

# Special Report 4

*Treating Clinicians: Drs. Roger Flake and Michael Cohen*



Figure 1

*Age at Initial Presentation: 37*  
*Initial Presentation: October 1997*  
*Active Treatment Completed: May 2000*

## Introduction and Background

With the ever-increasing need to phase treatment for both clinical and financial reasons, a new challenge has beset the surgical and restorative team. It is no longer just about where one wants to end up, but how one gets there as well. How does the surgical team handle transition?

This 37-year-old patient presented with missing teeth in the mandibular incisor region (fig. 1). She experienced a traumatic injury in her early twenties and lost teeth #'s 23-26. The oral surgeon at the time of the accident also noted extensive bone loss on the facial of teeth #'s 22 & 27 and contemplated extractions. Ultimately, he decided against it.

The patient could not afford a fixed bridge at that time and opted for a removable partial denture. She found it very cumbersome and was now ready to consider a fixed restoration.

## Pertinent Diagnostic Findings

Thorough examination revealed a "knife-like" edentulous ridge in the mandibular anterior region (fig. 2).



Figure 2

A steep overbite and minimal overjet was noted. The maxillary incisal plane was sloped, probably due to some super-eruption of the incisors as the lower denture teeth gradually wore down over a period of time. The periodontium was stable with no tooth mobility and probing depths were within normal limits. Radiographic findings, including a CT scan, revealed apparent advanced bone loss on the facial of teeth #'s 22 & 27.

## Diagnosis and Prognosis

The diagnosis consisted of generalized mild gingivitis, missing teeth #'s 23-26, a severely resorbed mandibular anterior edentulous ridge and Angle Class I occlusion with excessive overbite and minimal overjet. The prognosis for the overall dentition was good. Because of the radiographic lack of facial bone, the prognosis for teeth #'s 22 & 27 was guarded.

## Phase I: Initial Laboratory Preparation

Both aesthetics and function were the driving forces in planning the direction of the final restoration. A complete diagnostic wax-up was utilized to establish ideal tooth and tissue position, satisfying the needs and wants of the patient and the restorative team. One of the challenges in treating this patient was the lack of both hard and soft



Figure 3

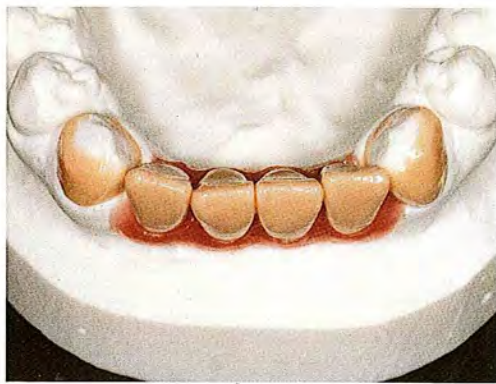


Figure 4

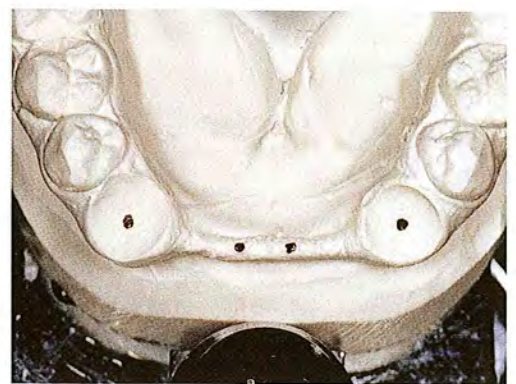


Figure 5

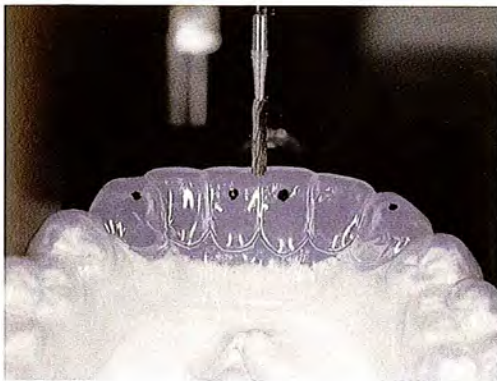


Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11

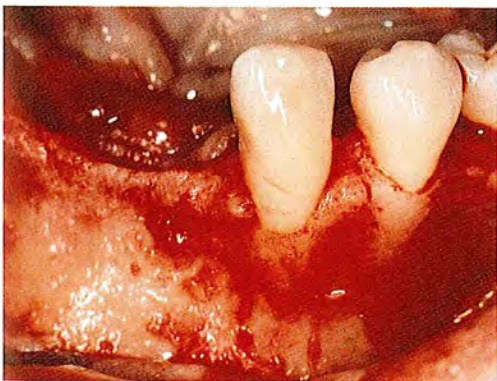


Figure 12

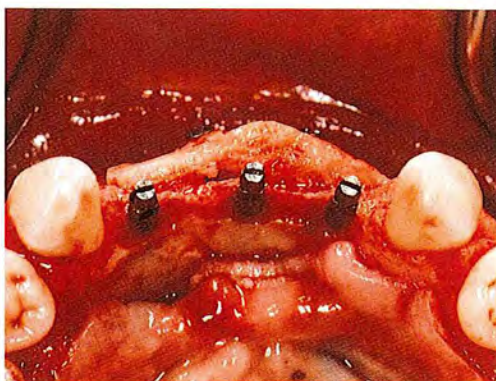


Figure 13

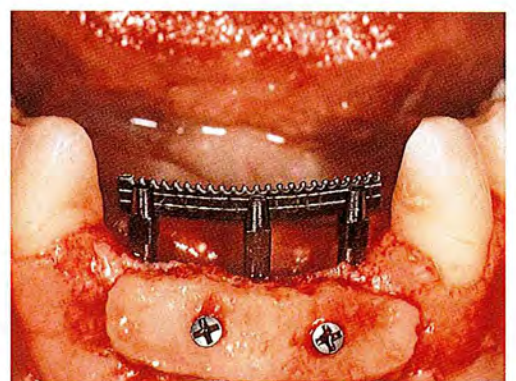
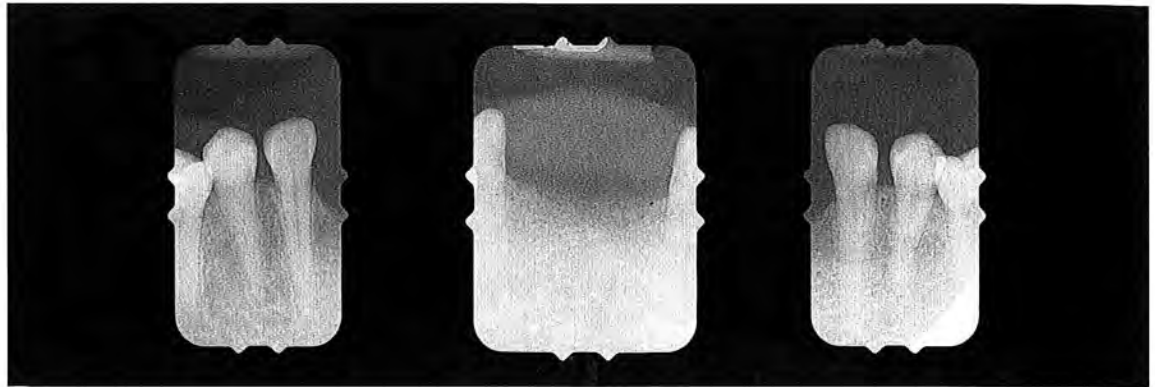
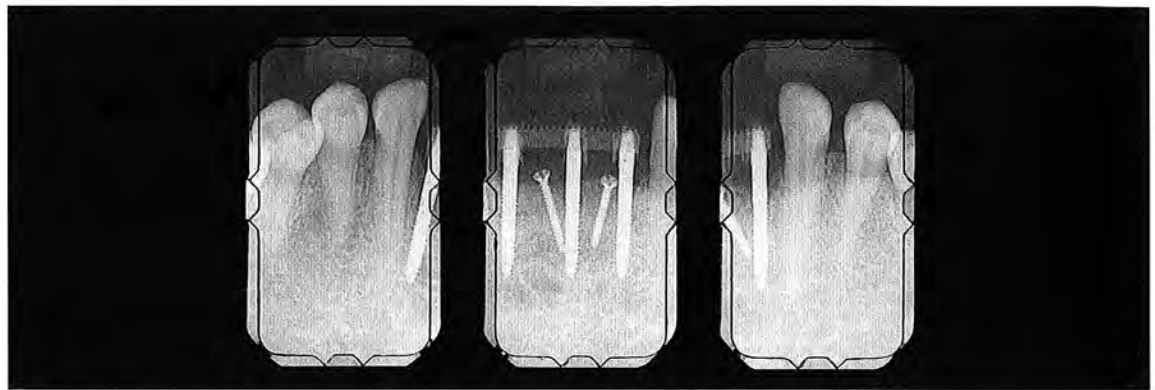


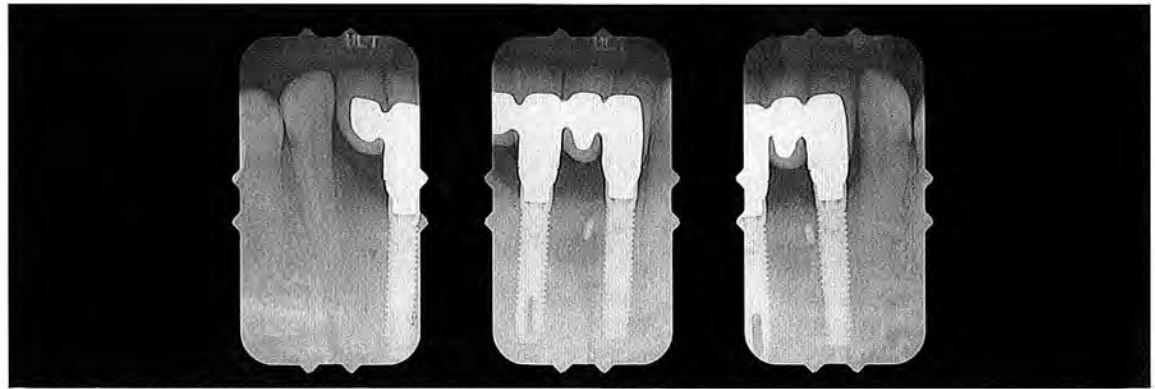
Figure 14



Initial radiographs - 1997



Bone fixation screws and mini-translational implants - 1998



Final implant-supported restoration - 2000

tissue. We started with a wax-up to establish ideal tooth position and contour and then added wax to fill in where bone and soft tissue support had been lost (figs. 3-4). This allowed the team to confer on the diagnostic findings, facilitating coordination of the surgical and restorative treatment.

The decision was then made on the number and locations for dental implants.

CT scan analysis confirmed significant bone loss on the facial of teeth #'s 22 & 27. It was decided that these teeth would be extracted at the time of implant placement. The plan was to place four implants in the area of missing teeth #'s 22, 24, 25 & 27. On a duplicate diagnostic model, marks for implant placement were made (fig. 5). The black dots show where the permanent

implants would be, giving the technician the best opportunity to provide the most aesthetic restorations.

On an Omnivac shell (Superdent, Darby Dental) of the diagnostic wax-up, marks were placed noting the ideal spots for the implant access holes. The shell was then placed on a second model. This model with the marked shell was placed on a milling machine set at the appropriate angle to connect the apical and tissue level markings for ideal implant placement and angulation (fig. 6).

A third model was made with the tissue level preserved but teeth removed. A surgical template was fabricated by placing the Omnivac shell on this model and filling it with acrylic (Ivoclar Cold-Cure Clear, Williams Dental), leaving the holes in the areas already established (fig. 7). This provided a more rigid surgical guide that would be utilized both at the time of bone grafting and dental implant placement.

The initial surgical template was designed for two implants placed in the #'s 24 & 25 sites and the #'s 22 & 27 sites as immediate implants (fig. 7). A second template was constructed in the same manner as the first, but with four access holes positioned so as not to conflict with restorations or permanent implant sites (fig. 8). The second surgical guide was fabricated to conform to the sites intended for mini transitional implants (MTI implants, Dentatus) and access holes were appropriately sized.

### **Phase II: Bone Grafting Surgery**

Surgical entry was made to expose the mandibular right and left canines for extraction and to harvest a symphyseal monocortical block graft to augment the edentulous ridge in the #'s 23-26 area (figs. 9-10).

The first feature noted was that, contrary to CT scan analysis, a thin plate of bone existed on the facial of teeth

#'s 22 & 27 (figs. 11-12). It was immediately decided to retain these teeth and therefore, a new surgical design with altered transitional implant placement was contemplated. It was decided to utilize two fixation screws for the monocortical block graft and to place three transitional implants in the #'s 23-26 area (figs. 13-14). Placement was far to the lingual so as to allow room for eventual permanent implant placement.

Once the transitional implants were in place, the restoring dentist fabricated a chairside provisional acrylic restoration on these implants (fig. 15). This eliminated the need to wear a removable appliance and provided an immediate provisional fixed restoration. The patient always had replacement teeth and did not experience even a short healing period without teeth. Records were taken shortly afterwards to fabricate a more aesthetic provisional restoration in the laboratory (figs. 16-17).

### **Phase III: Fabrication of the Provisional Restoration**

Using the guide for the placement of the transitional implants, lab analogs were jumped into the altered third model (fig. 18). The splinting bar was placed and the lingual shell seated (fig. 19). Finally, the copings were placed over the transitional implants and the provisional shell was resealed (fig. 20). This provided all the information needed to fabricate the lab-processed provisional restoration (figs. 21-22).

### **Phase IV: Surgical Entry for Implant Placement**

Surgical entry was made for implant placement. Initially, the new restorative design included the placement of two implants in the #'s 23 & 26 areas. The implant in the # 23 area was inserted. At the time of insertion in the # 26 area, some of the graft separated, making it impossible to insert the implant. Instead, an



Figure 15

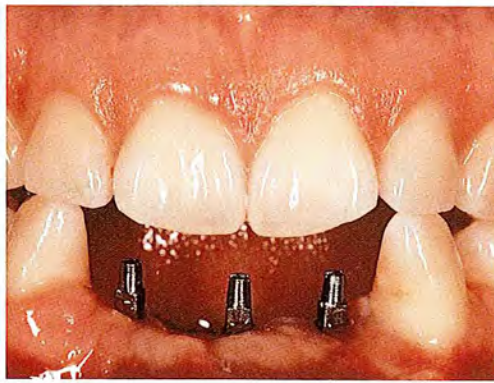


Figure 16



Figure 17



Figure 18



Figure 19



Figure 20



Figure 21



Figure 22

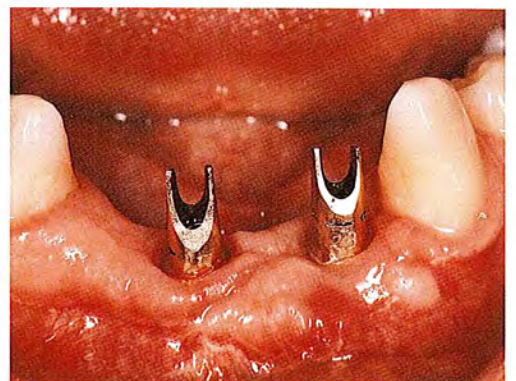


Figure 23

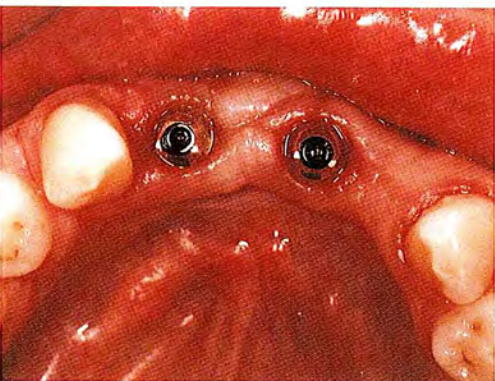


Figure 24



Figure 25



Figure 26

implant was placed in the # 25 area. This would eventually provide for an implant-supported bridge with cantilevered tooth # 26. Soft tissue grafting was performed six weeks after implant placement to augment the ridge where a soft tissue defect was noted. Transitional implants were left in place until permanent implant uncovering. The implants were uncovered approximately three months after placement, the transitional implants were removed and provisional restorations were fabricated (figs. 23-24).

### **Phase V: Final Restoration**

After a brief healing period of several weeks, impressions were taken and the final PFM restoration was fabricated (figs. 25-26). Implants #'s 23 & 25 serve as retainers, # 24 is a pontic and # 26 is a cantilever.

### **Commentary**

1. The fact that teeth #'s 22 & 27 were planned for extraction but were ultimately maintained radically altered the treatment plan. The clinicians and technician, all of whom were present for all surgical procedures, were forced to make "battle field" decisions during both main surgeries. The meticulously designed surgical templates, one for transitional implant placement and one for permanent implant placement, were rendered useless. The bone graft and transitional implant placement had to be executed based on the surgeon's skill and experience without guidance from a template.

2. An important lesson to be learned from this case is to never become involved in treatment with our "backs against the wall." If one minor change or unexpected complication prevents us from delivering a satisfying result to the patient, we are setting up ourselves and the patient for a potential huge disappointment. In this case, a significant change in the treatment plan and a moderately serious complication nevertheless still allowed for a functional, aesthetic and completely satisfying result. Flexibility must exist within a given treatment plan to permit variation from the original design, yet achieve the predetermined goals and objectives.

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