

Imperative role of surgical templates in accurate implant positioning: A key to success

Dental implants have been used in a variety of different forms for many years. Since the mid-twentieth century, there has been an increase in interest in the implant process for the replacement of missing teeth. Branemark applied scientifically based research techniques to develop an endosseous implant that forms an immobile connection with bone. To establish a logical continuity between the planned restoration and the surgical phases, it is essential to use a transfer device.^[1] The surgical guide template is fabricated by the dental technician after the presurgical restorative appointments, once the final prosthesis, number and location of optional abutments, occlusal scheme, and implant angulations have been determined. The desired configuration of the surgical stent is determined by the prescribed prosthesis. The surgical template dictates to the surgeon the placement of the implant body that offers the best combination of 1) support for the repetitive forces of occlusion, 2) esthetics, and 3) requirements of hygiene.^[2,3]

The literature has evidenced various methods of fabrication for the surgical template. The requirements are more relevant than the options of fabrication. The template should be stable and rigid when in correct position. If the arch treated has remaining teeth, the template should fit over and/or around enough teeth to stabilize it in position. If the arch has no remaining teeth, the template should extend onto unreflected soft tissue regions. In this way, the template may be used after the soft tissues have been reflected from the implant site.^[4,5]

The ideal angulation for implant insertion should be determined on the diagnostic wax-up, and the template should relate to this position during surgery. This requires at least two reference points for each implant. For that purpose, the surgical guide must be elevated above the edentulous bone. The distance between two points located respectively on the occlusal surface (central fossa or incisal edge) of the planned abutment crown and the crest of the ridge represents about 8 mm.^[6,7] As a result, these two points of reference can be joined by a line that represents the path of ideal insertion of the implant. The ideal angulation is perpendicular to the occlusal plan and parallel to the most anterior abutment (natural or implant) joined to the implant. Other ideal requirements of the surgical template include

size, surgical asepsis, transparency, and the ability to revise the template as indicated. The template should not be bulky and difficult to insert or with obscure surrounding surgical landmarks.^[8] The surgical template must not contaminate a surgical field during bone grafts or placement of the implant. It should be transparent. In this way, the bony ridge and drills can be observed more easily when the template is in place. The surgical template should be related to the ideal facial contour. Many edentulous ridges have lost facial bone, and the template can determine the amount of augmentation required for placement of the implant or support of the lips and face. The surgical template may be used in conjunction with a bone graft, and later the same template may be used for insertion of implants and again for uncovering the implant. A sturdy template permits resterilization and use for several procedures.^[9-11] Therefore, the use of surgical guides for the placement of the implant will assist the surgeon undoubtedly to create biomechanically sound implant locations. Nevertheless, it dictates to the surgeon about placement of the implant body that offers the best combination of support for the repetitive forces of occlusion, esthetics, and requirements of hygiene.

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