International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Midline Diastema–Orthodontic Correction by M Spring: A Case Report

Dr Ashish Ramrao Dudule[1], Dr Sameer Parhad[2], Dr Vinay Umale[3], Dr Vaishnavi Kayarkar[4], Dr Utkarsha Gudadhe[5], Dr Meher Ingole[6], Dr Sharayu Nilkanth[7]

[1,7]MDS 2nd year PG, Department of orthodontics and dentofacial orthopaedics, Dr. Rajesh R. Kambe Dental College and Hospital, Akola
[2]Professor, Head of Department of orthodontics and dentofacial orthopaedics, Dr. Rajesh R. Kambe Dental College and Hospital, Akola
[3]Reader and [4]Lecturer of Department of orthodontics and dentofacial orthopaedics, Dr. Rajesh R. Kambe Dental College and Hospital, Akola
[5,6] MDS 3rd year PG, Department of orthodontics and dentofacial orthopaedics, Dr. Rajesh R. Kambe Dental College and Hospital, Akola

Abstract
In upper dentition midline diastema is a common aesthetic problem. Various causes of midline diastema such as Proclination of the upper labial segment, a large frenum, a missing tooth, peg lateral, midline supernumerary teeth, or other such as a self-inflicted pathology by tongue piercing. This specific diastema has been attributed to genetic and environmental factors, even though it is often a normal feature of growth, especially in primary and mixed dentition Aetiology of midline diastema is multifactorial. The primary etiological reason for midline spacing is high frenal attachment. The midline diastema can be closed with a combination of frenectomy and orthodontic therapy, which may help improve stability and relapse. Various treatment modalities are implemented to bring about closure of the diastema one of them is M spring was fabricated, activated and ligated initially with round arch wire followed by rectangular arch wire. After four months of treatment, the diastema was successfully closed. This approach uses less inventory and is efficient and effective.

Keywords: Midline diastema 1, M spring 2, Biomechanics 3

Introduction

In Greek Diastema means interval. Angle described the dental midline diastema as a rather common form of incomplete occlusion characterized by a space between the maxillary and less frequently the mandibular central incisors. Space between adjacent teeth is called a “diastema”. Midline diastemata (or diastemas) occur in approximately 98% of 6-year-olds, 49% of 11-year-olds and 7% of 12–18-year-olds. Most of the time, as dental development advances, the diastema that many children experience as a normal component of their mixed dentition spontaneously goes away. However, it might continue due to its width or other related factors. Treatment includes identification and removal of etiologic factor followed by various modalities, such as orthodontic tooth movement, restorative procedures with esthetic composite. Midline

diastema can be physiological, dentoalveolar, due to a missing tooth, due to peg shaped lateral, midline supernumerary teeth, proclination of the upper labial segment, prominent labial frenum and due to a self-inflicted pathology by tongue piercing. Now in some cases orthodontist use spring for closure of diastema. 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',

Etiology of Midline Diastema

Moyers (1988)19 studied 82 patients that presented maxillary midline diastema and reported the following causes:

1. imperfect fusion at midline of premaxilla (32.9%),
2. enlarged or malposed upper labial frenum (24.4%),
3. midline diastema as part of normal growth (23.2%),
4. congenitally missing lateral incisors (11%),
5. supernumerary teeth at the midline (3.7%),
6. unusually small teeth (2.4%),
7. combination of imperfect fusion and congenitally missing lateral incisors (2.4%).

Other causes for the development of the maxillary midline diastema referred in literature involve:

1. rotated teeth.
2. parafunctional oral habits, such as thumb/finger sucking or abnormal tongue posture.
3. orthodontic treatment, as in cases of rapid palatal expansion or false teeth movement.
4. increased anterior overbite.
5. distal or labial inclination of maxillary central incisors.
6. generalized spacing.
7. pathologic teeth migration due to periodontal disease

Case Report

20 yr old female patient reported to the Department of Orthodontics & Dentofacial Orthopaedics with a chief complaint of spacing between the upper front tooth region.

Diagnosis

On extraoral examination she had a mesocephalic, mesoprosophic face with convex facial profile and competent lips. Patient displayed a non-consonant smile arc.

Intraoral examination revealed Angle's Class I molar relationship with proclined upper and lower anteriors. Interdental spaces were present in upper and lower anteriors. A large, 5mm midline diastema was present with a prominent labial frenum.

Panoramic radiography showed root paralleling, impacted third molars and a healthy periodontal status.

Lateral cephalometric tracing revelead a Class I skeletal pattern with prognathic maxilla and mandible, horizontal growth pattern. Soft tissue analysis showed acute nasolabial angle.

Fig 1: Pre-treatment intraoral photographs

Fig 2: Pre treatment extra oral photographs

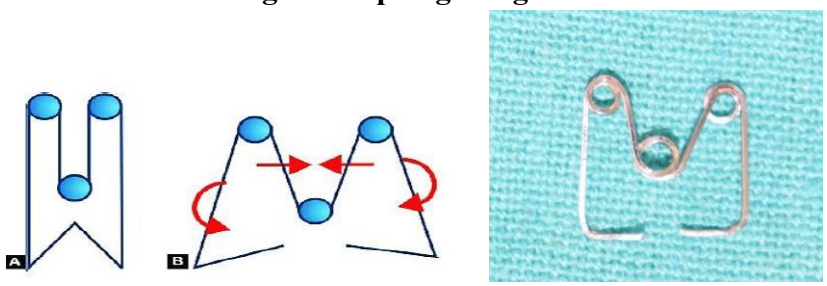
Treatment Plan

Following a thorough clinical and database analysis, a non-extraction treatment plan was decided. Closure of midline diastema using M spring was planned.

Spring Design

M spring was designed with 3 round loops of diameter 3 to 4 mm, one at the centre and two at the periphery. The spring was fabricated using 0.019x0.025 TMA wire. Care was taken so that it should not interfere the labial sulcus and other soft tissues.

Fig 3: M Spring design



Treatment Progress

0.022" × 0.028" slot MBT appliance was used in this case. M spring was placed between two maxillary central incisors. Initial levelling and alignment was simultaneously carried out using round and rectangular NiTi archwires. Interdental space closure was carried out in lower arch after levelling and alignment.

Fig 4: Treatment Mechanics

Results

Midline diastema closure was achieved at the end of 4 months during which activation of the M spring was done after every 3 weeks, after every activation of spring it may chances of create space between central incisor and lateral incisor. To overcome this problem, ligate upper anterior unite with ligating wire along with levelling and alignment round Niti wire.

Fig 5: Post treatment Intra oral photographs

Fig 6: Post treatment Extra oral photographs

Discussion

Mid line diastima cause due to various regeion, orthodontically treated such cases include fixed appliances, clear aligners, and M-springs. M-springs are shaped like the letter M and are made of a resilient wire that applies gentle pressure to close the gap over time. It is very simple to fabricate .

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.ligature anterior unit should be done it prevent space between central incisor and lateral incisor.

References

1. Brunelle JA, Bhat M, Lipton JA. Prevalence and distribution of selected occlusal characteristics in the US population 1988-1991. J Dent Res 1996; 75:706-713.
2. Richardson ER, Malhotra SK, Henry M, Little RG, Coleman HT. Biracial study of the maxillary midline diastema. Angle Orthod 1973;43:438-443.
3. Steigman S, Weissberg Y. Spaced dentition: an epidemiologic study. Angle Orthod 1985;55:167-176.
4. McVay TJ, Latta GH. Incidence of the maxillary midline diastema in adults. J Prosthet Dent 1984;52:809-811.
5. Nainar SMH, Gnanasundaram M. Incidence and etiology of midline diastema in a population in South India. Angle Orthod 1989;59:277-282.
6. Edwards JG. The diastema, the frenum, the frenectomy: a clinical study. Am J Orthod 1977;71:489 508.
7. Sullivan TC, Turpin DL, Artun J. A postretention study of patients presenting with a maxillary median diastema. Angle Orthod 1996;66:131-138.
8. Gass JR, Valiathan M. Familial correlations and heritability of maxillary midline diastema.Am J Orthod 2003;34-39.
9. Begg PR, Kesling PC. Begg orthodontic theory and technique. 3rd edition. Philadelphia, WB Saunders 1977:p1-2.
10.Mclaughlin RP, Bennett JC, Trevisi HJ. Systemized orthodontic treatment mechanics, Mosby International, 2001.
11.Anand Pramod Sondankar, Nitin Gulve, Sheetal Patani; 'M' Mechanics for the Management of Maxillary Midline Diastema; CASE REPORT, JIOS, 10.5005/jp-journals-10021-1163
12.Muhamad Abu-Hussein, Nezar Watted; Maxillary Midline Diastema – Aetiology And Orthodontic Treatment- Clinical Review; IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN:2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 6 Ver. II (June. 2016), PP 00116-130 www.iosrjournals.org