

# Dilemma of Midline Diastema: A Case Report

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## Abstract:

Midline Diastema is a well defined multifactorial clinical entity with several treatment options available for correction. This case report describe orthodontic approach towards correction of midline diastema. In these cases Retention planning plays an important role for the long term stability of the achieved goals.

**Keywords:** Midline diastema , Bonded appliance, Bonded Retainer, Retention.

## Introduction

There are many etiological factors in the development of a median diastema and most have been investigated to some degree. These factors include Physiological (ugly-duckling stage), Anodontia, tooth-size discrepancy, supernumerary teeth or high frenum attachment.<sup>1,2</sup> Midline diastema (or diastemas) occur in approximately 98% of 6 year olds, 49% of 11 year olds and 7% of 12–18 year olds.<sup>3</sup>

There have also recently been reports of self-inflicted pathological cases of diastema caused by tongue piercing. In many of these cases, orthodontic treatment alone can help close a diastema. Adjunctive orthodontic treatment in association with restorative and oral surgery techniques are recommended in diastemas associated with tooth size discrepancies, supernumerary teeth and high labial frenum.<sup>4,5</sup>

## Case Report

A 23 year old female presented with the complain of a large unesthetic space between

her upper front teeth. Complete clinical examination was performed, including intraoral and extraoral photographs and a review of periodontal status. The patient had class I skeletal base and average vertical facial proportion and competent lips. Molar relationship were recorded class I on both left and right side. Oral hygiene was good.

There was a spacing of 3-4 mm between maxillary central incisors. After explaining all treatment options (Direct composite restorations, All ceramic crowns and fix orthodontic treatment) patient opted for fix orthodontic treatment. Debonding of bonded appliance was undertaken twelve months after fixed appliance therapy began.

Following placement of full bonded appliance (0.022 preadjusted brackets) and initial levelling and alignment the diastema was closed using medium elastic power chain on 0.016 round stainless steel archwire. The orthodontic treatment was progressed as anticipated. The resulting final occlusion was retained with palatally bonded multistranded

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stainless steel wire retainer.



**Fig. 1 :** Pre-treatment intraoral photograph



**Fig. 2 :** Mid treatment with bonded appliance in place



**Fig. 3 :** Post treatment photograph



**Fig. 4 :** Palatal bonded retainer in place

### Discussion

When a treatment approach of a maxillary midline diastema is to be implemented, the first and probably most important stage of treatment is the diagnosis of the cause of the

problem. The dentist should evaluate several parameters to reach a sound diagnosis, which includes chronological and dental age of the patient, associated malocclusion, tooth size discrepancy, presence of abnormal oral habit and any underlying pathology.

When the diagnosis is established, the appropriate therapy should include management of the causative factors, along with the diastema correction and the permanent retention of the result. This is the only way to fully satisfy the patient's needs and maintain long-term stable results.

As a general guideline, only maxillary midline diastema exceeding 2 mm are unlikely to close spontaneously following the eruption of permanent lateral incisors and canines, while an initial diastema less than 2 mm hardly ever remains.<sup>5</sup> Therefore, the treatment of the maxillary midline diastema is usually postponed until the eruption of the permanent canines, but it may start earlier, depending on the cause of the diastema or in cases with a relatively large diastema. The treatment of the maxillary midline diastema may start before the eruption of permanent canines in cases where the diastema is due to congenitally missing lateral incisors, the presence of a mesiodens, odontoma or other pathology in the midline, or small teeth. Main indications for early closure of a maxillary midline diastema, i.e. during the stage of mixed dentition, (a) an urgent aesthetic demand by the patient and (b) a central incisor position that inhibits the eruption of the lateral incisors or canines, since the lateral incisors might have been displaced into the space where canines normally erupts.<sup>6</sup>

Retaining the result of treatment is a particularly difficult issue, especially if lateral incisors and canines have not yet erupted.

For diastema closure of more than 2 mm the bodily movement of adjacent teeth with fix appliances is required. Prognosis in such cases is better when only mesiodistal and not palatal repositioning is required. It should always be kept in mind that when tipping takes place, it usually results in diastema relapse therefore it is indispensable to apply permanent retention.<sup>7</sup>

In some cases, closure of a maxillary midline diastema or other diastemas in the maxillary anterior region may be achieved with minimal preparation veneers or through teeth restorations with composite resin. However, the long-term prognosis of these therapeutic approaches must be further investigated. In particular, the cases where these options can be performed are when:

- a) The patient does not want to undergo orthodontic treatment,
- b) There are other aesthetic problems present as well (e.g. amelogenesis imperfecta or discoloration), and
- c) Treatment requires combined orthodontic and restorative treatment, in cases with a very large diastema.

### Retention of the Result

The reason for relapse in patients with midline diastema is the placement of teeth in a position where no equilibrium exists with their functional environment.<sup>8</sup> In most of these cases, the factor disturbing this equilibrium is still present after treatment.

Shashua and Artun (1999)<sup>8</sup> concluded that the most important risk factors for relapse are the increased pretreatment width of the midline diastema, the presence of a family member with a similar condition, and the presence of more than one diastema in the maxillary anterior region.

In general, orthodontic closure of diastema is likely to relapse after treatment therefore permanent retention for long duration or even for life is usually recommended.

Long term retention to prevent relapse in these cases is usually provided by the palatally bonded multistranded stainless steel wire.<sup>9</sup> These multistrand wires are easy to bond and maintain the physiological mobility of bonded teeth.

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