Surgical Template Stabilization with Transitional Implants in the Treatment of the Edentulous Mandible: A Technical Note

Alexandre-Amir Aalam, DDS[1]/Mamaly Reshad, DDS, MSc[2]/Winston W. L. Chee, DDS[3]/Hessam Nowzari, DDS, PhD[4]

Proper placement and orientation of dental implants is a requirement for the optimum function and esthetics of the definitive restoration. Surgical template stability during the surgical phase is a key element in the success of proper implant placement. Therefore, any clinical tool that enhances the precision of reproduction is of value. This article describes a simple, noninvasive, cost-effective technique for surgical template stabilization utilizing 2 transitional implants placed the same day as the definitive implants. Int J Oral Maxillofac Implants 2005;20:462–465

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Manufacturers have introduced transitional dental implants for new applications in implant dentistry. Transitional implants are placed in a 1-stage surgical procedure and are immediately loaded. They support a fixed temporary prosthesis while definitive implants or bone grafts are healing. Precise placement and orientation of dental implants are necessary for optimum function and esthetics of the definitive restoration.[1] Utilization of a surgical guide is recommended to facilitate and optimize the surgical placement of dental implants.[2,3] Stability of the surgical template during the surgical phase is a key element of accurate implant placement.[4]

When treating the edentulous mandible, tissue-supported surgical templates have poor stability because of the lack of rigid anatomic landmarks once the flap has been raised. Numerous template fabrication techniques have been developed to overcome this problem.[5,6] Ease of use and increased cost effectiveness during treatment have expanded the indications and applications of transitional dental implants in all areas of dentistry.[7–10] This is particularly true in the surgical aspect of implant dentistry.[11]

This article describes a simple, noninvasive, cost-effective technique for surgical template stabilization. Two transitional implants placed the same day as the definitive implants are used.

TECHNICAL NOTE

Prior to dental implant placement, 2 transitional dental implants (Fig 1) are placed anteriorly to the retromolar pad area. Care is taken to avoid anatomic structures which have previously been identified (Fig 2). The surgical template is hollowed out immediately adjacent to the transitional implants to allow passive fit of the template over the transitional implants (Fig 3). Parallelism of the implants is verified, and premature occlusal contacts with the opposing

[1]Assistant Professor, Advanced Program in Periodontics, University of Southern California, Los Angeles, California.
[2]Resident, Advanced Program in Prosthodontics, University of Southern California, Los Angeles, California.
[3]Director, Implant Dentistry, University of Southern California, Los Angeles, California.
[4]Director, Advanced Program in Prosthodontics, University of Southern California, Los Angeles, California.

Correspondence to: Dr Alexandre-Amir Aalam, Department of Periodontics, University of Southern California, Los Angeles, CA 90025. Fax: +310 477 4998.
E-mail: aalam_perio@yahoo.com

Fig 1 A 14-mm-long IPI transitional implant (IPI; Nobel Biocare, Yorba Linda, CA).

Fig 2 Two transitional implants placed in the retromolar area.

Fig 3 Lingual view of the surgical template. Note that the molar areas are hollowed out for passive fit over the transitional implants.

Fig 4 Pickup of the prosthetic coping.

dentition are avoided. The transitional implant is shortened apically in order to conform to the limits imposed by the occlusal surface of the opposing dentition and the mandibular canal. Prosthetic copings are placed over the transgingival portion of the implant; complete seating and passivity with the surgical template is rechecked. A pickup technique is used to join the prosthetic coping to the surgical template using autopolymerizing acrylic resin (GC pattern; GC Corporation, Tokyo, Japan) (Fig 4). A fine brush is used to apply the acrylic resin incrementally in a controlled manner. Meticulous care is advised at this stage, as the acrylic resin may lock onto the undercuts on the coronal aspect of the implant (Fig 5). To assure proper positioning of the surgical template during polymerization, the patient is asked to keep his or her mouth closed, with teeth in maximal intercuspation. Once stability and the correct positioning of the surgical template have been verified, surgical placement of the definitive implants may take place. The guide may now be easily and frequently replaced at exactly the same position during the surgical phase. After the definitive dental implants have been placed (Fig 6), transitional implants are either left in situ to contribute to the support of the immediately loaded prosthesis or removed (Fig 7).

DISCUSSION AND CONCLUSION

Dental implant placement is a prosthetically-driven discipline that requires a surgical intervention. A well-thought-out and executed treatment plan

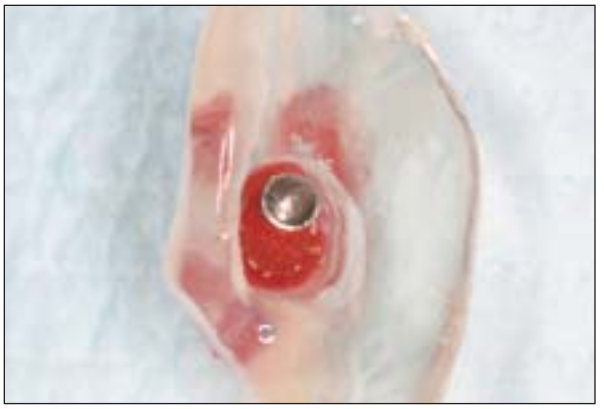

Fig 5 Close-up view of the pickup. Note that no acrylic resin has flowed beyond the coping.

Fig 6 Osteotomies were performed in the proper positions for the placement of definitive implants for prosthetic support.

Fig 7 Mandibular immediately loaded prosthesis delivered the day of implant placement.

Fig 8 Transitional implant used as a fixed reference to index occlusal relationship.

includes a functional and esthetic waxup. The waxup is used to construct provisional restorations and radiographic and surgical templates. These steps will assure predictable surgical placement of dental implants. Therefore, any surgical tool that helps precisely execute the planned implant placement is of utmost importance. In an indirect technique involving a pickup impression and pour-up of a master cast, Simon[11] used 10 transitional implants placed 2 months prior to surgical placement of the definitive dental implants to stabilize the surgical template as well as the transitional prosthesis. Immediate loading of definitive implants placed in the edentulous mandible when indicated has become a viable prosthetic option.[12–16]

Placing only 2 transitional implants on the same day of definitive implant placement has multiple advantages:

- Reduced cost
- Reduced technical issues such as parallelism, draw, and fit of the surgical template on the transitional implants
- Fewer surgical visits
- Avoidance of placement of transitional implants at close proximity to the sites where the definitive implants will be placed
- Ease of manipulation of the surgical template during surgery

Transitional implants may be also be used to aid the prosthetic phase of treatment. They can be used as a fixed reference for recording jaw relationships (Fig 8).

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