A novel prefabricated palatal spring for Adjunctive orthodontic treatment of midline diastema – A clinical innovation.

Rakeshkumar Kontham[1], **Bhavika Gharat**[1]
[1]*Department of Orthodontics, Nair Hospital Dental College, Mumbai.*

Corresponding Author
Rakeshkumar Kontham
Email ID: rakesh.kontham@nairhospitaldentalcollege.edu.in

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Abstract:

Most adult patients are not very keen to undergo orthodontic treatment for midline diastema due to the protracted nature of the treatment and unacceptable aesthetics associated with conventional orthodontic appliances.

This case report describes the management of a midline diastema by an easily prefabricated 'W' spring, placed palatal to the maxillary central incisors. The diastema closed in 4 weeks with a single activation. Excellent mesiodistal and labiolingual control over teeth was observed. The 'W" spring (which can be prefabricated), is an economical, esthetic alternative to conventional orthodontic appliances and can easily be used in general dental practice for rapid closure of midline diastema.

Key words: Adult treatment, Adjunctive orthodontics, midline diastema, prefabricated spring.

Introduction:

The midline diastema is considered unaesthetic in adults, adversely affecting body image, self-esteem and is perceived to be one of the most undesirable traits in self-perceived dental appearance[(1)].

In some cases, orthodontic intervention becomes mandatory to provide optimum treatment for the patient in terms of aesthetics, function and preservation of biological tissue[(2,3,4,5)] for e.g. when midline diastema coexists with.

- Microdontia of lateral incisors.
- Reduced overjet and deep bite.

The purpose of this paper is to present an esthetic and rapid method of midline diastema closure with controlled movement of the incisors. This is achieved using a palatally placed 'W'spring, one that can easily be prefabricated.

Spring design:

The 'W' shaped spring is fabricated with an 014" stainless steel (A J Wilcock) wire with the two gingival coils being directed distolabially to resist the distopalatal rotation of the incisors. The vertical arms of the spring are adjusted to prevent mesial tipping during space closure; more the space, greater anti-tip needs to be incorporated into the spring (Fig 1).

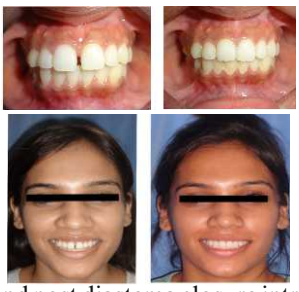
Figure.1- Spring design and anti-tip and anti-rotation activation

Clinical Application

The following case shows closure of midline diastema of 2mm with "W" spring. Begg brackets are bonded on the palatal surface of the two maxillary central incisors with the slot facing gingivally and both bracket bases being at equal distance from the incisal edge. The spring is engaged with the vertical arms passing through the brackets and the incisal ends are given a right-angle bend to lock the spring and prevent distopalatal rotation (Fig 2). The patient was recalled

Figure.2 – Pre and post diastema closure occlusal view of the spring

at 2 weekly intervals, and the midline diastema closed completely in 4 weeks in a single activation. Very mild tipping was observed, and no rotation of the teeth was seen at the end of the treatment period. (Figures 3 &4). A fixed bonded retainer was placed on the central incisors palatally.



Figures.3 – Pre and post diastema closure intraoral view
Figure.4 - Pre and Post diastema closure extra-oral view.

Discussion

Most adults seeking cosmetic treatment for spacing in the maxillary anterior teeth, especially the midline diastema, are not very keen to undergo orthodontic treatment.

Diastemas measuring 3mm or more require controlled tooth movement for space closure, hence simple elastics causing tipping movements are not considered ideal. Thermoformed appliances with elastics have been used to correct midline diastemas. Although somewhat aesthetic, these appliances may not be very comfortable and need to be removed at mealtimes[4]. Additionally, they are dependent on patient compliance to be effective.

The patient tolerated the palatal 'W' spring very well and within 4 weeks, the midline diastema of 2mm showed complete closure, by just a single activation.

Advantages of the palatal 'W' spring

- Rapid closure of diastema in a single activation.
- Good rotation and axial control of the teeth.
- Optimal aesthetics due to palatal placement of the spring.
- Economical.
- Expeditious as, it can be prefabricated by the clinician.

The spring may even be used for diastemas measuring more than 3mm as it provides excellent axial control over the teeth. In cases with deep bite, posterior bite blocks may be required to prevent damage to the spring from occlusal forces.

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Conflict of Interest: Nil

References

1. Bernabé E, Flores-Mir C. Influence of anterior occlusal characteristics on self-perceived dental appearance in young adults. Angle Orthod. 2007; 77:831-836.
2. Huang W.G, Creath, C.J: The midline diastema: A review of its etiology and treatment. Pediatr Dent.1995; 17:171-9.
3. Chu C H, Zhang C F, Jin L J. Treating a maxillary midline diastema in adult patients: A general dentist's perspective. J Am Dent Assoc.2011; 142:1258-1264.
4. Bishara S.E. Management of diastema in orthodontics. Am.J.Orthod.1972; 61:55-63.
5. Offerman RE: A diastema-closing device. J Clin Orthod. 1984;18: 430-431.