

### **Newer Mini Implant Guide For Correct Positioning of Tad's**

<sup>1</sup>Dr. Lingesh kumar, Post graduate student, Department of Orthodontics and Dentofacial Orthopedics, Thai Moogambigai Dental College and Hospital, Chennai, Tamil Nadu, India

<sup>2</sup>Dr. Ramyathilagam, Post graduate student , Department of Orthodontics and Dentofacial Orthopedics, Thai Moogambigai Dental College and Hospital, Chennai, Tamil Nadu, India

<sup>3</sup>Dr. Ramachandra Prabhakar., MDS., Professor, Department of Orthodontics and Dentofacial Orthopedics, Thai Moogambigai Dental College and Hospital, Chennai, Tamil Nadu, India

<sup>4</sup>Dr. Raj Vikram, MDS., PhD, Professor, Department of Orthodontics and Dentofacial Orthopedics, Thai Moogambigai Dental College and Hospital, Chennai, Tamil Nadu, India

<sup>5</sup>Dr. Saravanan, MDS, Professor, Department of Orthodontics and Dentofacial Orthopedics, Thai Moogambigai Dental College and Hospital, Chennai, Tamil Nadu, India

**Corresponding Author:** Dr. Lingesh kumar, Post graduate student, Department of Orthodontics and Dentofacial Orthopedics, Thai Moogambigai Dental College and Hospital, Chennai, Tamilnadu, India.

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#### **Abstract**

Mini Implants Has Opened Up A New Dimensions In Treating The Malocclusions Which Was Thought To Be Difficult To Treat . The Success Of The Implant Depends On The Accuracies In Implant Placement. Many Minim plant Guide Has Been Introduced In The Orthodontic Literature For Bettering The Horizontal And Vertical Positioning Of The Minim plant. But The Stents With Multiple Loops Takes Much Of Chair side Time And They Are To Be Fabricated For Every Patient Since After The Placement Of Mini Implant They Are Cut . To Overcome This The Article Introduces A Universal Stent For All Patients Which Is Easy To Fabricate And Remove .

**Keywords:** Stent, TADS, Mini Implant Guide

#### **Introduction**

Orthodontists Have Been Using Variety of Auxiliaries or Stents for Positioning of Minis crew Implants. Accurate Positioning Has Always Been Great Importance For The Effective Functioning Of Dental Implants. The Term

Skeletal Anchorage Has Opened Up A New Dimensions In Treating Complex Malocclusion Problems. Skeletal Anchorage Has Gained Few Advantages Like Eliminating The Borderline Surgical Cases , But The Need For Surgical Exposure Of The Site Is A Major Setback In Miniplates Placement .To Overcome This, Temporary Anchorage Device (TAD'S)Have Started Gaining Attention In Orthodontics. Kuorda Et Al Determined That The Ideal Separation Between A Minis crew And Any Adjacent Root Is At Least 1mm<sup>(1)</sup> .Bran mark And Co-Worker Reported The Successful Osseo integration Of Implants In Bone.<sup>(2)</sup> . The Success of tad's Lies Mainly In Their Stability. Various Stents and Their Modifications Have Been Introduced in the Orthodontic Literature for the Correct Position, But the Extensive Laboratory Procedures for the Accurate positioning Makes Them Time Consuming for the Patient and Increase in Chair Side Time. To Overcome The Difficulty In Making The Stent And Their Helical Structures Or Acrylization Newer Stent Has Been Evolving

Since The Introduction Of TAD And Will Continue To Do So

### Armamentarium

0.017x 0.025 TMA or SS Wire Ribbon Arch Plier Metal Scale Distal End Cutter Marker Pen

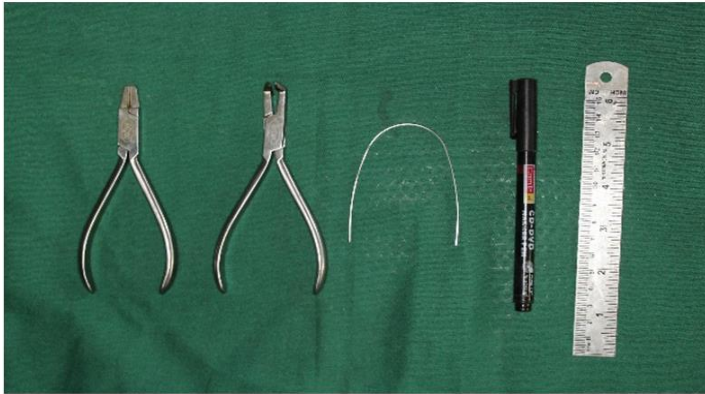


Figure 1

### Construction

A TMA or SS wire of 0.017x 0.025 is taken and the wire is cut at one end. The wire is bent into horizontal and vertical bends using ribbon arch plier.

**Step-1:** A length of 3mm is marked from one end of the wire and a right angle bend is given.

**Step-2:** The right angle bend is placed gingivally and distance of 10mm mark is marked and a right angled bend is given to the vertical bend.

**Step-3 :** The right angle bend is placed in same direction as that of initial horizontal bend of 3mm and a distance of 5mm is marked.

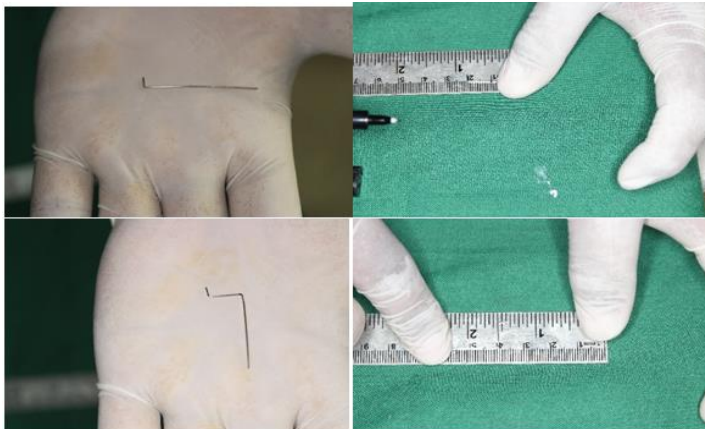


Figure 2

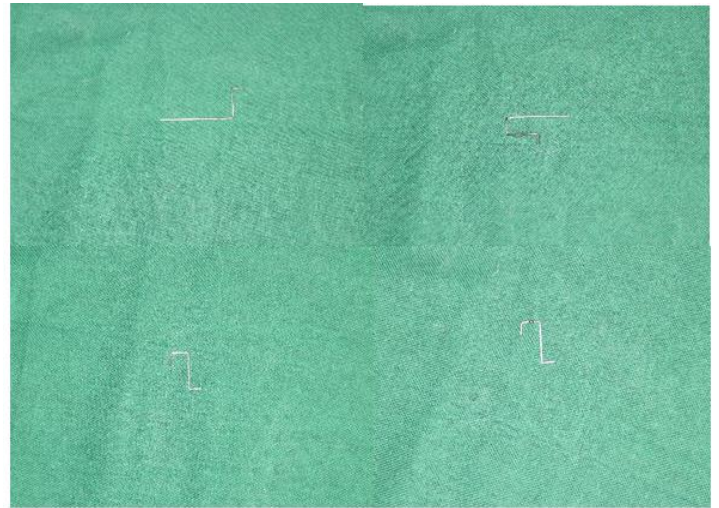


Figure 3

**Step-4:** Again a right angle bend is given to the wire. The bend is placed vertically parallel to the initial vertical bend.

**Step-5 :** A radiopaque marking at the 2mm&3mm level is marked on the final horizontal bend , or a indentation with the airtor is placed.

### Stent Placement

After the stent construction, stent was placed in the bracket in such a way that the initial horizontal bend was placed in the wire slot of the second premolar. The position of the initial vertical bend is parallel to the root and is secured with the help of metal ligation or a module. IOPA was taken with correct angulations. The vertical bend should be placed in between the two wings such that it bisects the wings of the bracket into left and right compartments. In case of self ligating systems the initial horizontal bend is placed a little distal to the brackets of the tooth.

TAD is placed below the final horizontal bend between the 2<sup>nd</sup> and 3<sup>rd</sup> markings with correct angulation ,and a post operative IOPA is taken and its position is verified

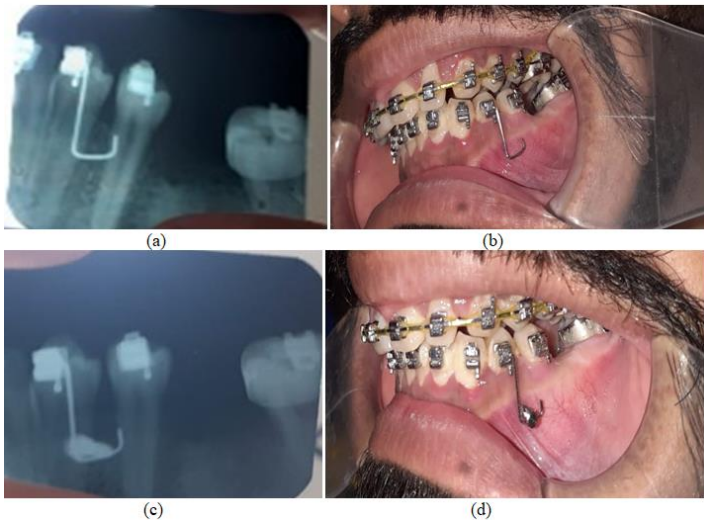


Figure 4: (a) Pre-operative intraoral periapical radiograph of a patient with L stent in place, (b) clinical photograph of the patient with L stent in place, (c) a 2x10 mm mini-implant is placed with the stent, (d) post operative IOPA of same patient after mini-implant placement

#### Advantages

- Can be easily fabricated
- Less time consuming and economical
- Can be sterilized and reused
- No need of extensive procedure like helix placement or acrylic add up
- Reduced wire bending

#### Disadvantages

- X ray direction should be perpendicular to the occlusal plane.
- Desired angulation of the x ray beam plays major role in the position of the tad and amount of interdental bone.
- Radiopaque markings/serrations in the final horizontal bend is a difficult task.
- Placing the stent in between the wings is not possible in self ligating system.

#### Discussion

Several stents are designed to better the placement of TAD but their extra laboratory procedures like acrylizing the guide to the occlusal plane<sup>(3)</sup> and incorporating the helix as in TNA stent<sup>(4)</sup> makes it difficult to fabricate it in chair

side. The Fig.5 is a case of male patient aged 27 years requires serialization of 37 . L stent is placed between the lower left premolars and pre operative IOPA is taken using cone paralleling technique<sup>(5)</sup> (Fig.6a) and TAD is screwed between the premolars with correct angulation (Fig.6b). Then IOPA is taken with the stent and TAD to confirm the position and stability of the miniscrews. Fig. 4c is IOPA of the same patient with the stent.

Sometimes the minis crews placed for the anterior retraction is also used for anterior intrusion in the upper arch in few cases. Such cases the minis crews to be placed little close to the vestibular region for achieving active intrusion i.e, the TAD is to be screwed above the final horizontal bend. The bilateral placement of the minis crew at similar height is a difficult task that leads to cant in the occlusal plane which can be eliminated in almost all the cases since the placement is in accordance with the horizontal bend. The L stent offers better stability and placement in the bone in all the three dimensions since the horizontal and vertical components are with definite measurements and bilateral placement at the similar height is achieved with ease. L stent when constructed in excess cut wire that is to be placed in the bracket offers better contour of the alveolar mucosa.

According to Papageorgiou et al, minis crews have a 12.0% failure rate when placed in the maxilla while there is a 19.3% failure rate in the mandible<sup>(6)</sup> . For the mini implant placement in maxilla, the safe zone is between the second premolar and first molar. For the mandible it is between the first and second premolars<sup>(7)</sup>.

#### Conclusion

A careful clinical and radiographic assessment for accurate horizontal and vertical placement of implant is necessary for achieving the orthodontic goals through absolute anchorage with minis crew. L stent provides both horizontal and vertical accuracy for the mini implant placement and

even though the primary success of mini implant lies in cortical bone thickness , soft tissue health and adequate bone <sup>(8)</sup>

### **Compliance with ethical standards**

All studies were conducted in accordance with principles for human experimentation as defined in the Declaration of Helsinki and International Conference on Harmonization Good Clinical Practice guidelines , and approved by the relevant institutional review boards.

### **Informed consent**

Informed consent was obtained from the study participant after they were told of the potential risks and benefits as well as the investigational nature of the study

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