“MIST” Molar Uprighting with Mini Implants (TADs)

by Dr. Jose A. Trespalacios

Introduction

Our society, increasingly aware, informed and demanding, has been a significant spearhead in the past few years for technology to make a radical orthodontic revolution, by requiring us to address the need for minimal patient compliance and maximal anchorage control. The push in this direction has resulted in the advent and popularization of self-ligating braces, lingual braces, invisible orthodontics and of course, mini implants (TADs).

Mini implants have appeared with a promise of delivering powerful results in solving challenging malocclusions that exceed the limits of conventional orthodontic procedures. They are capable of offering solutions in various types of treatment that previously were extremely improbable and very complicated to perform (Figures 1A-B and 2A-B). Another reason for the popularity of mini implants is the ease of their placement within the orthodontist’s office, without the services of another dental specialist.

But the reality of mini implants today is that many treatments performed with them are based on our common sense and are somewhat empirical. This leads to the need to seek more established proposals and better structured protocols. If we look further, it is easy to see that when modifying our anchorage, the biomechanics change radically (Figure 3A-C).
Facing the reality of the extremely rapid growth in the use of mini implants, there is an increasing need to create a complete system to help the orthodontist perform different types of treatment with these attachments (Figure 4A-D) and to avoid having common sense as the only guide. MIST (Mini Implant Simplified Treatments) is developed as an option to give confidence to every new user.

**Molar Uprighting**

Second molar impaction is a very challenging disturbance because the vectors of movement required to upright the molar with intrusion\(^3\) is particularly difficult to accomplish and requires proper clinical, radiological, and biomechanical evaluation and a good appliance selection for successful treatment results\(^4\).

The incidence of second molar impaction revealed by panoramic radiograph studies has been reported as 0.03%\(^5\) to 0.04%\(^6\) of all impacted teeth (Figure 20).

It is usually thought that the correction of mandibular molars can be accomplished by the specialist only when orthodontic appliances are in place, and other orthodontic problems are being resolved\(^7\). But this is not necessarily correct. A mini implant placed in the alveolar bone buccal to the mandibular molars can provide both a buccally directed force and an intrusive force without any orthodontic appliances besides a molar tube and a wire.

**Patient Preparation**

1. Select a 6 to 8 mm (Figure 5) mini implant to be placed in the mesiobuccal area of the adjacent tooth mesially to the tipped molar (Figure 6A-B). As we said before, one of the most reliable mandibular buccal cortical sites is found mesial to the first molar\(^8\). From there we can have an absolute anchorage made by the mini implant, creating no reactive forces to the adjacent teeth, and therefore no negative side effects\(^9\).

**Figure 4A-D:** Closing an open bite and opening a deep bite, an example of mini implant treatments.

**Figure 5:** Mini implant 6 to 8 mm.

**Figure 6A-B:** The mini implant is placed mesially from the adjacent tooth of the tipped molar.

2. Insert between the roots perpendicular to the bone surface, trying to position it on attached gingiva preferably 3 mm from the buccogingival line (Figure 7A-B) to avoid harming the buccal mucosa when we activate the system (Figure 8). From here we can provide intrusive and distal force without any other orthodontic appliance on the anchorage unit.

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\(^{3}\) Intrusion: Moving the tooth inward towards the midline.

\(^{4}\) MIST: Mini Implant Simplified Treatments.

\(^{5}\) 0.03% to 0.04% (Incidence of second molar impaction).

\(^{6}\) 0.03% to 0.04% (Incidence of second molar impaction).

\(^{7}\) Orthodontic appliances are in place, and other orthodontic problems are being resolved.

\(^{8}\) Mesial to the first molar.

\(^{9}\) Absolute anchorage created by the mini implant, creating no reactive forces to the adjacent teeth, and therefore no negative side effects.
3. Place a mini tube from the opposite side molar in the distobuccal face with the hook facing mesial and gingival. In case you have a band or a tube, you can use it as long as you have wings to tie an elastic from behind (Figure 6A-B).

Fabrication of the Wire Performed to Upright

1. Take a TMA wire bar 17×25” (Figure 9A-B).

2. Make a loop with a diameter of about 2 mm in one edge (Figure 10A-B).

3. Mark and bend 2 mm away from the loop to 90° (Figure 11A-B).

4. Measure the distance between the mini implant and the distal part of the tube (Figure 12A-B).

5. Cut and place a protective tube 20% larger than the previously measured distance until reaching the anterior bend of the wire (Figure 13A-B).

6. Make a loop on the back edge of the protection tube, and leave the arm at 45° of the internal angle. You should leave at least 5 mm after cutting (Figure 14A-B).
7. Insert an elastic chain in the posterior loop (Figure 15A-B).

4. Place a portion of flowable composite over the head of the mini implant to prevent the wire to disengage (Figure 19A-B).

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**System Activation**

1. Insert the posterior part of the wire distal to the tipped molar tube (Figure 16A-B).

5. In this case a force is generated to distalize, intrude and rotate the molar counterclockwise.

2. Pull and engage the elastic on the hook (Figure 17A-B).

6. Wait until the uprighting is completed and it can be finished with braces if necessary (Figure 21A-B).

3. Push the wire and place the loop around the head of the mini implant making pressure on the tipped molar (Figure 18A-B).

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**System Deactivation**

1. Cut the elastic from the hook.

2. Break all the bonding material over the mini implant head with a hard wire cutter.

3. Remove the loop from the head.

4. Pull out the wire from the tube or band.

5. Use the driver to engage the implant head and then rotate it in a counterclockwise direction until it is sufficiently loose to remove with a cotton forceps.

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7. Insert an elastic chain in the posterior loop (Figure 15A-B).

**Figure 15A-B:** Insert an AlastiK™ Ligature chain in the second loop.

**Figure 16A-B:** Insert the wire from behind the tube.

**Figure 17A-B:** Pull the chain and engage it as close as possible to the tube or band, cut the extra.

**Figure 18A-B:** Engage the wire in the mini implant head, an intrusion and distalization forces are applied to the molar.

**Figure 19A-B:** The flowable composite can help to prevent displacement.

**Figure 20:** Second molars impacted against the first molar.

**Figure 21A-B:** Molar uprighted in less than four months with very few appliances.
Conclusions

It is important to understand the strengths and limitations in mini implant treatment. MIST should be further developed with the experience of doctors interested in this field, and each time include more effective procedures and methodologies, such as the parallelization of molars. In this article I have tried to show how to do this treatment with just a few appliances, putting the mini implant in a safe, accessible area, and with emphasis on patient comfort, which is one of the most important premises in the system. If you would like more information on the MIST System, there is further discussion on my website, www.ortoimplantes.com.mx.

[Note: Currently in Spanish, English version being developed. – Editor]

Regarding the selection of the brand of mini implant to use, I am convinced that the Unitek™ Temporary Anchorage Device (TAD) System is a great choice. Unitek TADs belong to the self-drilling and self-tapping group, we can get all the instruments required to place them in any area, and Unitek TADs have a diameter of 1.8 mm, which makes a fracture extremely unlikely. We can also take advantage the Unitek™ TAD O-Cap to make a laboratory apparatus, or simply to give the patient greater comfort. But one characteristic I really like is that I don’t need to inventory a huge stock of the implants, because with just 3 measures, 6, 8 and 10 mm, I can place a reliable implant in my patients.

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Case photos provided by Dr. Jose A. Trespalacios.

References

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