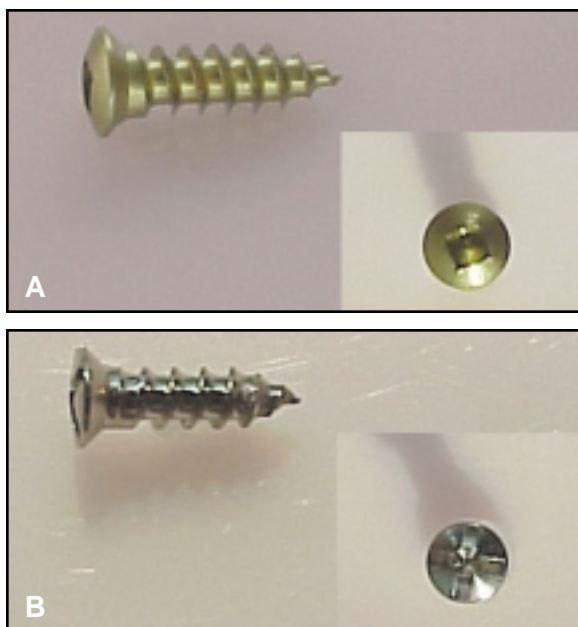


# Use of Miniscrews for Intermaxillary Fixation of Lingual-Orthodontic Surgical Patients

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**I**ntermaxillary fixation (IMF) of surgical patients who elect to have lingual orthodontic treatment is difficult for the surgeon to accomplish because there are no attachments on the labial surfaces of the teeth. Even metal buttons bonded temporarily to the labial surfaces<sup>1</sup> may be esthetically unacceptable for these patients. Moreover, the use of button attachments for IMF may cause extrusion of the involved teeth.

If the bone screws normally used for rigid fixation in orthognathic surgery (Fig. 1) are also used for IMF, there is no need for labial attachments. The intermaxillary wiring will impinge on the gingival tissue, however, because of the



**Fig. 1** Conventional bone screws. **A.** Center-drive drill-free screw.<sup>\*\*\*</sup> **B.** Osteomed.<sup>\*\*\*\*</sup>

inherent curvature of the alveolar process. We have found the recently developed titanium OSAS miniscrew\* to be an effective alternative (Fig. 2). The screw has a 3mm-long unthreaded head that protrudes above the gingiva, with a dumbbell shape that prevents wires or elastics from sliding toward the soft tissue. The threaded part of the screw, 1.6mm in diameter, is available in lengths of 6mm, 8mm, and 9mm.

## Clinical Application

An 18-year-old female presented with an upper diastema and total crossbite (Fig. 3). She had a skeletal Class III malocclusion, and her upper first molars were missing. Presurgical orthodontic treatment was carried out using .018" Ormco lingual brackets.\*\* Leveling and

\*Part No. 25-1506 (6mm screw), Epoch Medical, Kangnamku Yeoksamdong 828-10, Seoul, Korea.

\*\*Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867.

\*\*\*KLS Martin, 11239-1 St. Johns Industrial Parkway, South Jacksonville, FL 32246.

\*\*\*\*Part No. 211-1606, Osteomed Corporation, 3750 Realty Road, Addison, TX 75001.



**Fig. 2** OSAS miniscrew.

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alignment of both arches was followed by decompensation with Class II intermaxillary elastics.

In the patient's seventh month of treatment, mandibular setback surgery was performed, along with advancement and reduction genioplasty (Fig. 4). For IMF, six 6mm Osteomed bone screws\*\*\*\* were inserted into the buccal cortical bone around the upper and lower apical

regions on both sides (Fig. 5). These self-drilling screws are inserted directly through the mucosa under local anesthesia; no pilot drilling or flap dissection is required, which greatly facilitates the process. The screws can be drilled into the bone with a 256:1 contra-angle† or manually

\*\*\*\*Part No. 211-1606, Osteomed Corporation, 3750 Realty Road, Addison, TX 75001.

†Anthogyr, 164 Rue des Trois Lacs, 74700 Sallanches, France.



Fig. 3 18-year-old female with skeletal Class III malocclusion and missing upper first molars.



Fig. 4 Immediately after mandibular setback surgery.

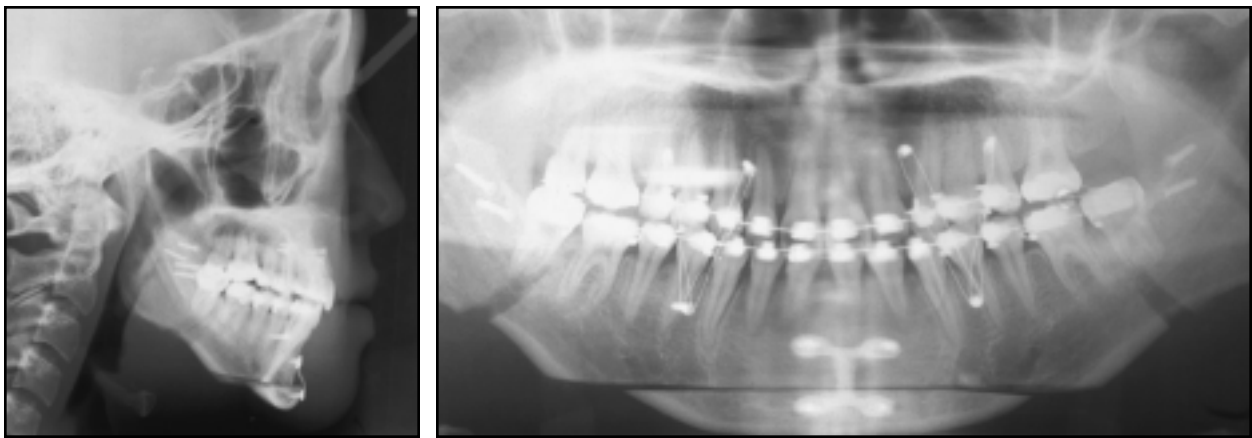


Fig. 5 Postoperative radiographs showing six miniscrews inserted for intermaxillary fixation.

with a specially designed screwdriver\*\*\*\* and can easily be removed under local anesthesia with the same instrument. Bone healing after removal is usually uneventful.

When conventional bone screws are used, the surgical splint holds the intermaxillary wires away from the soft tissues to some extent, but gingival irritation and mucosal impingement are inevitable (Fig. 6). On the other hand, the OSAS miniscrews keep wires or elastics from contacting the soft tissues whether or not a splint is present, as shown in a different patient (Fig. 7). The protruding screw heads facilitate application of wires or elastics, and oral hygiene is easier for the patient to maintain. The insertion method for the OSAS screw is the same as for the self-drilling Osteomed screw.

\*\*\*\*Part No. 210-1000, Osteomed Corporation, 3750 Realty Road, Addison, TX 75001.

In the original patient shown above (Figs. 3-5), after two weeks of IMF, the bone screws were removed under infiltrative anesthesia. After post-surgical lingual orthodontic treatment, the patient's profile had greatly improved, the mentalis strain had disappeared, and the teeth were well aligned (Fig. 8).



Fig. 6 IMF using conventional bone screws. Surgical splint prevents some soft-tissue impingement, but does not avoid gingival irritation and mucosal impingement.





Fig. 7 A. Different patient after presurgical orthodontic treatment. B. IMF after mandibular setback surgery, with eight OSAS miniscrews in place. Flexible IMF with elastics is shown, but rigid fixation with wires is also possible. C. After removal of IMF and miniscrews.



Fig. 8 Original patient after treatment, showing improved facial appearance and occlusion.

## Conclusion

Because of their convenience and clinical efficacy, miniscrews<sup>2,3</sup> are rapidly replacing dental implants<sup>4-10</sup> and miniplates<sup>11</sup> in orthodontic applications. Use of the miniscrews for IMF offers the following advantages:

- No preparation is necessary to secure a location for a stable, rigid fixture.
- The miniscrews are easily placed and removed, and intermaxillary wires and elastics can be tied immediately after insertion.
- Oral hygiene is much easier to maintain than with conventional methods of IMF using either buttons or arch bars.
- Chairtime is dramatically reduced; it takes only a few minutes for each screw insertion, and there is no need for the orthodontist to weld or solder surgical hooks on the archwires.

This safe and simple procedure allows the use of esthetic lingual appliances throughout the entire treatment of surgical patients.

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