

**Case Report**

## Closure of Midline Diastema Through Combined Periodontal Surgery and Fixed Orthodontic Approach

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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 midline diastema using combination of both fixed orthodontic mechanotherapy and frenectomy procedure. A 16-year-old male patient, whose chief complaint was a small diastema between upper central incisors, had a symmetric face and competent lips. Intraoral examination showed class 1 molar relationship buccal segments relationship with normal overjet and overbite. For the closure of midline diastema, here we use frenectomy with fixed orthodontic appliances.

**Key words:** Fixed orthodontic, Midline diastema, periodontal surgery.

### Introduction

Maxillary anterior spacing or diastema is a common aesthetic complaint of patients or parents and is frequently seen in the mixed and permanent dentition stage. Keene described midline diastema as anterior midline spacing greater than 0.5 mm between the proximal surfaces of adjacent teeth. He reported that the incidences of maxillary and mandibular midline diastema are 14.8% and 1.6%, respectively.<sup>1</sup> Maxilla had a higher prevalence of midline diastema than the mandible.<sup>2</sup> Angle concluded the presence of abnormal frenum as the cause for midline diastema and this view was supported by other researches.<sup>3-6</sup> Weber listed the causes for spacing between the maxillary incisors as: A result of high frenum

attachment; microdontia; macrognathia; supernumerary teeth; peg laterals; missing lateral incisors; midline cysts and habits such as thumb sucking, mouth-breathing and tongue-thrusting.<sup>7</sup> Here, a case of spontaneous closure of midline diastema after frenectomy with fixed orthodontic appliances is presented.

### Case report

#### Diagnosis

An 16-year-old boy reported to the Department of Orthodontics of Guru Nanak Institute of Dental Sciences & Research with chief complaint of a small gap between upper central incisors. Figure 1 showing pretreatment extraoral and intraoral

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photographs and lateral cephalogram with OPG. He had a symmetric face, competent lips and average smile line. Patient's medical history did not reveal any systemic diseases. Intra-oral periodical radiograph was taken to find out the cause of diastema and to rule out the presence of any unerupted mesiodens. On intraoral examination revealed presence of high frenal attachment and midline spacing between maxillary central incisors (7 mm). The patient had a slightly increased overjet and normal overbite, and class I molar and canine relationship on both sides. The treatment objective was closure of midline diastema and spacing of lower anterior teeth to improve facial esthetics to achieve a balanced smile. The treatment plan was Space closure by continuous arch mechanics in both upper and lower arch. maxillary frenum removal by frenectomy. Preadjusted edgewise appliances 0.022×0.028 slot (MBT prescription) was bonded to the maxillary and mandibular arches. Initial leveling and alignment was carried out by 0.016 inch HANT wire, then 0.018 AJ Willcock wire, followed by rectangular 0.019×0.025 Niti . Both the arches were prepared for retraction with posted 0.019×0.025 stainless steel wire. In upper & lower arch en mass retraction was carried out by using continuous arch mechanics. After obtaining informed written consent from the parents,

decision was made to remove high frenal attachment by a surgical technique Frenectomy was carried out under local anesthesia with incision using No. 11 Bard Parker blade. In this technique, lateral incisions were made on either side of the frenum to the depth of the underlying bone. Sutures were placed to identify the free tissue margins on either side of the removed tissue and periodontal pack was placed for a week. Patient was advised to return after a week for suture removal and periodical follow-up once a month. Patient was followed-up for a period of 4 months, at the end a remarkable improvement in the aesthetics was observed due to spontaneous closure of midline diastema. Sutures were placed for a Suture was placed for a week. The patient was advised to return after a week for suture removal and finger springs appliance with anterior bite plane was delivered and periodic follow-up advised. After all space closure final settling was done by using 0.014 inch Niti was used for both upper and lower arch with 'w' pattern elastics. The treatment result was at the end of treatment, proper class I molar and canine relation & optimum overjet and overbite both were established in this case. Closure of midline diastema and consonant smile was established. Overall, post treatment results showed significant improvement in facial and smile esthetics. Post treatment

**Table 1:** Pre and post treatment cephalometric values

Measurement	Pre treatment	Post treatment
SNA	85°	85°
SNB	82°	82°
ANB	3°	3°
FMA (°)	23°	22°
Jarabak's ratio (%)	70%	68%
Lower 1 to N-B (mm.)	8 mm	7 mm
Upper 1 to N-A(mm)	7 mm	5 mm
IMPA	99°	95°
Wits- appraisal(Ao-Bo)	3mm	2mm



**Figure 1:** Pre treatment extraoral and intraoral photographs and OPG lateral cephalogram

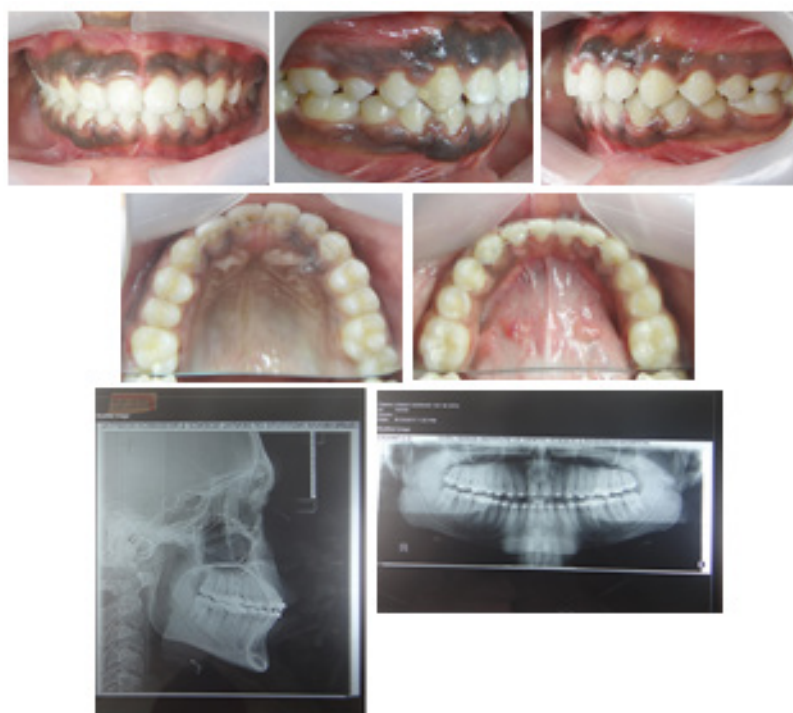
extraoral [Figure 2] and intraoral photographs and lateral cephalogram with OPG showing Figure 3. Post treatment OPG showed proper root alignment with no root resorption and lateral cephalogram showed marked changes in values (minimum skeletal & maximum dento-alveolar). Overall superimposition of cephalometric tracing showed reduce inclination of upper incisors with little skeletal changes.

## 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.<sup>8</sup> It has been suggested that relapse might occur after treatment of small initial diastema.<sup>9</sup>



**Figure 2:** Post treatment extraoral photographs



**Figure 3:** Post treatment intraoral photographs and OPG and lateral cephalogram

admeasures must be taken to avoid relapse. Bonded lingual retainers are easily accepted by patients and are nondependent of patient cooperation.<sup>10,11</sup> In general; abnormal frenal attachment may require removal either before orthodontic treatment or at the end of active treatment. The advantage of excision prior to orthodontic treatment is the ease of surgical access. If the surgery is performed before the orthodontic procedure, the scar

tissue might impede the closure of diastema, but the noted advantages of excision after orthodontic tooth movement is the scar tissue formation, which helps to maintain closure of diastema. Spilka and Mathews stated that in spite of the success and excellent results, orthodontists have a problem in correcting dental abnormalities, one particular area, which lends itself to relapse, is the diastema between the incisors.<sup>12</sup>

## Conclusion

The present case report showed the presence of a thick frenum in the maxillary arch, causing midline diastema and aesthetic problem in the patient. diagnosis followed by the management of a mesiodens improves smile esthetic of the patient which make better to perform social smile.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed. Financial support and sponsorship was nil. There are no conflicts of interest.

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