‘M’ Mechanics for the Management of Maxillary Midline Diastema

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ABSTRACT

Maxillary midline diastema (MMD) is a relatively common dental malocclusion characterized by a space between the maxillary central incisors, with functional and esthetic consequences. Based on the linear measurement of a diastema, a wide range of prevalence values has been reported—from 1.6 to 25.4% in adult populations, and even higher in younger groups.1-3 The literature strongly supports racial differences in the distribution of the trait, with blacks demonstrating consistently higher prevalence values than whites, Asians or Hispanics.2,6

Numerous etiologies have been proposed for MMD, including tooth size or jaw size discrepancies, aberrant labial frenum attachments, parafunctional habits, tooth loss, periodontal disease, deep bites, and maxillary midline pathologies, such as supernumerary tooth.4-8 There have been reports of self-inflicted pathological cases of diastema caused by tongue piercing.5

The treatment include identification and removal of etiologic factor followed by various modalities, such as orthodontic tooth movement, restorative procedures with esthetic composite, prosthetic management of space with porcelain jacket crowns, laminates.

MATERIALS AND METHODS

This article presents a case report in which the midline diastema was managed with simple M shaped sectional archwire mechanics.

A 16-year-old female patient presented with supernumerary tooth between the upper central incisors (Figs 1 and 2). After extraction of the supernumerary tooth maxillary midline diastema of size 3 mm was evident.

Treatment Objective

Patient was reluctant for complete orthodontic treatment and severity of malocclusion according to IOTN was mild (Grade 2). So management of midline diastema only was the prime focus.

Method

Diagnostic records were made. The treatment was initiated by bonding two preadjusted edgewise brackets 0.022” × 0.028” MBT prescription on the labial surfaces of upper central incisors. The M coil spring was fabricated initially with 0.016” round Australian orthodontic premium grade wire as shown in the Figure 3.

M spring was designed with 3 round loops of diameter 3 to 4 mm, one at the center and two at the periphery. Care was taken so that it should not interfere the labial sulcus and other soft tissues. The spring was activated as shown in Figures 4A and B. After activating spring, it was ligated to the brackets. The Figure 4B shows the direction of forces generated. Round
archwire allowed free tipping of the incisors and the space was closed.

The roots of the maxillary incisors were divergent at the end of tipping. To upright the roots the spring was refabricated with the same design with 0.016” × 0.022” stainless steel rectangular archwire for the better torque control and root parallelism. The activation was done as shown previously.

After the uprighting of the roots 0.019” × 0.025” segmented stainless steel archwire was tightly ligated for a month to assist for the better torque control (Table 1).

### Table 1: Torque expression

<table>
<thead>
<tr>
<th>Archwire</th>
<th>0.016” × 0.22” SS</th>
<th>0.019” × 0.025” SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper incisor to NA</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>(angle in degrees)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper incisor to NA</td>
<td>5 mm</td>
<td>4.5 mm</td>
</tr>
<tr>
<td>(linear distance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper incisor to SN</td>
<td>103</td>
<td>101</td>
</tr>
<tr>
<td>(angle in degrees)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS**

Clinically closure of diastema was evident. The overjet and overbite were average. The periapical radiograph shows almost upright roots with good contact point at the incisal two-third (Fig. 5).

**DISCUSSION**

The mechanics combined Beggs philosophy of tipping of the teeth with lighter forces with the round archwire followed by use of preadjusted edgewise mechanics for root uprighting and torque control with rectangular archwire.

The light wire technique enables teeth to be moved by being simply tipped. It does not cause pain, does not damage tooth roots or tooth investing tissues while preadjusted edgewise brackets with rectangular wires controls the torque and root uprighting.9,10

The time required for closure of diastema with tipping was about 2 months. The 0.016” × 0.022” stainless steel wire and 0.019” × 0.025” stainless steel wire were ligated, each for 1 month. Total treatment duration was 4 months. The mechanics
is definitely time saving as compared to treatment solely with either light wire technique; which may need different auxiliaries for control of root position; or preadjusted edgewise technique where friction is encountered, both of which may increase total treatment time.

**Treatment Progress**

The case was debonded after uprighting of the roots of both the central incisors. The fixed retainer was bonded on the lingual aspect of the two incisors. The patient was referred to prosthodontist for reshaping of incisal edge of right central incisor for better esthetics. The Figure 6 shows 2 and half years postretention stability.

**CONCLUSION**

This is a novel way of treating the case of maxillary midline diastema. It requires minimum inventory and less chairside time. Treatment duration is also reduced and the results are stable.

**REFERENCES**