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Practical information on adult and lingual orthodontics

Mini-screws for skeletal anchorage (M.A.S.) in Lingual Orthodontic: Cases reports.

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Anchorage control is a major concern in the design of all orthodontic appliances. When extraoral devices are employed, anchorage can be quite stable but depends on the patient's cooperation. All intraorally derived anchorage is unstable, necessitating appliances which can be complicated, inefficient, and often require the extraction of dental units. However, an advantage of appliances using intraorally derived anchorage is that they do not require extensive cooperation from the patient. If there were intraoral anchor points that were predictably stable for the period of treatment, relatively noninterfering, biocompatible, and comfortable, appliance design could be greatly simplified and more efficient.

This is particularly desirable in lingual technique, in where the adult patients desire a aesthetic and no compliance treatment.

Osseointegrated titanium implants have been used successfully to replace missing teeth, but their use for orthodontic anchorage has been limited by space. Conventional dental implants can only be placed in retromolar or edentulous areas. Another limitation has been the direction of force application: a dental implant is placed on the alveolar ridge and is too large for horizontal orthodontic traction. Furthermore, dental implants are troublesome for patients because of the severity of the surgery, the discomfort of initial healing, and the difficulty of oral hygiene. For these reasons, it has been a major objective in clinical research to find methods that could incorporate the advantage of the implants for maximum anchorage without their limitations.

Very recently clinicians have started to use mini-implants (mini-screws) for orthodontic anchorage. Conventional dental implants are 3.5-5.5mm in diameter and 11-21mm long. The mini-screws, illustrated in this presentation so called M.A.S. (Miniscrew Anchorage System) are only 1.3-1.5 mm in diameter and 11 mm long (total lenght),tapered shape , making it much more

useful in orthodontic applications. (Fig 1).
The screws are small enough to place in any area of alveolar bone, even apical bone or between the roots of maxillary and mandibular teeth. They are commonly utilized for closing spaces of extractions, intruding incisors and molars, levelling the cant of the occlusal plane, distalizing molars, rotating teeth and any other dental movement that required a maximum anchorage without patient's compliance.
In lingual therapy ,the miniscrews application is greatly improved from the larger anatomical root space (safe zone) between second premolar - first molar and first molar-second molar in the palatal side than in the buccal side. (Fig 2,3)

Fig 1:Miniscrews M.A.S. 11mm length 1,5 and 1,3 mm diameter

Fig 2: Safe zone in the palatal interradicular site

Fig3: Safe zone in the maxillary labial interradicular site

The surgical procedure is easy enough for an orthodontist or general dentist to perform and minor enough for rapid healing. We has introduced in the surgical procedure five security keys (Fig 4-11).
1. Surgical guide with intraoral x ray
2.Superficial and light anestesia.
3. Preparation bone site with pilot drill 2-3 mm maximum inside the bone.
4. Hand-screw driver insertion of miniscrew
5. final intraoral x-ray

Fig 4: First security key : Surgical guide with intraoral x ray

Fig 5:First security key

Fig 6: Second security key :Superficial and light anestesia

Fig7: Third security key :Preparation bone site with pilot drill 2-3 mm maximum inside the bone

Fig 8-9: Forth security key : hand-screw driver insertion of miniscrew

Fig 9: Forth security key

Fig 10-11: :Fifth security key : final intraoral x-ray

Fig 11::Fifth security key

The long term stability is predictable and reliable, while the removal does not require anesthesia and do not leave any modification to the tissues.
The mini-screw is easily removed after orthodontic traction and bone healing after removal is uneventful.
The mini-screws have brought a great impulse for totally avoid patient's compliance in all different kind of orthodontic movements, and have solved the problems related to the anchorage control.
The Authors present different clinical application of M.A.S. in lingual orthodontic therapy.

Case 1:
Cristina R., Female 28 years old (Fig 12-15)

Fig 12: pre-treatment facial potos
Fig 12: Pretreatment facial photos

Fig 13: pre--treatment intra oral potos

Fig 14: pre--treatment cephalometric x-ray

Fig 15: pre--treatment panoramic x-ray

Diagnosis: II class div 1 ;Normo-open bite; No presence of 16,36,46. Skeletal normo-bite

Treatment Plan: Extraction of 14,24.
Device: Lingual appliance upper; buccal appliance lower; Miniscrew MAS 1,5 mm diameter 11mm length to closure extraction space .

Treatment progress (Fig 16,17)

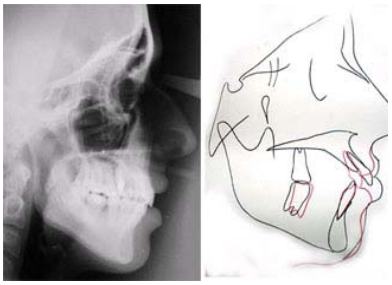
Fig 16: Retraction of the anterior segment using M.A.S. for anchorage

Fig 17:M.A.S 1.5 mm diameter 11 mm length for space closure

Final results (Fig 18-20)

Fig 18: Post-treatment intra oral photos

Fig 19: Post-treatment facial photos



20: Post-treatment cephalometric x-ray and superimposition

Case 2:
Nadia L. , Female 24 years old. (Fig 21-24)

Fig 21: Pre-treatment intra oral photos

Fig 22: Pre treatment facial photos

Fig 23: Pre-treatment cephalometric x-rays

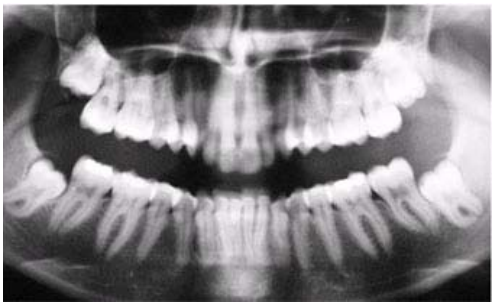


Fig 24: Pre-treatment panoramic x-rays

Diagnosis: II class div 1 ;Dental deep bite; Skeletal deep-bite

Treatment Plan : Extraction of 24, push forward the mandible .

Device: Jusper jumper, Lingual appliance upper; buccal appliance lower; ; Miniscrew MAS 1,5 mm diameter 11mm length to closure extraction space .

Progress therapy (Fig 25,26)

Fig 25: Miniscrew MAS 1,5 mm diameter 11mm length to closure extraction space

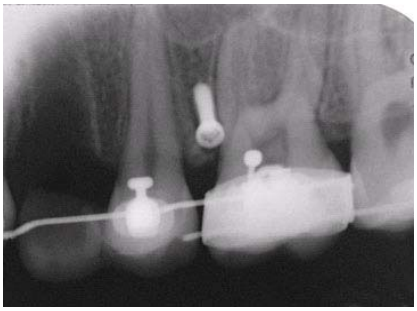


Fig 26: Miniscrew MAS 1,5 mm diameter 11mm length to closure extraction space

Final treatment result (Fig 27,28)

27: Post-treatment intra oral photos

Fig 28: Post-treatment facial photos