

## **Mini Implants for management of Orthodontic relapse: A case report.**

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Stability is a primary objective in orthodontic treatment. Without it, ideal function or esthetics or both may be lost. Despite the utmost care in treatment and retention, relapse may occur either due to patient's non-compliance in wearing the retainer or sometimes when orthodontists fail to exercise the basic guidelines of moving the teeth within the bounds of normal muscle balance and apical base<sup>1</sup>. In few cases re-treatment is required in the form of re-banding or re-bonding most if not all the teeth. Admittedly this is an extreme measure but an interested and co-operative patient deserves that kind of consideration.

### **Case Report**

A 21 year old female patient presented with a relapse of orthodontic treatment and a chief complaint of deep over bite. The original treatment was done 8 years previously. All the first premolars were extracted for correction of proclined anterior teeth.

### **Diagnosis**

Extra orally, the patient had a mesoprosopic facial form with a mild convex profile. Intra orally she presented with a Class I molar and end on canine relation bilaterally with an over jet of 6mm, 100% deep overbite, curve of Spee of 4.5mm and spaces distal to the maxillary canines on both the sides. (Fig1)





Fig.1 Pre Treatment Intra Oral Views



Fig.2a. Pre-intrusion – Frontal view, mini implants placed between lateral incisors and canines bilaterally. E-chains placed to apply intrusive force.



Fig.2b Pre- intrusion-Left lateral view. Distal force from crimpable hooks to molars applied using e- chains.



Fig.2c Pre intrusion- Right lateral view. Distal force from crimpable hooks to molars applied using e- chains.

### **Treatment objective**

The treatment objectives were to establish an ideal over jet, overbite and canine relation by utilizing the spaces available in the arches.

### **Treatment progress**

This was a high anchorage case as limited spaces were available to correct the malocclusion and even minimal anchorage loss was not acceptable. Therefore to address this problem it was decided to place mini implants in the maxillary arch as anchorage for intrusion of all six anterior teeth.

The maxillary dental arch was divided into one anterior and two posterior segments. The anterior segment extended to the distal of the canines on either side. The posterior segments included the second pre molars and molars. The maxillary arch was segmentally aligned. On reaching a .019"x .025" stainless steel arch wire, crimpable hooks were placed between the lateral incisors and canines bilaterally. This was followed by placement of mini implants which were loaded immediately. For en-masse intrusion the mini implants were placed between lateral incisor and canine bilaterally at the junction of attached gingiva and movable mucosa. Availability of sufficient interdental bone, less soft tissue irritation and larger anterior segment which requiring greater control were some of the factors that were considered in the implant placement.<sup>2</sup> Also for the similar reasons and to keep the entire procedure minimally invasive, it was decided not to place a third implant between the roots of the maxillary incisors as has been done previously.<sup>3</sup> A calibrated Dontrix gauge was used to measure the amount of intrusive force being applied. 45 gms of intrusive force was applied using a pre-stretched elastic chain for en-masse intrusion of six maxillary anterior teeth. A distal force of about 20 gms was applied using a pre-stretched elastic chain extending from the maxillary molar hook to the tag incorporated distal to the canines in the anterior segment. This was done to prevent flaring of the anterior teeth and to redirect the force close to the centre of resistance of anterior teeth. (Fig. 3)



Fig. 3 Post intrusion frontal, left and right lateral views.

The patient was recalled every 4 weeks and the elastic chain was changed by pre stretching it to deliver the required force. The implants were also checked for any clinical mobility at each appointment. More than 4mm of intrusion was obtained in 5 months (Fig 4).





Fig. 4 Post De-bonding

Inter proximal reduction was carried out for alignment and leveling in the lower arch.

Burstone Intrusion arch was later used to intrude the lower anteriors. Final finishing and detailing for both the arches was achieved with .019x.025 TMA arch wires. The total duration of the treatment was 13 months (Fig.4).

After debonding, bonded lingual retainers made from 0.017-inch multi-stranded wire (Unitek, Coaxial, 3M/Unitek, Monrovia, CA, USA) were used for both the arches. In addition to this, a removable Hawley retainer with anterior bite plane was placed in the maxillary arch to maintain the corrected deep over bite

One year post retention records showed acceptable esthetics and functional occlusion (Fig.5).





Fig. 5 Post Retention

### **Discussion**

Management of relapse cases can be difficult in terms of availability of space to correct the existing malocclusion. Such cases require meticulous planning before executing the treatment to prevent anchorage loss. Another important consideration in management of such cases is the duration of the treatment, as prolonged duration with fixed mechanotherapy may cause apical root resorption<sup>4</sup>. As the patient had already

undergone orthodontic treatment, we focused on correcting the malocclusion within the shortest optimum duration. In the above case the correction of the deep overbite and over jet was primarily achieved by intrusion of maxillary incisors and leveling of the mandibular arch using controlled proclination of the mandibular incisors. The mini implants were used as intraoral anchorage for en masse intrusion of all six maxillary anterior teeth in a single step instead of the traditional; two step intrusion of canine and incisors<sup>4</sup>. This approach not only reduced the anchorage concern, but also simplified the biomechanics involved, and reduced the overall duration of treatment in general.

Although the forces were extremely physiologic, some clinically insignificant root resorption was detected in the post-treatment periapicals of the maxillary incisors.

### **Conclusion:**

This case report demonstrates a conservative method to manage a relapse case. The mechanics involved were simplified to attain the acceptable results while reducing the overall duration of the active treatment.

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