

# Complex Anterior Treatment

## *A Case Report*



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Numerous innovations in dental materials and techniques have dramatically changed modern dental practice. In addition, the predictability of dental implants and tissue regeneration has greatly influenced diagnosis and treatment planning. Consequently, a clinician can be confounded by the many valid treatment options. Oftentimes, the selected treatment is based on financial factors, insurance coverage, and time as well as the clinician's training, comfort zone, and available referral sources. This article will illustrate one method of solving a complex esthetic puzzle using periodontal plastic surgery to complement prosthetic rehabilitation.

### Case Presentation

A 50-year-old man of good overall health presented to the office with a complaint of the greatly compromised appearance of his upper anteriors (Figure 1). Examination revealed that tooth No. 8 was missing and tooth No. 7 had a composite veneer to make it appear as a central incisor. In addition, tooth No. 9 had a severe facial periodontal defect (Figure 2). The patient stated that he was seeking to improve his appearance with minimal cost in time and money, not a "Hollywood smile."

To arrive at a proper treatment plan in such a complex case, all neces-

sary radiographs, photographs, and mounted models were taken and carefully analyzed. In this treatment plan, the root of tooth No. 9 would be covered with an acellular grafting material, Alloderm (BioHorizons, Inc), to help correct the severe recession. The crown of tooth No. 7 would be lengthened, and new crowns would be placed on teeth Nos. 6 (to emulate a lateral incisor), 7 (to mimic a central incisor), 9, and 10, respectively.

Before proceeding with any treatment, the patient was invited back for an in-depth discussion of the expected outcome. The patient was informed that it would be impossible to achieve an ideal result because teeth Nos. 6 and 7 had previously been repositioned. Fortunately, the patient's existing low smile line would help mask any final restorative imperfections.

After careful analysis of the patient's gingival and osseous architecture, including information gathered from probing depth records and radiographs, a surgical guide was made from the diagnostic model to help with the soft-tissue surgical phase of the treatment. In cases such as this, a diagnostic model not only gives a glimpse of the eventual prosthodontic restorations, but also provides crucial information and guidance on the desirable soft-tissue appearance at the end of treatment.

After discussing the treatment phases, costs, and time with the patient, he was appointed for the periodontal plastic surgery phase. After verbal review of the procedure and pre-medication (patient was to start taking amoxicillin 875 mg *b.i.d.*, 48 hours before and dexamethasone 4 mg, 24 hours before), all consent forms were given to the patient, reviewed, and signed. The patient was then given two 200 mg tablets of ibuprofen and was instructed to rinse with chlorhexidine 0.12% for 60 seconds. Vital signs, including oxygen saturation, were taken and monitored with an electronic blood pressure monitor. The patient was then draped for surgery with hair cover and disposable gown. The perioral area was then scrubbed with chlorhexidine 0.12%. Following topical anesthesia, 4% Citanest Plain (Dentsply Pharmaceutical) was given for comfort and preliminary anesthesia. Marcaine 0.5% with 1:200,000 epinephrine (Abbott Laboratories) was then administered for more profound anesthesia.

The procedure was initiated with coronoplasty of the defective crown on tooth No. 9 to allow full and passive insertion of the clear surgical stent so that an outline of the desired gingival margins on teeth Nos. 7 and 9 could be visualized in situ. This step helped finalize how much crown



**Figure 1**—Pretreatment smile view showing compromised appearance.



**Figure 2**—Pretreatment view showing severe facial perioesthetic defect.



**Figure 3**—Retracted view, flap elevated.



**Figure 4**—Retracted view, Alloderm in place.



**Figure 5**—Retracted view, flap re-approximated and sutured.



**Figure 6**—Retracted view, 12 weeks after surgery, showing good healing.

lengthening would be needed on tooth No. 7 and how much graft volume would be needed for tooth No. 9. After this, the gingivectomy was carried out with a Bard-Parker blade No.15C (BD) on tooth No. 7. Then the flap was reflected to ascertain the location of the osseous crest of tooth No. 7, in case any osseous resection was necessary not to violate the biologic width.

After the flap had been adequately reflected to allow access to tooth No. 9 (Figure 3), the root was scaled with hand instruments and then treated with citric acid. The acellular dermal graft material was rehydrated for 10 minutes in a sterile saline bath.<sup>1</sup> After proper trimming, the graft was placed in the surgical site and adapted to the root of tooth No. 9 and adjacent crestal bone

(Figure 4). The use of an acellular dermal graft helps eliminate the requirement for palatal donor tissue or other intraoral tissue harvesting. This choice of graft material helps reduce chair time, thus avoiding additional discomfort to the patient and is, therefore, a useful method for root coverage.<sup>2-9</sup> The flap was then repositioned and evaluated for passivity with no tension when the incision lines were approximated. Additional reflection with scoring of the periosteum ensured proper and tension-free flap coverage of the surgical area. The flap was then sutured with 5-0 vicryl (Ethicon, Inc). A sling suture with 6-0 gut also was added onto the facial marginal gingiva of tooth No. 9 to further ensure graft immobilization, which is crucial for the survival and incorporation of the

graft (Figure 5).<sup>10-12</sup> Gauze soaked with saline then was placed onto the surgical area with light pressure for 15 minutes to help achieve initial stabilization and clotting.

The patient was slowly seated upright, and postoperative instructions were reviewed with special emphasis on rinsing with chlorhexidine 0.12% *b.i.d.* and warm salt water as often as possible. In addition, a supply of microbrushes and instructions on their correct usage was given to the patient so that only a microbrush soaked with chlorhexidine 0.12% would be used in the surgical area for the next 10 days when the patient was scheduled for a postoperative check-up and suture removal.

After a waiting period of 3 months for proper healing (Figures 6 and 7), the patient was appointed for



**Figure 7**—Occlusal view, 12 weeks after surgery, showing good tissue volume around tooth No. 9.



**Figure 8**—Occlusal view of the preparations on teeth Nos. 6 through 10. Note the proper healing of the graft and the esthetic complexity of case.



**Figure 9**—Retracted view of provisional crowns on teeth Nos. 6 through 10.



**Figure 10**—The final crowns on the model showing the technician's skill in compensating for the size discrepancy between teeth Nos. 7 and 9.



**Figure 11**—Palatal view of the crowns on the model.



**Figure 12**—Full smile view, immediately after cementation.

the prosthetic treatment phase, during which teeth Nos. 6, 7, 9, and 10 were prepared for full crowns with the goal of making tooth No. 6 resemble a lateral incisor and No. 7 look like a central incisor (Figure 8). Retraction cords, Gingi-BRAID 000 and 00 (Dux Dental), were packed for 10 minutes, the 00 cords were removed, and an impression was made with a custom tray and a polyvinyl siloxane impression material (Imprint Garant, 3M ESPE). After a good impression had been obtained, the custom tray for the fabrication of the provisional crowns was loaded with Integrity temporary material (Dentsply Caulk) and inserted over the preparations.

After the provisionals had been properly shaped and polished, they were set aside. At this point, the patient was seated upright and posterior bite

and anterior stick-bite impressions were obtained. A facebow transfer also was acquired. The provisional crowns were then cemented temporarily with TempBond Clear (Kerr Corporation). After the removal of excess cement and the retraction cords, the occlusion was checked and adjusted with the patient seated upright.

The patient was appointed for a refinement visit, during which the provisionals were touched up. After the patient had approved the fit and appearance of the provisional crowns, photographs were taken and alginate impressions were made (Figure 9) to be enclosed with the case for the ceramist. Measurements of the length of the centrals also were documented, and the patient's consent to have the treatment completed was obtained.

Before the crowns were received from the laboratory, the patient requested to have his teeth bleached. Normally, this step is done before the crown preparation step, but at times, the clinician must work around the patient's sudden desire. The patient was appointed for in-office bleaching with the Zoom! Advanced Power system (Discus Dental). Alginate impressions were made to fabricate at-home bleaching trays. While the patient's teeth were being whitened in-office, the impressions were poured and the bleaching trays were made. Opalescence PF 20% (Ultradent Inc) bleaching gel was dispensed with proper instruction for home use. The patient was then appointed for a shade-taking visit.

At the crown-delivery appointment, the vital signs were acquired and



**Figure 13**—Retracted view, final crowns immediately after cementation.



**Figure 14**—Palatal view, final crowns.

documented, and the procedure was reviewed again with the patient. Before anesthesia administration, the crowns were shown to the patient to have his preliminary approval of the forms and shades (Figures 10 and 11).

After local anesthesia with Citanest Plain (Dentsply Pharmaceutical) and Xylocaine 2% with 1:100,000 epinephrine (Dentsply Pharmaceutical), the temporary crowns were removed and the porcelain crowns were tried in. The patient was given a hand mirror to evaluate the appearance of the crowns in place.

After approval for cementation was obtained, the crowns were checked for proper fit, interproximal contact, and marginal seal. Because the crowns were ceramometallic, rubber dam isolation was not necessary. The working area was isolated with cotton rolls and the preparations were cleaned with Tubulicid

Red (Global Dental Products) before being coated with Gluma Desensitizer (Heraeus Kulzer, Inc). The crowns were then blasted with aluminum oxide, rinsed, cleaned with alcohol, dried, and were cemented with RelyX Unicem (3M ESPE). After all excess cement was cleaned off, the patient was seated upright and the occlusion was checked and adjusted. Proper centric occlusion, cuspid, and protrusive guidance were verified (Figures 12 through 14). The patient was given detailed instructions on proper care and maintenance of the crowns to ensure longevity. He was then appointed for a postdelivery check-up and final photographs. At that appointment, the patient expressed his happiness with the final result.

### Conclusion

Complex dental rehabilitation poses many unique challenges to clinicians. It tests one's knowledge, training, integrity, and artistic ability. With the variety of treatment options currently available, treatment plans can vary from office to office. Differences in training, philosophy, degree of financial motivation, and esthetic perception by the dentist as well as the patient also can affect treatment plans. Further, the patient's personality, financial concerns, and personal situation also come into play. Nonetheless, with today's esthetic demand from the public as well as great advancement in tissue engineering, clinicians should consider regenerative periodontics before extracting teeth and communicate this option to their patients.<sup>13</sup> ©

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## Product References

**Product:** Alloderm  
**Manufacturer:** BioHorizons, Inc  
**Location:** Birmingham, Alabama  
**Phone:** 205.967.7880  
**Web site:** www.biohorizons.com

**Products:** 4% Citanest Plain, Citanest Plain, Xylocaine 2% with 1:100,000 epinephrine  
**Manufacturer:** Dentsply Pharmaceutical  
**Location:** York, Pennsylvania  
**Phone:** 800.225.2787  
**Web site:** www.dentsplypharma.com

**Product:** Marcaine 0.5% with 1:200,000 epinephrine  
**Manufacturer:** Abbott Laboratories  
**Location:** Abbott Park, Illinois  
**Web site:** www.abbott.us

**Product:** Bard-Parker blade No.15C  
**Manufacturer:** BD  
**Location:** Franklin Lakes, New Jersey  
**Phone:** 201.847.6800  
**Web site:** www.bd.com

**Product:** 5-0 vicryl suture  
**Manufacturer:** Ethicon, Inc  
**Location:** Somerville, New Jersey  
**Web site:** www.ethicon.com

**Products:** Retraction cord, GingiBRAID 000 and 00  
**Manufacturer:** Dux Dental  
**Location:** Oxnard, California  
**Phone:** 800.833.8267  
**Web site:** www.duxdental.com

**Products:** Imprint Garant, RelyX Unicem  
**Manufacturer:** 3M ESPE  
**Location:** St. Paul, Minnesota  
**Phone:** 888.364.3577  
**Web site:** www.3m.com/dental

**Product:** Integrity  
**Manufacturer:** Dentsply Caulk  
**Location:** Milford, Delaware  
**Phone:** 800.532.2855  
**Web site:** www.caulk.com

**Product:** TempBond Clear  
**Manufacturer:** Kerr Corporation  
**Location:** Orange, California  
**Phone:** 800.537.7123  
**Web site:** www.kerrdental.com

**Product:** Zoom! Advanced Power system  
**Manufacturer:** Discus Dental  
**Location:** Culver City, California  
**Phone:** 800.422.9448  
**Web site:** www.discusdental.com

**Product:** Opalescence PF 20%  
**Manufacturer:** Ultradent, Inc  
**Location:** South Jordan, Utah  
**Phone:** 888.230.1420  
**Web site:** www.ultradent.com

**Product:** Tubulicid Red  
**Manufacturer:** Global Dental Products  
**Location:** North Bellmore, New York  
**Phone:** 516.221.8844  
**Web site:** www.gdpdental.com

**Product:** Gluma Desensitizer  
**Manufacturer:** Heraeus Kulzer, Inc  
**Location:** Armonk, New York  
**Phone:** 800.431.1785  
**Web site:** www.heraeus-kulzer-us.com