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Case Report

'Mouse' loop – for frictionless mechanics

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ABSTRACT

Introduction: Frictionless mechanics for extraction space closure is one of the commonly used method in orthodontic practice. The 'Mouse" loop is a new design for efficient and low friction space closure.
Description: The 'Mouse' loop has biomechanical advantages of increased range of activation and low load deflection rate. A case report is presented for the application of the loop. In the case report, a deciduous canine was extracted and its space was closed with the help of the 'Mouse' loop.
Conclusion: The space of the deciduous canine was closed within five months without any clinical disadvantage.

1. Introduction

The extraction space closure by loop mechanics is one of the most popular low friction alternative.[1]

The position of a loop, the design of a loop and the pre-activation bends of a loop are the important factors that determine the effects of the loop for space closure. Also, the length and diameter of the wire component of a loop are proportional to the load-deflection rate. An ideal loop would have a high potential for activation and a low load-deflection rate. Also, it would be comfortable for the patient and easy to fabricate.[2–5] This loop was introduced to reduce the chairside time as well as to increase the range of activation of the loop.

1.1. Loop design

The loop is fabricated with a 0.017 x 0.025" TMA sectional wire. The loop consists of two arms:

1. The alpha arm (*a*), it is the anterior arm of the loop.
2. The beta arm (ß), it is the posterior arm of the loop.

The straight 0.017 x 0.025" TMA wire is bent gingivally at an angle of 65° and from this bend a height of 8mm was measured and marked. At this mark a helix of the diameter of 2 mm was fabricated with the bird beak plier. This arm was considered as beta arm (ß) (Figure 1).

The wire was then extended horizontally and marked at 8mm. A helix of 2 mm diameter was fabricated at the marked region with the bird beak plier. Further, this wire was extended occlusally by 8mm and given a horizontal bend such that it forms an angle of 65° (Figure 1). This arm of the loop was considered as alpha arm (*a*) of the loop.

2. Why 'Mouse' loop?

The inner part of the loop design resembles head of a mouse, that is the inverted triangle formed and the outer helices resembles ears of the mouse.

2.1. Pre-activation bends

The pre-activation bends were incorporated in the loop. The alpha arm was 25° (*a*) and beta arm was 30° (ß) (Figure 2). These alpha and beta bends produce moments that counter the tipping moments generated by the forces of retraction by the appliance.

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The position of the loop is based on the clinician's requirements of the anchorage and the movements.

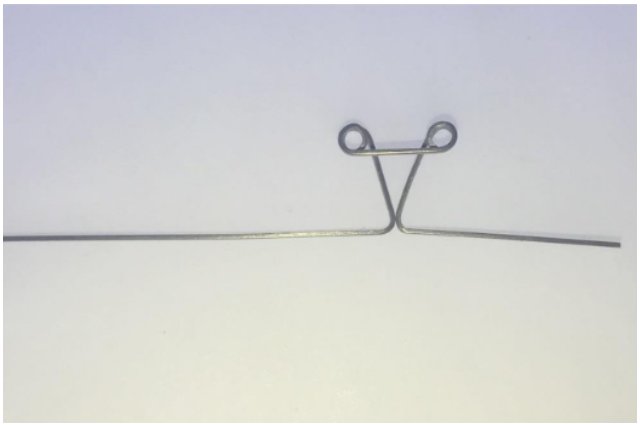

Fig. 1: The straight 0.017 x 0.025" TMA wire is bent gingivally at an angle of 65º and from this bend a height of 8mm was measured and marked. At this mark a helix of the diameter of 2 mm was fabricated with the bird beak plier. This arm was considered as beta arm (B).

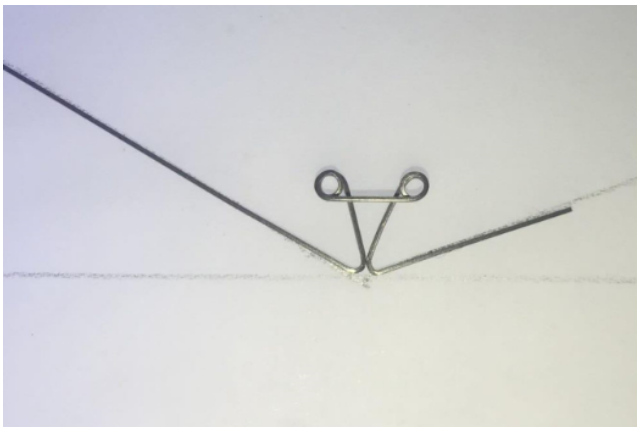

Fig. 2: The pre-activation bends were incorporated in the loop. The alpha arm was 25° (a) and beta arm was 30° (B).

2.2. Advantages

The 'mouse' loop provides similar results compared to other loops used for space closure, with the following advantages:

1. There is more control over the moment to force ratio. Permitting bodily movement, controlled tipping, or uncontrolled tipping as the practitioner's desire.
2. The load deflection rate is low in this loop.
3. Frequent activations are not necessary, reducing patient's appointments.
4. Improved patient comfort.

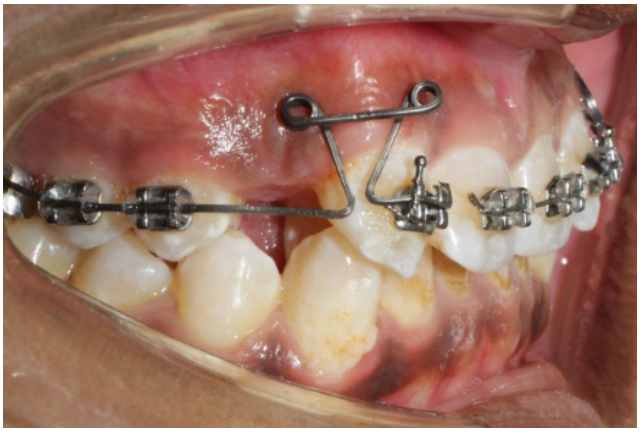

Fig. 3: The 'Mouse loop was fabricated and pre-activation bends were placed. The loop was placed in the pre-activation state for four weeks.

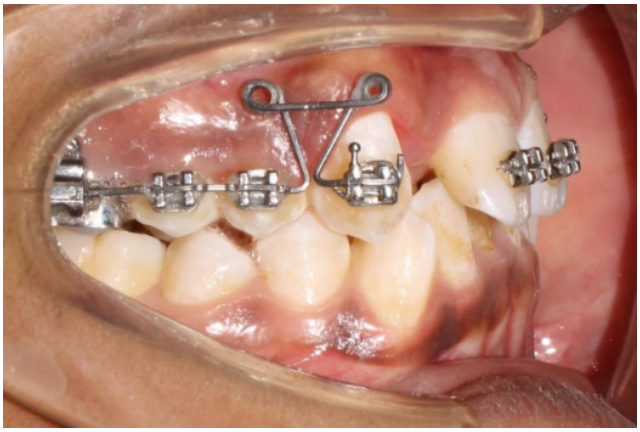

Fig. 4: The space of the deciduous canine was was closed after 5 appointments.

3. A Case Report

A 17 year old female reported with the chief complaint of crowding with the maxillary anterior region.

3.1. Diagnosis

1. Skeletal Class I jaw base relationship
2. Horizontal growth pattern
3. Angle's Class I malocclusion
4. Retroclination with the upper and lower anteriors
5. Palatally placed maxillary lateral incisors
6. Retained deciduous maxillary canines

3.2. Treatment objective

With respect to this case report the focus was on the use of the 'Mouse' loop.

Extraction of the deciduous retained teeth followed by the use of 'Mouse' loop for individual maxillary canine

retraction was the objective.

3.3. Treatment progress

1. Fixed appliance was planned with MBT prescription 0.022" slot brackets.
2. Extractions of the deciduous canines was done before starting the treatment.
3. Banding of the maxillary molars was done along with the use of transpalatal arch.
4. Bonding with the maxillary arch was done prior to the mandibular arch.
5. The use of the 'Mouse' loop was planned for the retraction of the permanent canine.
6. The loops used were of the dimension 0.017 x 0.025" TMA wire.
7. The 'Mouse' loop was fabricated and pre-activation bends were placed. The loop was placed in the pre-activation state for four weeks. (Figure 3)
8. The activation of the loop was done by opening the loop. The activation of the loop was of 2-3mm per appointment. Each appointment was scheduled after four weeks.
9. The space of the deciduous canine was closed after 5 appointments. (Figure 4)
10. Further treatment will be continued with the alignment and leveling of the maxillary and mandibular arch.

4. Conclusion

The 'mouse' loop has much better control over tooth movement during retraction with a low load - deflection rate. The fabrication of the 'mouse' loop is less time-consuming. Also, the loop reduces the chances of pricking of the wire in the posterior region usually seen with the sliding mechanics.

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6. Conflicts of Interest

There are no conflicts of interest.

References

1. Tselepis M, Brockhurst P, West VC. The dynamnic frictional resistance between orthodontic brackets and arch wires. *Am J Orthod Dentofac Orthoped*. 1994;106(2):131–8. doi:10.1016/s0889-5406(94)70030-3.
2. Burstone CJ. The segmented arch approach to space closure. *Am J Orthod*. 1982;82(5):361–78. doi:10.1016/0002-9416(82)90185-3.
3. Nanda R. Biomechanics and Esthetic Strategies in Clinical Orthodontics. Saunders, St. Louis: Elsevier; 2005. p. 201–3.
4. Vibhute PJ, Srivastava S, Hazarey PV. The snail loop for low-friction space closure. *J Clin Orthod*. 2008;42(4):233–4.
5. Ribeiro GU, Jacob HB. Understanding the basis of space closure in Orthodontics for a more efficient orthodontic treatment. *Dent Press J Orthod*. 2016;21(2):115–25. doi:10.1590/2177-6709.21.2.115-125.sar.

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