Spring mechanics for the closure 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. A diastema between the maxillary central incisors is a relatively common finding in the primary, mixed as well as permanent dentitions. In the primary dentition, interdental spaces help to settle down the superceding permanent teeth. Majority of these close spontaneously by the time the maxillary canines appear, but a few may persist in the permanent dentition. Various treatment modalities are implemented to bring about closure of the diastema. This paper presents a series of 10 cases treated for the closure of diastema with a M shaped spring fabricated chairside.

Keywords: Midline diastema, M spring, Central incisors.

Introduction
Maxillary midline diastema (MMD) which is a space between the maxillary central incisors is one of the most common dental malocclusions with functional and esthetic consequences. A diastema between the maxillary central incisors is a relatively common finding in the primary, mixed as well as permanent dentitions.[1] In the primary dentition, interdental spaces help to settle down the superceding permanent teeth. Majority of these close spontaneously by the time the maxillary canines appear, but a few may persist in the mature permanent dentition. In mixed dentition, a midline diastema often represents a normal stage of development which closes eventually with the eruption of permanent canine.[2] If the midline diastema persists post the eruption of permanent canines, etiologic factors must be taken into consideration and eliminated. Numerous etiological factors contributing to the development of midline diastema have been reported and discussed in the literature.[3-6] However there is no agreement on a single etiological factor. The prevailing view seems to consider its development as a multifactorial phenomenon.

The treatment involves identification and elimination of the etiological factors, followed by various treatment modalities such as orthodontic tooth movement, restorative procedures or prosthetic management of space.[7-9]

Materials and Methods
This article presents a series of 10 cases with maxillary midline diastema treated with a simple M shaped sectional mechanics fabricated chairside.

10 patients between the ages 17-30 years coming to the department of Orthodontics and Dentofacial Orthopaedics of our institute with the chief complaint of maxillary midline diastema were included in the study. Diagnostic records including study models, intra-oral photographs and intra-oral periapical radiographs with the upper central incisors were taken before the treatment. The upper central incisors were bonded using MBT 0.018X0.022 prescription. The spring was then fabricated chairside using 0.016 round Australian orthodontic premium grade wire.

Fig. 1:

Spring consisted of three coils, each 3 mm in diameter, one at the centre and two at the periphery giving it an appearance of the alphabet 'M', hence the name (Fig. 1). The spring was ligated away from the soft tissues so as not to create any injury. It was activated by pulling the two vertical arms and ligating with the incisor brackets. (Fig. 2)

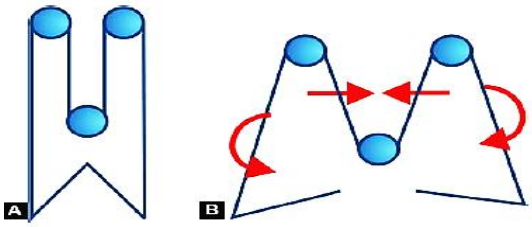

Fig. 2:

Results

Midline diastema closure was achieved at the end of 3 months during which activation of the M spring was done after every 3 weeks. (Fig. 3)

Fig. 3: A-pretreatment, B-with M spring, C-final outcome

Discussion

The M spring mechanics made use of the Begg's philosophy. It intented to tip the maxillary central incisors towards the midline with lighter forces using round archwires. The light wire technique enables teeth to be moved by simply being tipped.[10] It does not cause tooth pain, damage to the tooth structure or to the investing structures. Time required for closure of diastema with M spring was 3 months. Activation was done after three weeks during which the two vertical arms of the spring were pulled apart and it was re-inserted and ligated. No patient complained of any tissue irritation during the course of treatment.

Treatment Progress

Debonding procedures were carried out after the complete closure of maxillary midline diastema. Patients were then referred to the department of prosthodontics and endodontics for esthetic rehabilitation with the upper centrals and lateral incisors.

Conclusion

This treatment modality of incorporating M spring can perhaps be an innovative way of treating maxillary midline diastema. It requires minimum inventory for the fabrication and also lessens the chairside time which is beneficial for both the patient as well as the practionter.

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