

Miniscrew Treatment of Ectopic Mandibular Molars

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This article describes our experience with miniscrews in the treatment of ectopic lower second molars.

Screw Selection and Placement

The miniscrews* we use for orthodontic anchorage are made of pure medical titanium. They are 7mm long, with a maximum diameter of 2.3mm, and have a partial thread with a 2mm diameter on the external side (Fig. 1). The first model had a stress capability of 550N/mm², but perhaps due to fractures, the breaking load was raised to 869N/mm². The miniscrew kit includes a drill and screwdriver (Fig. 2).

Miniscrews are always placed under local anesthesia, using one of two surgical procedures. The direct method consists of raising a subperiosteal flap and then suturing the incision (Fig. 3). If the marginal gingiva is thick enough, the indirect or transmucosal technique is indicated, without a surgical flap (Fig. 4). Once the surgical site has been prepared with the appropriate drill, the miniscrew is inserted with the screwdriver provided (Fig. 5).

*Modulsystem 2.0, Cizeta Surgical S.R.L., via Commenda 48, San Lazzaro di Savena, Bologna, Italy. E-mail: info@cizetasurgical.it.



Fig. 1 Cizeta Modulsystem 2.0 miniscrew.

If the stability of the miniscrew is adequate, it can be immediately loaded with orthodontic forces. The miniscrews generally do not move during treatment, nor do they show mobility at the time of removal. At the end of orthodontic treatment, or when the anchorage is no longer needed, the screw is removed under local anesthesia, using the screwdriver. The oral mucosa around the surgical site will usually recover within 10-14 days.

Orthodontic Management

The adult patient shown here presented with a typical ectopic eruption of the mandibular second molars (Fig. 6). About 90 days after the mandibular third molars were removed, two

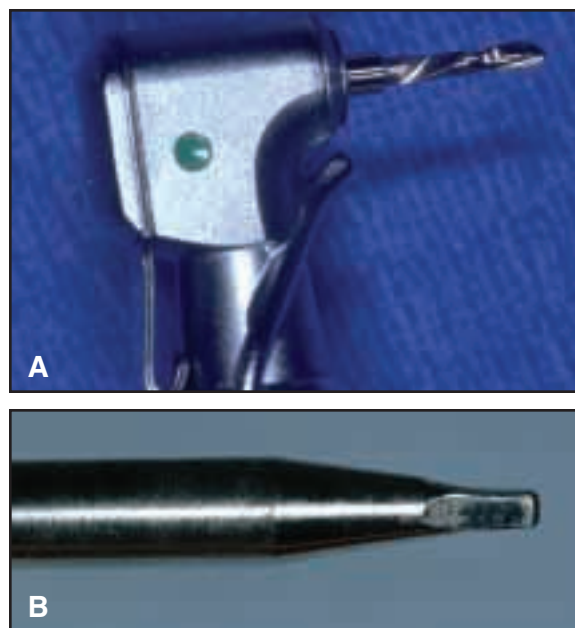


Fig. 2 A. Drill for surgical site preparation. B. Screwdriver.

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Fig. 3 Direct method of miniscrew placement, with subperiosteal flap.

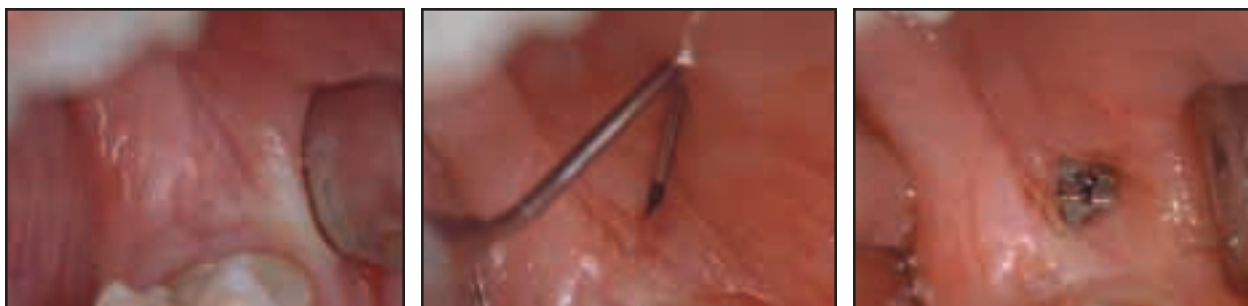


Fig. 4 Indirect method of miniscrew placement, without surgical flap.

miniscrews were inserted in the retromolar areas. The same day as the surgery, orthodontic traction was applied by means of elastic threads, each exerting about 150g of force, attached from the miniscrews to hooks bonded to the ectopic molars (Fig. 7). The single force applied to the ectopic molar generates an extrusive moment and allows distal tipping of the crown.

The elastic thread was replaced throughout treatment, so that a continuous force was maintained 24 hours a day until the screws were removed. The hooks bonded to the molar crowns were moved mesially whenever feasible.

A finishing phase with fixed appliances is always needed to achieve the correct root uprighting (Fig. 8).



Fig. 5 Inserting miniscrew with supplied screwdriver.

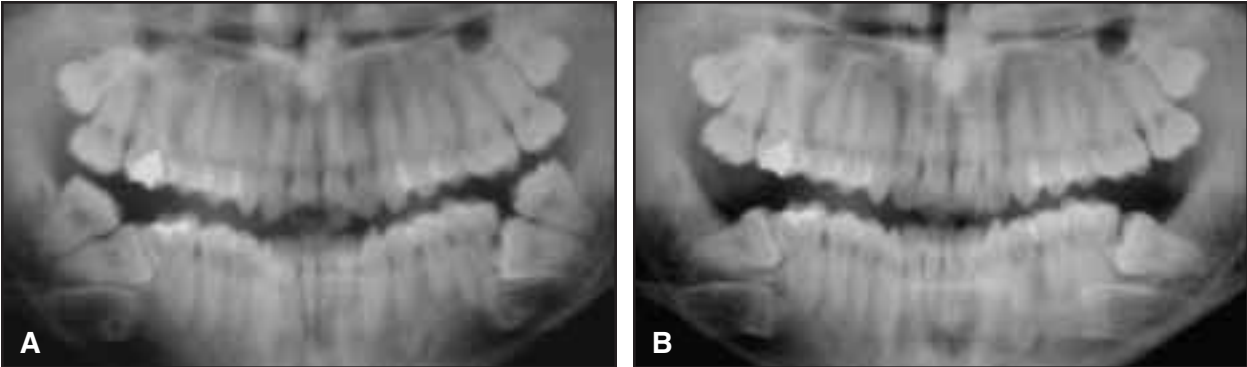


Fig. 6 A. Ectopic eruption of mandibular second molars in non-growing patient. **B.** After extraction of mandibular third molars.



Fig. 7 After miniscrew insertion, about 150g of force applied with elastic thread to hook on ectopic molar crown.

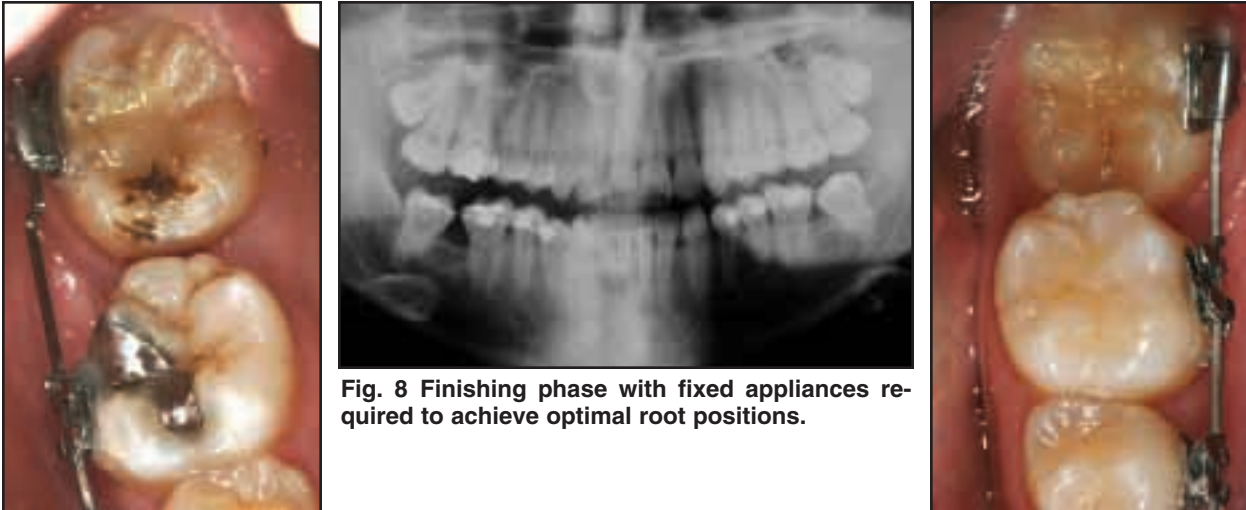


Fig. 8 Finishing phase with fixed appliances required to achieve optimal root positions.

Conclusion

Miniscrews can provide maximum anchorage for restricted therapies such as uprighting a single tooth. Even when conventional orthodontic treatment is needed, however, placing titanium miniscrews in the retromolar areas can be an effective way to avoid loss of posterior anchorage, thus improving treatment predictability and efficiency.

The screws shown here have optimal mechanical retention, permitting their immediate loading. The surgical procedure has been well tolerated by patients.

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