An Artful Solution for Implant Prosthesis
A long-suffering patient benefits from dentist-technician collaboration
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Collaboration, commitment, patience, and perseverance—these factors in combination create a recipe for successful outcomes. They are also necessary to help restoring dentists achieve perfection of their specialty, although sometimes the realization of this goal is complicated by a host of variables.

A young female patient presented following a traumatic motor scooter accident that left her without anterior teeth No. 9 through No. 11 and class IV fractures of No. 7 and No. 8. The patient’s existing malocclusion and her narrow arch form further complicated her treatment outcome. Unfortunately, she refused any orthodontic treatment.

Having endured a lengthy healing process with the initial trauma of the accident, along with the successive surgeries, the apprehensive patient was anxious to bring her treatment to an end. Although the goal for optimal results was to restore form and function for this young patient, the difficult surgical outcomes and the traumatizing ordeal of the accident itself would present future treatment challenges for both the patient and the doctor.

The patient presented with three dental implants placed for teeth No. 9 through No. 11 and was wearing a temporary removable prosthesis (Figure 1).

Restorative Challenges
Some of the restorative concerns in this case included:
• Significant hard and soft tissue loss in sites No. 9 through No. 11, requiring an FP-3 type of restoration.
• Midline deviation.
• An asymmetrical lower lip line.
• Unaddressed malocclusion and a collapsed buccal corridor (Figure 2).

Consideration for the placement of the implants required careful treatment planning for the implant prosthesis. Because an FP-3 prosthesis was being fabricated due to insufficient bone height, the three implants were placed to maximize stability in available bone. According to the implant principles of Carl Misch, the anatomy of the maxilla places significant constraints on the ability to surgically place root-form implants suitable for loading along their long axis. The maxillary anterior region does not permit an ideal implant position, even under ideal conditions.

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Force magnification increases the stress beyond the usual condition of load, such as a crown height greater than normal. Multiple force magnifiers, such as a patient with parafunctional habits and an excessive crown height, may exceed the capability of any dental implant to withstand occlusal loads. Therefore, careful consideration was given to the patient’s occlusion. Greater crown heights
create greater moment on the implant and the incisal edge position.³

Clinical Protocol
The patient elected to improve the symmetry of her smile line; teeth No. 6 though No. 8 were prepared for zirconia crowns. (Note that No. 7 and No. 8 had significant class IV fractures that were direct bonded during the healing phase of her treatment.) The tissue was slightly recontoured around No. 7 and No. 8 before being prepped on the model (Figure 3). A diagnostic wax-up was created showing the additions of tissue-colored porcelain placement on the implant prosthesis (Figure 4). The final gingival margins of No. 9 through No. 11 were developed in ceramic to create an esthetic pattern.⁴

A gingival porcelain shade was selected to match the areas along the implant prosthesis, extending into the height of the buccal vestibule. The gingival porcelain created the illusion of tissue while adding additional support and allowing the crown height to remain bilaterally symmetrical (Figure 5).

Tooth color was selected considering the surrounding dentition for an esthetic blend of hue and saturation (Figure 6). Now the dental laboratory could begin fabricating the case. The zirconia substructure was milled from a zirconia block (Amann Girrbach, www.amanngirrbach.com/us) that included the support for the gingiva-colored porcelain and GC Initial™ (GC America, www.gcamerica.com) zirconia porcelain used for the layering process (Figure 7). The mirror image shows the three-unit splinted, screw-retained implant prosthesis substructure and prepared single tooth restorations. Additionally, the

FABRICATION
(3.) Symmetry of tissue is planned and tissue recontoured on the model. (4.) Diagnostic wax-up is completed on the model, including full restorative plan. (5.) Gum shade is chosen for gingival porcelain additions to implant prosthesis. (6.) Selected shade is compared with surrounding dentition for accurate translucency. (7.) Milled zirconia implant substructure is fit onto model. (8.) Occlusal view of arch assessed for single-unit restorations and implant substructure alignment. (9.) Dentin porcelain was applied to single zirconia units and base gingival porcelain shade added to implant prosthesis to try on the model. (10.) Enamel was added for further anatomic development. (11.) The final prostheses are completed.
tooth symmetry of teeth No. 6 through No. 8, viewed lingually, shows a harmonious esthetic solution by drawing the arch in line (Figure 8).

With the preliminary porcelain structure built, the restorations were tried on the model, reviewing the gingival tissue height incisally for an esthetic match of teeth No. 9 and No 10 (Figure 9). The enamel layer was anatomically developed to full emergent specifications and the gingival porcelain additions were approximated to fill in the full buccal height (Figure 10). Finally, the prosthesis was completed with the characterized gingival porcelain and the natural transition of color from the cervical depth all the way to the translucent incisal aspects (Figure 9 through Figure 11).

The try-in of the implant prosthesis, along with the single lateral crown, showed the color match between the gingival porcelain with the patient's natural tissue shade and the stump shade of the prepared teeth (Figure 12). With dentition dried and restorations fully seated, the morphology and texture of the teeth complement the natural surrounding dentition (Figure 13). Occlusal height was reduced to ensure only light contact in protrusive and excursive movements (Figure 14). The facial view with hydrated teeth shows balance of gingival symmetry, more harmonious length-to-width proportions, and more properly aligned anterior teeth (Figure 15).

**Conclusion**

Although the duration of restorative treatment was more than 18 months, the outcome ultimately exceeded the esthetic expectations of the patient. She had endured a traumatic accident requiring extensive surgeries that complicated her case. Preparing treatment options that would accomplish the return of normal function while respecting the limitations of the patient's anxiety and apprehension required compassionate consideration. With the careful collaboration of treatment planning and design, the restorative dentist and the dental ceramist provided an artistic solution to overcome a variety of dental complications. Some practitioners would have decidedly not taken on a case with this level of complexity. It is the perseverance, patience, and commitment to their craft, and the lengths they will go to produce a successful outcome, that defines practitioners.

**References**


**Fig. 12** Right view shows lateral incisor and implant prosthesis seated in patient’s mouth.

**Fig. 13** Try-in of restorations without hydration to teeth.

**Fig. 14** Left view shows gingival porcelain blends naturally and papilla anatomy with the lip relaxed.

**Fig. 15** Frontal view with teeth hydrated shows smile line esthetics and harmony.