



Continuous T Loop Mechanics for Bimaxillary Protrusion – A Case Report

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Abstract

Bimaxillary protrusion is one of the most prevalent malocclusion encountered in orthodontic practice. Common treatment approach for bimaxillary protrusion is to extract first premolar and retract anteriors. There are two types of space closure which are sliding and loop mechanics. Loop mechanics which is also called frictionless mechanics, can be either segmental or continuous. Here’s a case report showing treatment of a male patient with bimaxillary protrusion with continuous T loop mechanics.

Keywords

Bimaxillary protrusion, frictionless mechanics, T loop

Introduction

Bimaxillary protrusion is proclination of both maxillary and mandibular incisors. It is one of the most prevalent malocclusion seen. A common treatment approach for bimaxillary protrusion is extraction of 1st premolar and retraction of anteriors^{1,2} Space closure after extraction can be done either by anterior retraction with group A anchorage, posterior protraction with group C anchorage or combination of both which is

group B anchorage.³Space closure stage of orthodontic tooth movement is achieved through two types of mechanics.⁴One type is sliding mechanics and other one is loop mechanics. Sliding mechanics has a disadvantage of friction within the archwire bracket interface.⁵Loop mechanics is also called frictionless and usually preferred in group A anchorage due to decreased anchorage requirement.⁶ Thus in this case report, continuous loop mechanics with T loop is used as anchorage requirement is high.

Case Report

Male patient aged 15years came to the department Of orthodontics and dentofacial orthopaedics with the chief complain of forwardly placed upper and lower teeth. He had no significant medical or dental history. Patient's father had similar

malocclusion. On extraoral examination, patient had oval facial form, convex profile, straight divergence, incompetent lip. On intraoral examination, patient had a Angle's class I molar relationship, Class I Canine relationship, overjet of 3mm and normal overbite with proclined upper and lower teeth and crowding in lower anteriors (Figure 1)The panoramic radiograph showed that all teeth were present. Cephalometric analysis showed a Class 1 skeletal pattern with normal mandibular plane angle. The maxillary incisors were proclined by 6mm and 35° in upper arch and 9mm and 36° in lower arch. Patient also had a acute nasolabial angle. Based on the finding, diagnosis was Angle's class I malocclusion with average growth pattern and anterior proclination and mild crowding in lower arch



Figure 1: Pre treatment photograph

Treatment Plan

The treatment objectives for this patient were to maintain the molar and canine relationship, correct thebimaxillary protrusion, correct lower anterior

crowding and achieve a normal soft tissue profile and to maintain ideal over jet and overbite. By correcting the protrusion of maxillary and mandibular anterior

teeth, the lip incompetence would be eliminated, and the acute nasolabial angle would be improved. Thus it was decided upon extraction of first premolars and anterior retraction with group A anchorage. Space closure can be brought about by sliding or loop mechanics. Loop mechanics was preferred in this case as it have better anchorage control and less friction. It was decided upon continuous T Loop arch wire with 17x25 TMA wire.

Treatment Progress

Maxillary and mandibular first molars were extracted. All teeth were bonded and banded with 0.022 PEA MBT prescription bracket. Initial levelling and

aligning were carried out with the help of copper niti wires. Alignment was completed within 5 months. Continuous T loop was fabricated with 17x25 TMA wire where the loop was placed towards the posterior segment as group A anchorage was necessary in this case. Alpha and the beta arm were of same length. Passive continuous T loop with reduced posterior segment was fabricated as shown in figure 2 and activate every 6 week by pulling the wire distal to 2nd molar and cinching by 2mm. This procedure was repeated until the extraction space was closed. After 9 months of retraction of the maxillary and mandibular anterior teeth, the extraction space was closed.



Figure 2: Treatment progress

After 16 months of treatment, the fixed appliance was removed with proper over jet and overbite and Class 1 molar relationship. Fixed retainers and Hawley's appliance in maxillary and mandibular arches for retention.

Treatment Results

The post treatment facial photographs showed marked improvement of the facial profile, and the patient's smile improved. Maxillary and mandibular anterior teeth protrusion were corrected, and a Class I

molar relationship and over jet and overbite was maintained (Figures 3). The upper incisors to NA plane had decreased from 35° to 22° and the lower incisors to

NB plane decreased from 36° to 28°. The movement of the maxillary and mandibular incisors contributed to correction of the soft tissue profile, and mentalis strain.



Figure 3: Post treatment photograph

Discussion

Space closure can be carried out by either sliding mechanics or loop mechanics.⁴ Loop mechanics have several advantages such as reduced friction, lesser anchorage requirement.⁶ Thus in our case, loop mechanics was used for space closure.

Till date various loop configurations have been described for space closure. Some of the designs have more advantages over the other.⁶ T loop has a higher M/F ratio and delivers more constant force over a large deactivation span than vertical loop.⁷ Due to the depth of the vestibule, the orthodontist is limited to how high the loop can be made. In order to overcome this problem, a wire, such as a T-loop, can be added horizontally. Thus in this case T loop was used for space closure. With continuous T loop arch wire we were able to attain full

retraction of anteriors with minimal anchorloss. Reduction of proclination also lead to reduction in lip protrusion thus, improving soft tissue profile. As the main concern of the patient to seek treatment was esthetics, patient was very happy with the results attained. Thus with this method we were able to attain structural balance, functional efficiency and esthetic harmony.

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