MODIFIED APPROACH OF FORCE APPLICATION IN IZC MINI-IMPLANT FOR ARCH DISTALIZATION BY ELASTOMERIC CHAIN – A CLINICAL TIP

Technical Notes

Mukesh Kumar¹, Manish Goyal², Ashish Kushwah³, Shashank Soni⁴

^{1,2}Department of Orthodontics and Dentofacial Orthopaedics, Teerthanker
Mahaveer Dental College & Research Centre, Moradabad

³Department of Orthodontics and Dentofacial Orthopaedics,
Institute of Dental Education & Advance Studies, Gwalior

⁴Consultant Orthodontist, Gwalior

ABSTRACT:

Distalization of whole arch required an appropriate force of application along with sound knowledge of biomechanics. After development of mini-implants it became quite easy because it doesn't need patient compliance which was a problem in olden days with conventional extraoral appliances. Introduction of extra-radicular mini-implant (IZC mini-implant) in orthodontics makes complete arch distalization single step procedure in comparison to intra-radicular mini-implants (conventional TADs) which we have to repositioned due to root approximation. This article represent a modified approach of Elastomeric chain application in IZC mini-implant for whole arch distalization.

Key words:

Modified approach,
IZC mini-implant, TAD,
Distalization, Elastomeric
chain, skeletal anchorage

Source of support : Nil

Conflict of interest: None

INTRODUCTION: In recent decades, TADs have been increasingly popular for managing difficult malocclusions in adults. However, the inter-radicular position of the mini-implants, a high failure rate, and their tendency to move when loaded has limited their application. In case of whole arch distalization we have to change the position of mini-implant during treatment in that case extra-radicular position of mini-implants (IZC & Buccal self) become very useful without extensive patient compliance. [1-4]

For distalization of complete maxillary segment 300gm to 400gm force is required on each side. With skeletal anchorage (IZC mini-implant) Elastomeric chain is more preferable over NiTi close coil to prevent soft tissue injury by NiTi close coil. Single Elastomeric chain (Figure 1) is not able to provide 300gm - 400gm force for distalization of complete maxillary segment, so we have to use two segment of pre-stretched Elastomeric chain on each side.

Position of IZC mini-implant in complete arch distalization make difficult and time consuming to place two Elastomeric Chain for achieving appropriate distalization force. In this situation modified approach helps clinician to desired force.

Figure 1. Conventional approach for Elastomeric chain application diagrammatic illustration

Method of application:

I use a method of pre-stretched Elastomeric chain application for arch distalization in IZC mini-implant that is a slight modification of the conventional approach for Elastomeric chain application (Figure 1):

1. Take a small segment of Elastomeric chain (at least 8-10 rings) and pre-stretched it.
2. Hold the middle ring of Elastomeric chain with the help of Mathieu orthodontic plier and engage it on the neck of IZC mini-implant (Figure 2).

Figure 2. Modified approach for Elastomeric Chain application diagrammatic illustration,

3. Hold the anterior segment of Elastomeric chain and engage it on Crimpable hook in between Lateral incisor and Canine after measuring appropriate force (150gm -200gm) by Dontrix gauge, similarly engage posterior segment of Elastomeric chain on Crimpable hook in between Canine and first premolar (Figure 3).

Figure 3. Modified approach for Elastomeric Chain application diagrammatic illustration

Figure 4 showing the effective application of modified approach of Elastomeric chain application, in which we achieved Class I Canine relationship from End-on canine relationship.

Figure 4. A) Pre-treatment intraoral photograph showing End - On Canine relationship
B) Before placement of IZC mini-implant, C) Canine position after arch distalization, D) Occlusal radiograph showing IZC mini-implant.

CONCLUSION:

Full arch distalization is a quite difficult task in orthodontics. Clinician should consider various things like molar angulations, third molar presence, amount of force etc before planning the arch distalization. Use of IZC mini-implant with modified approach of force application helps clinician to provide sufficient amount of force without changing the mini-implant position. Generally clinicians are using single Elastomeric chain with mini-implant which is not able to generate sufficient amount of force for arch distalization. For achieving that much force clinician should use double elastomeric chain but engagement of two elastomeric chains quite difficult to place on head of IZC mini-implant. This modified approach solves this problem and provide sufficient force. Application of elastomeric chain decreases the chances of soft laceration which is quite common with NiTi closed coil spring

REFERENCES:

1. Melsen B, Bosch C. Different approaches to anchorage: a survey and an evaluation. *Angle Orthod* 1997;67:23-30.
2. Kanomi R . Mini-implant for orthodontic anchorage. *J ClinOrthod* 1997;31:763-767.
3. Park HS, Lee SK, Kwon OW. Group distal movement of teeth using microscrew implant anchorage. *Angle Orthod* 2005;75:602-9.
4. Park HS, Kwon TG, Sung JH. Nonextraction treatment withmicroscrew implants. *Angle Orthod* 2004;74:539-49.
5. Ash JL, Nikolai RJ. Relaxation of orthodontic elastomeric chains and modules in vitro and in vivo. *J Dent Res* 1978; 57:685-690.
6. Chang CH. Clinical applications of orthodontic bone screw in Beethoven orthodontic center. *Int J OrthodImplantol* 2011;23:50-51.

CORRESPONDING AUTHOR :

Dr. Ashish Kushwah

Senior Lecturer

Department of Orthodontics and Dentofacial Orthopaedics,
Institute of Dental Education & Advance Studies,
Gwalior (M.P.)

Email : ashishkushwah998@gmail.com