Abstract
Clinicians continue to need anchorage that displays a high resistance to displacement. According to Newton’s Third Law, there is a reaction for every action, control of which is difficult to achieve intraorally. Earlier, orthodontists used extraoral traction to reinforce intraoral anchorage. Nevertheless, patients seldom used headgears 24 hours a day- 7 days a week, hence this source of anchorage was often compromised. Development of the simple, stable, and easy-to-use orthodontic mini-implant represents a critical turning point in the search for effortless control of orthodontic anchorage. Of course, many problems remain unresolved. Given the relatively short (10-year) history of the use of mini-implants in orthodontic treatment, long-term data is necessarily limited. This review presents the complete history of orthodontic mini implants along with the pros and cons and the different clinical situations in which they can be used.

Keywords:
Implants, orthodontics, anchorage
**Introduction**

Sometimes in orthodontics the dictum ‘divide and rule’ has to be followed; be it the separate movement of crown and root of a particular tooth or movement of one particular tooth or few teeth at a time. This is usually done to avoid the unwanted mesial migration of the posterior teeth into the available space (Anchor Loss). Temporary anchorage devices provide an answer to this. This article will provide an insight into the temporary anchorage devices used in orthodontics.

**Classification:**

1. According to shape
   - Straight/cylinders
   - Tapered
   - Stepped

2. According to site
   - Maxilla
     - Infrazygomatic crest area
     - Maxillary tuberosity area
     - Intra radicular between the roots both buccally and palatally
     - Mid palatine area
   - Mandible
     - Retro molar area
     - Intra radicular area
   - Mandibular symphysis
   - Others
     - Edentulous areas

3. According to material
   - METALS AND METAL ALLOYS
     - Titanium
     - Tantalum
     - Alloys of titanium/aluminium/vanadium
     - Cobalt/chromium/molybdenum
     - Chromium/iron/nickel
     - Titanium and its alloys are most widely used.
   - CERAMICS AND CARBONS
     - Aluminium oxide (aluminium and sapphire) ceramics
     - Carbon
     - Carbon silicon compounds.
   - POLYMERS AND COMPOSITES
     - Polymethylmethacrylate
     - Silicon rubber
     - Polyethylene
     - Polylactide
Uses:

a) Used for retraction of anterior teeth,

b) Uprighting of molars.

c) Mesiodistal tooth movement,

d) Open bite correction (archived by intruding posterior teeth: skeletal anchorage)

e) Distalization of 1st and 2nd molars

f) Intrusion of teeth

g) Compromised anchorage in periodontally involved teeth where anchorage is a problem/congenital anomalies and developmental defects of jaws which may result in inadequate anchorage.

h) Replacement of missing teeth after the completion of orthodontic treatment (should be done only after completion of craniofacial growth)

Surgical procedure:

• Direct method
  — To place mini-implant directly without an Incision
  — Indicated in placements over 'attached gingiva'

• Indirect Method
  — Placements over 'unattached gingiva'
  — Will require a vertical incision of 2 to 5 mm in length.
  — Relatively less commonly used
  — The implant will be covered by the gingival tissue

➢ Micro-implant Driving Methods

• Self Tapping - Pre-Drilling with a suitable drill 0.2 mm less than that of the mini implant to be implanted

• Self Drilling - No need to pre-drill
  Just use a round bur or a small 2 to 4 mm drill to get a 'purchase point', especially when angulating the implant

➢ Surgical Procedure for Self Drilling

Step I -isolate the region and apply surface anesthetic (15% Lidocaine)

Step II -anesthetize using infiltration 0.2 ml anesthetic

Step III -mark the exact location using the periodontal probe.
**Step IV**- using the tissue punch expose the bone
exposed bone would cause the bleeding point to be visible

**Step V**- under copious irrigation make pilot hole (using a round bur or drill-2 to 4 mm in length) through the cortical bone (optional but preferable)

**Step VI**- using the adaptor/screw driver provided screw the mini-implant into the bone, or use an ‘implant’ physio-dispenser.

- Surgical procedure for removal of mini-implant

Since the mini-implant does not osseo-integrate the mini-implant can be easily unscrewed using the screw driver provided.

It leaves small bleeding point which heels without any medication or suturing required.

### Contraindications:

1. **Medical**
   - Temporal (flu, pregnancy, etc.)
   - (Auto) immune diseases
   - Terminal illness
   - Inability to restore with prosthesis
   - Use of corticosteroids
   - Radiotherapy of the head, (tumoricidal radiation of implant site)
   - Severe Diabetes mellitus
   - Psychological problems (unrealistic patient expectation)

2. **Dental**
   - Anatomy-nerves (too close), sinus, etc.
   - Local pathology-cyst, roots stumps, gum problems, etc.
   - Microbiology-bacterial sensitive.
   - Bad oral hygiene
   - Lack of operator expertise
   - Motivation
   - Non cooperative patient

3. **General**
   - Finance
   - Touring job (unable to keep appointments)
   - Attitude
   - Spastic patient

**Conclusion:**

As is said that the only thing constant in this world is “CHANGE” and orthodontics is no exception. Temporary anchorage devices have made the treatment more efficient and made the treatment outcome more predictable in this fast moving world.
References


