

Orthodontic correction of maxillary midline diastema: A case report

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Abstract

Maxillary midline diastemas are one of the most commonly encountered complaints in the field of orthodontia. It has been defined as anterior midline spacing between the two central incisors. This paper describes a case report of a 30 years old female patient reported at the department of orthodontics & dentofacial orthopedics complaining of increasing gap between upper front teeth. Clinical examination revealed 4mm of midline diastema between maxillary central incisors and proclined upper & lower anterior. Fixed mechanotherapy was planned and after initial levelling & alignment, the

diastema was closed with the help of elastomeric chain. A successful result has been achieved after 9 months of treatment. Proper planning & execution is the key to successful treatment.

Keywords: Midline diastema, Orthodontic, maxillary central incisor, elastomeric chain.

Introduction

A space between adjacent teeth is called a diastema. The etiology of midline diastema is multifactorial. It can be due to normal developing dentition involving ethnic or familial tendency or it can be due to tooth material deficiency(Microdontia). Physical impediment like

mesiodens, retained deciduous tooth, abnormal labial frenum can also be responsible for midline diastema. Persistent habits like thumb sucking, tongue thrusting also plays a major role in the etiology of midline diastema.

Physiological midline diastema which is also called ugly duckling stage is a transient or self-correcting malocclusion which is seen in maxillary incisor region between 8-9 years. It is particularly seen during eruption of maxillary canines. During eruption the permanent canines displace the root of the lateral incisors mesially & as a result there will be divergence of the crowns of central incisors causing a midline spacing. Broadband described it as ugly duckling stage because the children look ugly during this phase due to spacing between teeth. It is a self-correcting anomaly.

Prolonged thumb sucking or tongue thrusting leads to midline diastema. The intensity, duration & frequency of habit are three main factors for causing the diastema.

Some iatrogenic causes like Rapid maxillary expansion & Milwaukee braces can also cause midline diastema.

Case Report

A 30-year-old female patient came to Department of Orthodontics and Dentofacial Orthopedics, Dr. R. Ahmed Dental College & Hospital complaining of increasing gap between upper front tooth. On Extraoral examination she was found to have mesoprosopic facial form with straight profile with competent lips having 1mm of inter-labial distance. Intraorally there is a gap of 5 mm between upper central incisors, overjet & overbite of 5 mm and proclined upper anterior.

Lateral cephalogram analysis shows patient is having class I skeletal base with average growth pattern, proclined upper and lower incisors. Soft tissue analysis shows upper & lower lips are normal in position.



Fig 1: Pre-treatment Orthopantomogram



Pretreatment Lateral cephalogram



Fig 2: Extraoral pretreatment photographs



Fig. 3: Intraoral pretreatment photographs

Diagnosis

A 30-year-old female non growing patient with Angle's class I molar relation on class I skeletal base with average growth pattern, straight profile. Patient is having midline diastema in the upper arch and spacing & proclination in the lower arch.

Treatment objectives

1. Proper levelling and alignment of both maxillary and mandibular arch.
2. Closure of midline diastema in the upper arch and spacing in the lower arch.
3. To correct the inclination of the mandibular anterior teeth.
4. To maintain class I molar and class I canine relationship.

Treatment plan

The patient was planned to be treated with a non-extraction approach.

Treatment Progress:

Patient was treated with fixed mechanotherapy using Pre-Adjusted Edgewise MBT 022 Slot Brackets, to

achieve proper alignment and levelling of the maxillary and mandibular arch.

In both maxillary & mandibular arch, alignment and leveling were achieved with a sequence of 0.014- and 0.018-in nickel-titanium arch wires, later replaced by rectangular nickel-titanium arch wires (0.017 X0.025 and rigid stabilizing wire(.019X.025) elastomeric chain was the another side of the arch to close the space. First the space in the mandibular arch was closed followed by the maxillary arch.

Fixed lingual retainer was given in both maxillary & mandibular arch to prevent relapse.

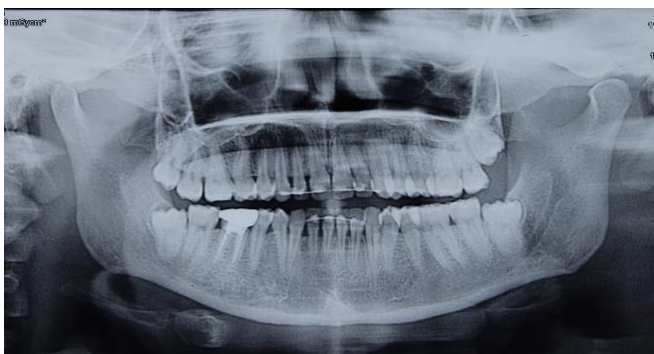
Treatment results

Midline diastema was closed and the spacing and proclination in the mandibular arch was also corrected. Bilateral Class I molar, canine and incisal relationships were achieved with ideal overjet and overbite.





Fig 4: Post treatment extra & intraoral Photographs



Post treatment OPG & Lateral cephalogram

Discussion

Maxillary midline diastemas are one of the most common problems encountered in orthodontic problem. The etiology of midline diastema can be variable. It can be due to physiologic causes or due to persistent habit or physiologic impediment like midline diastema, high labial frenum or maybe due to racial or familial predisposition. etc. The treatment plan depends on the etiology.

In this case the cause of the patient gave a history of familial predisposition. So, after proper levelling & alignment the space was closed with E-chain I both the arches and fixed bonded retainer was given to prevent relapse.

Parameter	Pre treatment	Post treatment
SNA	80°	78°
SNB	78°	76°
ANB	2°	2°
Wit's Appraisal	1mm	1mm
Upper CI to NA (linear/angular)	09mm/31°	07mm/29°
Lower CI to NB (linear/angular)	07 mm/31°	5mm/28°
IMPA (Tweed)	100°	96°
FMA	23°	20°
Y (growth) axis	60°	59°
Jarabak's ratio	67%	67%
Ricket's E line U/L	- 4mm/-2 mm	-4.5mm/- 2.5mm

Pre and Post Treatment cephalometric comparison

Conclusion

Due to aesthetic concern maxillary midline diastema is one of the commonest forms of malocclusion that we encounter in routine orthodontic practice. Not only the treatment but the retention of the treatment is the main challenge to the orthodontist. So permanent retention should be given and removal of the etiological factor should be done to prevent relapse.

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