

Clinical Utilization of M Spring for the Space Closure of Midline Diastema – Clinical Case Reports

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ABSTRACT

People approach orthodontist mainly for aesthetic purpose, midline diastema is one of the condition which causes aesthetic compromise. The midline diastema can be caused by various reasons such as high frenal attachment, midline pathology, etc. In the field of orthodontics, relapse rate is high while treating midline diastema. This relapse can be reduced only when there is bodily movement of the incisors in mesial direction. In this article, two cases of midline diastema are selected. Both the cases were treated using “M” spring which has three coils; two at periphery and one at the center and each coil was of 3mm diameter. “M” spring was fabricated using round 0.018” AJ Wilcock wire for one case and 0.017 X 0.025 TMA for another case. For both cases the duration of treatment was for six weeks. IOPA was taken after six weeks, the case in which rectangular wire was used; there was bodily movement of the central incisor in mesial direction. Whereas in round wire technique, predominantly tipping type of tooth movement was seen. The rectangular wire has two point contacts, because of which bodily movement was obtained. This technique of using rectangular wire to fabricate “M” spring has less inventory and chair side time.

Keywords: Bodily tooth movement, Round wire, Rectangular wire, Tipping tooth movement

CASE REPORT

Two patients reported to the Department of Orthodontics with the chief complaint of spacing in the upper front teeth.

Case I

On extra oral examination the patient had a straight profile and mesocephalic head type and mesoprosopic facial type with incompetent lips.

Intraoral examination revealed midline spacing of 3mm in relation to 11 and 21 with Angle’s class I molar relation on both left and right side, Class I canine relation on both left and right side, overjet of 4mm and overbite of 4mm.

Diagnosis: Angle’s Class I malocclusion on class I skeletal base with midline diastema [Table/Fig-1,2].

Treatment objective for this case was to close the mid line spacing maintaining class I molar relation and class I canine relationship.



[Table/Fig-1]: Case 1 pre treatment photograph.
[Table/Fig-2]: M spring pre activated.

Case II

On extra oral examination the patient had a straight profile and mesocephalic head type and mesoprosopic facial type with incompetent lips.

Intraoral examination revealed midline spacing of 8mm in relation to 11 and 21 with Angle’s class I molar relation on both left and right side, Class I canine relation on both left and right side, overjet of 7mm and overbite of 4mm.

Diagnosis: Angle’s Class I malocclusion on class I skeletal base with midline diastema. [Table/Fig-3,4].

Treatment objective for this case was to close the mid line spacing maintaining class I molar relation and class I canine relationship.



[Table/Fig-3]: Case 2 pre treatment photograph. [Table/Fig-4]: M spring activated.

TREATMENT PLANNING

Complete oral prophylaxis was done for both the cases. Teeth were etched with 37% phosphoric acid. McLaughlin Bennett Trevisi (MBT) 022 slot brackets were bonded using transbond composite resin. MBT bracket positioning gauge was used to position the bracket. MBT chart was used for the placement of the bracket. The brackets were cured for 20 seconds using LED light cure. Non extraction treatment plan was decided for both the cases. Initial aligning phase of treatment was completed using sequence of nickel titanium wire. Midline space closure was decided to be done using “M” spring.

“M” SPRING

This spring was fabricated in the shape of “M” which contains three helices, two helices at the periphery and one at the centre. The helix was fabricated with the diameter of 3mm [1]. The active arm (which has to be placed in the slot) is bent at 45° inward, such that during activation the active arm rests completely at the bracket slot [Table/Fig-1-4].

In Case I A J Wilcock stainless steel 0.018” wire was used to fabricate “M” spring.

In Case II "M" spring was fabricated with 0.017 X 0.025 TMA wire.

In both the cases, "M" spring was stretched and it was placed in the brackets. The treatment duration was for six weeks. After six weeks, IOPA was taken for the central incisors to check for space closure and root paralleling.

TREATMENT PROGRESS

Case I: Midline diastema was closed with the use of "M" spring within the duration of six weeks [Table/Fig-5]. IOPA revealed tipping movement of incisors towards each other with round A J Wilcock wire [Table/Fig-6].

Case II: Using rectangular wire the midline space reduced from 8mm to 3mm within the duration of three weeks [Table/Fig-7]. IOPA revealed bodily movement of the incisors in mesial direction and root parallelism was achieved with the use of rectangular wire [Table/Fig-8].



[Table/Fig-5]: Case 1 post treatment photograph. [Table/Fig-6]: Case 1 IOPA.



[Table/Fig-7]: Case 2 post treatment photograph. [Table/Fig-8]: Case 2 IOPA.

DISCUSSION

Young adults are more concerned about their aesthetics. Aesthetics is compromised in patients with midline diastema. Maxillary midline diastema is a common dental malocclusion characterized by a space between the central incisors. Numerous etiologic factors such as tooth material and jaw size discrepancies, aberrant labial frenum attachments, habits, congenitally missing lateral incisors, midline pathologies, peg laterals, etc., [1-4] have been reported for midline diastema. Orthodontists usually

encounter the challenges with relapse after treating midline diastema. Various metals play a major role in treating cases of midline diastema in orthodontics. These metals are being used to produce natural aesthetic smile in human beings. Metals used vary with their property and cross section. Depending on the properties and dimension of the wire, wire has to be decided prior to the treatment to control the relapse. This article describes two cases treated with "M" spring with different types of cross sectional wire for midline diastema.

Midline diastema refers to spaces seen between two central incisors. There are many techniques available in the field of orthodontics to close the midline space using various materials; most of the techniques have resulted in relapse. Various materials to close the midline space are closed coil spring, E- Chain, different types of wire, wires with different cross sections, etc., [5,6]. Comparing the above mentioned two cases, bodily movement of the central incisors in mesial direction using rectangular wire has a better tooth control compared to the round wire technique. Round wire resulted in tipping movement with no root parallelism. Rectangular wire has two point contacts in the slot of the bracket which caused bodily movement of the central incisors. Tipping movement of the central incisors in mesial direction with round wire was because of one point contact in the bracket slot. This technique was less invasive because it controls the torque and root up righting [7-10]

CONCLUSION

"M" spring with rectangular wire is a better way of treating midline diastema in which the occurrence of relapse can be reduced because of bodily movement of the tooth in mesial direction. This "M" spring reduced the fabrication time and treatment duration.

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