

Template Fabrication for a Midpalatal Orthodontic Implant: Technical Note

William Martin, DDS, MS¹/Michael Heffernan, BDS, MS²/James Ruskin, DMD, MD³

An implant has been developed as an adjunct to conventional orthodontic anchorage. Planning is advisable to determine the available bone and soft tissue thickness and the optimum position for orthodontic utilization. A simple method is described for fabrication of a radiographic and surgical template to aid in optimal placement of the implant. (INT J ORAL MAXILLOFAC IMPLANTS 2002;17: 720-722)

Key words: midpalatal implant, orthodontic anchorage, surgical guide

Oseointegrated implants have been used to provide anchorage in orthodontic therapy.¹⁻³ Many orthodontic patients have a complete dentition; therefore, conventional implant placement for anchorage is impossible. The placement of an implant in the midpalatal region has been shown to be successful.^{1,4,5} The Straumann Orthosystem (Institut Straumann AG, Waldenburg, Switzerland) was developed for use in the midsagittal region of the hard palate to provide orthodontic anchorage.

As with conventional implant therapy, planning is advisable to determine the available bone and soft tissue thickness and the optimum position for orthodontic use. The recommended site for the Orthosystem implant is in the mesial third or mid-third of the midsagittal hard palate.⁶ However, adequate bone height for the implant should be assessed with a lateral cephalogram.⁷ This article describes a simple method for fabrication of a radio-

graphic and surgical template for the Orthosystem midpalatal implant.

MATERIALS AND METHODS

A maxillary cast in dental stone is prepared and the proposed implant site marked. With a 2.2-mm (3/32-inch) drill, a 10-mm hole is made perpendicular to the palatal incline (Fig 1a). A metal rod (2.2 mm in diameter, 15 mm in length) is placed in the hole, and with a vacuum former (Buffalo Dental Manufacturing, Syosset, NY) a clear 0.02-inch vacuform sheet is adapted to the cast. The vacuform template is trimmed from the top of the rod, allowing the rod to be retracted to meet the patient's palatal soft tissue (Fig 1b). A lateral cephalogram is taken with the radiographic template in position (Fig 2). Radiographic interpretation allows accurate measurement of the soft tissue and bone height at the planned implant site, simplifying the choice of implant (Orthosystem implants are available with 2 placement depths, 4 mm or 6 mm, and 2 transmucosal collar heights, 2.5 mm or 4.5 mm).

Fabrication of the surgical template utilizes the same maxillary cast as the radiographic template. If the implant site appears acceptable from the cephalogram, the hole in the cast is enlarged with a 5.0-mm (13/64-inch) drill. A metal rod (5.0 mm in diameter, 10 mm in length) is inserted, and the cast is dampened with water and coated with a separating

¹Clinical Director, Center for Implant Dentistry, College of Dentistry, Health Science Center, University of Florida, Gainesville, Florida.

²Fellow, Center for Implant Dentistry, University of Florida, Health Science Center, University of Florida, Gainesville, Florida.

³Co-Director, Center for Implant Dentistry, College of Dentistry, Health Science Center, University of Florida, Gainesville, Florida.

Reprint requests: Dr Will Martin, Center for Implant Dentistry, University of Florida, Health Science Center, P.O. Box 100416, Gainesville, FL 32610-0416. Fax: +352-392-7609. E-mail: wmartin@dental.ufl.edu

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Fig 1a Cast with implant site marked and metal marker in place.



Fig 1b Radiographic template in place.



Fig 2 Lateral cephalogram with radiographic template.



Fig 3a Cast with final implant position.



Fig 3b Cast with trimmed surgical template.



Fig 4a Surgical template in place following anesthetic infiltration.

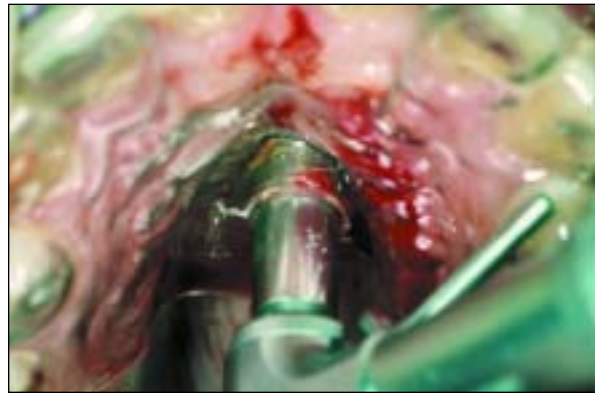


Fig 4b Mucosal trephine guided by template.



Fig 4c Orthosystem implant in optimum position.

medium (Rubber-sep, Great Lakes Orthodontics, Tonawanda, NY) (Fig 3a). A vacuform sheet (0.08-inch) is adapted to the cast (Fig 3b). The surgical template is trimmed away from sites of local anesthetic infiltration, permitting an intimate, rigidly stable, palatal adaptation intraorally (Fig 4a). This will allow accurate guidance for the mucosal trephine at implant surgery (Fig 4b).

SUMMARY

The clinical advantages of radiographic and surgical templates for the Orthosystem implant include pre-operative evaluation of soft and hard tissue heights at the planned surgical site and transfer of bone height from the radiograph to the surgical template. The result is simplification of the surgical procedure, reduction of possible nasal sinus perforation complications, and assurance of correct placement in the optimum site and angulation for orthodontic anchorage (Fig 4c).

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