

MSIs to Distalize the Entire Maxillary and Mandibular Arch in Borderline Cases: Two Case Reports

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Abstract

Bimaxillary protrusion has long been treated with the conventional approach of extraction of first premolars in both the upper and lower arches. But sometimes the patients refuse to undergo the extractions. And also in the borderline cases, the extractions can lead to the dished-in profile of the patient. In all these cases, distalization of the entire arch with the help of mini-screw implants can be a treatment alternative. Distalization of the upper or/and lower arch can also be used in class II and class III patients. The following are the two case reports showing distalization of the upper and lower arches with the help of mini-screw implants in the class I Bimaxillary protrusion patients.

Keywords- Distalization, Mini-screw Implants, Temporary Anchorage Devices

Introduction

Mini-screw implants (MSIs), often referred to as temporary anchorage devices (TADs), have become an accepted component of orthodontic treatment. Towards the end of 1980s, a number of clinicians focused on the use of mini implants for effective tooth movement. The use of mini-screw implants has added a new dimension in the field of Orthodontics and has enhanced the envelope of discrepancy. They are being used for various purposes like retraction, intrusion of anteriors as well as posterior teeth, distalization, mesialization, bodily movement, etc. by different authors. Recently, miniscrew implants and miniplates have become widely used to treat all types of malocclusions¹⁻⁴. The major advantage of these implants is that they make it possible to move multiple teeth without the loss of anchorage⁵.

In borderline cases, the distalization of complete maxillary or/and mandibular arch can be a treatment alternative to decrease the

protrusion of upper and lower lips instead of the conventional first premolar extractions.

Distalization of the entire arch aids in treating patients where the problem lies only in the dentoalveolar complex. The purpose of this article is to report two cases of Class I Bimaxillary malocclusion treated with distalization of both maxillary and mandibular arch.

Case Reports

Diagnosis and Etiology

Two patients with Class I Bimaxillary dentoalveolar protrusion are presented in this case report. The two cases had a very similar presentation of malocclusion. The pre-treatment facial photographs show convex profile with protrusive upper and lower lips. Nasolabial angle was acute. The pre-treatment intraoral photographs (Fig 1 & 2) demonstrate Class I molar and canine relationship with proclined upper and lower anteriors. In both the patients' hereditary basis of Bimaxillary dentoalveolar protrusion was

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found.



Fig 1- Case 1-Pretreatment Intraoral



Fig 2 - Case 2- Pretreatment Intraoral

Lateral cephalometric evaluation suggested Class I Bimaxillary dentoalveolar protrusion with acute nasolabial angle and protrusive upper, lower lips.

Panoramic radiograph showed normal morphology of condyle and mandible. All permanent teeth were present including the third molars.

Treatment Objectives

The treatment objectives are to decrease the bimaxillary protrusion, improve the facial esthetics and to maintain the buccal segment occlusion.

Treatment Alternatives

The two patients have both skeletal and dental Class I relationship with mild Bimaxillary protrusion. The conventional orthodontic treatment requires the extraction of maxillary

and mandibular first premolar and decreasing the protrusion with a moderate type of anchorage. With aging, the lip droops down and it gives an aged appearance. So, the disadvantage of extracting first premolar is that it can lead to dish in profile on the long term basis. The second approach of treatment is to extract all the 3rd Molars and distalize the maxillary and mandibular arch using skeletal anchorage. The patient was presented with both the treatment alternatives and the advantages and disadvantages. It was decided to distalize the maxillary and mandibular arches using mini implants. Direct method involves the placement of implant distal to the second molars while indirect method involves placement of implant between the premolar and canine and distalization by placing the jigs.

Treatment Progress

Both the maxillary and mandibular arches were bonded with MBT 022 prescription. Initial levelling and alignment of both the arches were achieved by sequential wires of .014 inches NiTi, .019 X .025 NiTi. The extraction of 3rd molars was done after the levelling stage. After the extraction of 3rd molars, mini implants were placed in both the maxillary and mandibular arch for distalization. The retraction was done by .019 X .025 in SS wire. The method of distalization used in both the cases was different.

In the first case, the implants were placed on the external oblique ridge in the lower arch and on maxillary tuberosity in the upper arch. Direct force was applied for distalization by crimping the crimpable hooks on .019 X .0125 inch wire between the lateral incisor and canine. (Fig 3)

In the second case indirect method of distalization was used. The implant was



Fig 3- Case 1- Arch Distalization with Mini-Screw Implants

placed in between the maxillary and mandibular second premolars and first molars in all the quadrants. And the force was directed towards the molars by using the jigs and coil spring. (Fig 4 & 5)



Fig 4 – Case 2- Right Lateral View, Arch Distalization with Mini-Screw Implants



Fig 5- Case 2- Left Lateral View, Arch Distalization with Mini-Screw Implants

Discussion

Numerous extraoral and intraoral modalities have been proposed for distalizing maxillary molars⁶⁻¹⁸ and few have been reported for mandibular molars²⁻⁴. Each technique has a disadvantage of the need for patient cooperation, tipping movement, anchorage loss, and flaring of the incisors. Moreover, it is very difficult to distalize the complete arch. With the advent of mini-implants in Orthodontics, new innovations and techniques are possible. The skeletal anchorage provides absolute anchorage which is required for distalization of complete arch. In this case reports, both indirect method and direct method for distalization was used.

Thus, an alternative approach of distalizing the complete arch as well as treating the class I bimaxillary protrusion cases has been presented.

Conclusion

These case reports describe an alternative treatment approach for bimaxillary dentoalveolar protrusion. This alternative treatment involves the use of temporary anchorage devices in the maxillary and mandibular arches for distalization of the complete arch.

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