

# Dental implants—Treatment options for compromised clinical situations

## Part II—The edentulous maxilla

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### Abstract

Implant-supported therapy for the patient with an edentulous maxilla is dependent on several treatment planning issues. The factors that determine the choice of treatment include the following:

- \_The general health of the patient.
- \_The goals of the patient, such as the need for removal of the palatal portion of the prosthesis, increased stability when chewing, or the desire for a fixed prosthesis.
- \_The aesthetic requirements of using acrylic to restore the soft tissue profile of the patient.

\_Availability of bone in the anterior and posterior maxilla.

\_Financial considerations.

\_Consent for bone grafting deficient sites, including considerations of bone harvest site morbidity.

Treatment planning is usually initiated at the restorative dentist's office. This includes establishing the patient's goals for the outcome he or she desires at the completion of implant therapy. Once these goals are set, the surgeon is seen and an assessment of bone availability is performed. After the amount of bone needed is determined, with

Fig. 1 Locators supported upper overdenture.

Fig. 2 Casted bar supporting maxillary upper removable partial denture.

Fig. 3 Titanium-milled bar.

Fig. 4 Spark erosion milled bar.

Fig. 5 Overdenture with a bilateral swivel.

Fig. 6 Full upper fixed crown and bridge.





**Fig. 7** Upper and lower fixed crown and bridge.

**Fig. 8** Upper fixed restoration.

the aid of the restorative dentist, a prosthetic plan is completed.

Parel's classification of the edentulous maxilla is useful for conceptualization of the prosthetic plan.

- 1) Class I maxilla is the patient who seems to be missing only the maxillary teeth, but has retained the alveolar bone almost to its original level.
- 2) Class II maxilla has lost the teeth and some of the alveolar bone.
- 3) Class III maxilla has lost the teeth and most of the alveolar bone to the basal level.

For the Class I, a fixed restoration, borne by implants, can be fabricated because the patient has adequate alveolar bone for support of the soft tissue and is missing only teeth. There is usually greater than 10 mm of bone height for both the anterior and posterior maxilla. For a fixed crown and bridge-type restoration, implants need to be placed within the confines of the teeth of the planned restoration.

The Class II patient is rarely aesthetically managed with a fixed crown and bridge prosthesis because they require the labial flange of the maxillary prosthesis to support the nasal-labial soft tissue.

A fixed crown and bridge, fixed/removable (spark erosion or milled prosthesis), or removable overdenture type prosthesis require at least 6–8 implants to adequately support a maxillary implant-borne prosthesis. The removable prosthesis requires placement of four implants placed into the anterior the anterior placement to support a bar, which has retentive vertical stress breaking attachments.

The prosthesis for the edentulous maxilla is usually fabricated with cross arch stabilization of the left and right implant.

### **Four implants (tissue-borne prosthesis)**

For an upper implant supported removable overdenture, a minimum of four implants are needed. Generally, when placing four implants for an overdenture, consideration should be given to the potential need for additional implants at a later time if the patient decides to change from a tissue-borne prosthesis to an implant-supported prosthesis. In preparation for a tissue-borne prosthesis, adequate bone should be present to allow the placement of four parallel implants that will support four Zest locators and will allow perfect draw of the overdenture (Fig. 1).

### **Placement of four implants into the anterior maxilla (bar-supported removable prosthesis)**

For the patient with adequate anterior vertical bone height and for whom a treatment plan has been made for anterior implants for over-denture support, four implants or more should be placed since any less will not predictably resist the forces placed on them. Two implants are contraindicated to retain a maxillary over denture. The bar can be casted (Fig. 2) or a titanium-milled structure (Fig. 3).

### **Placement of six to eight implants for implant-borne and supported overdenture**

If the goals of the patient are to have a denture/prosthesis that is palateless and does not depend on the tissues for support, a sufficient number of implants are required to resist the forces of mastication. In such instances, it is recommended that six to eight implants be used for an implant-supported fixed/removable prosthesis with adequate number of implants located posteriorly to support the molars. Six to eight implants in the anterior and posterior maxilla are used to support a



Fig. 9



Fig. 10



Fig. 11



Fig. 12

**Fig. 9** \_Three semi-precision attachment fixed restoration.

**Fig. 10** \_One year follow-up.

**Fig. 11** \_Extremely deficient maxilla.

**Fig. 12** \_Final fixed restoration.

**Fig. 13** \_Supra-frame screw retained.

**Fig. 14** \_Fixed prosthesis showing great facial reconstruction.

suprastructure for a totally implant-borne restoration with tissue contact only for speech (Figs. 4 & 5).

### **\_Fixed crown and bridge-type restoration**

Six to eight implants in the anterior and posterior maxilla are used to support a suprastructure for totally implant-borne cases. Implants are placed from the canine region extending posteriorly, with a minimum number of implants placed into the incisal region. This placement pattern makes the design of the anterior portion of the prosthesis easier (Fig. 6).

### **\_Placement of eight implants with sinus graft for a fixed crown and bridge-type restoration**

These patients have had treatment planning for an implant-borne restoration (crown and bridge type), yet they had insufficient vertical bone for the placement of implants in the posterior to the ca-

nines. The sinus graft can be performed as one surgery, followed by implant placement six to eight months later (Fig. 7). Alternately, the sinus graft can be performed and the implants placed at the time of the sinus graft (Figs. 8–10).

If the soft and hard tissue is extremely deficient (Fig. 11), the lost structures can be replaced by a supra-frame that will restore the vertical dimension and the teeth can be replaced with cemented on crowns (Figs. 12–14). This type of prosthesis allows great facial reconstruction and support.

*Editorial note: The literature list can be requested from the author.*

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Fig. 13



Fig. 14

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