased with her teeth and the treatment results.

## Discussion

Maxillary midline diastema is usually normal after the eruption of maxillary central incisors. It has been stated that when the remaining teeth erupt by 16 years of age, 83% of the maxillary midline diastemas disappear spontaneously (10). Several etiologic factors linked to the lack of physiologic closure of the maxillary midline diastema include problems with horizontal and vertical positions of the anterior teeth (11), oral habits like digital sucking and tongue position (6), generalized spacing due to tooth size and available arch length discrepancy (12), and thick labial frenum (10).

It has been suggested that relapse might occur after treatment of small initial diastema (13) and measures must be taken to avoid relapse. For our patient, a bonded upper 3-3 lingual retainer was placed for stability and retention. Bonded lingual retainers are easily accepted by patients and are not dependent of patient cooperation (14,15).

When a patient does not want fixed orthodontic treatment to close small diastema, clear tray used in this case is esthetic, comfortable, almost undetectable and, easily accepted by the patient.

The appliance presented in this case report is aesthetic, convenient for the patient, and sufficient to close maxillary midline diastema, particularly when the patient does not want fixed orthodontic treatment.

## Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

## Authorship Contributions

Surgical and Medical Practices: S.Ş., Concept: K.B, S.Ş., Y.A., Design: K.B, S.Ş., Y.A., Data Collection or Processing: K.B, S.Ş., Y.A., Analysis or Interpretation: K.B, S.Ş., Y.A., Literature Search: K.B, S.Ş., Y.A., Writing: K.B.

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