CBCT and implants: a career-altering experience

By Steven A. Guttenberg, DDS, MD

With all the technology available to dental practitioners today, very few can be described as “career altering.” One of my original reasons for investing in a cone-beam computed tomography (CBCT) scanner was to assist with the complete evaluation of dental implant sites.

A major concern during implant placement is the possibility of placing an implant too close to or penetrating the inferior alveolar nerve canal, likely resulting in injuries such as paresthesia, anesthesia or dysesthesia. In preparation for the insertion of fixtures, I wanted to be able to appropriately visualize important anatomic landmarks.

Treatment plan
1. Extraction of teeth #8 and #9, immediate implantation of #8 and #9 and immediate non-functional provisionalization of #8 and #9.
2. Three-month healing period.
3. Gingivectomy to create mucosal symmetry.
4. Six-month healing period, during which contour adjustments to interim restoration will be made to manipulate papillary regeneration.
5. Placement of final single PFM crowns on implants #8 and #9.

Treatment plan rationale
Implant rehabilitation for sites #8 and #9 boosts long-term prosthetic success, which diminishes future costs and permits more future restorability options. The patient is an ideal candidate for immediate implant placement and temporization because of her thick biotype, which resists recession, as well as the inherent coronal positioning of the gingival drape around #8 and #9 compared to the adjacent teeth, which allows any minor recession post-treatment to remain within esthetically pleasing bounds.

Extraction of teeth #8 and #9, immediate placement of implants #8 and #9 and immediate non-functional provisionalization of #8 and #9

After oral sedation with 0.25 mg triazolam and local anesthetic induction using 2 percent lidocaine with 1:100,000 epinephrine and 0.5 percent bupivacaine with 1:200,000 epinephrine, sulcular incisions were made circumferentially around teeth #8 and #9.

To create room for extraction instructions, the crowns on teeth #8 and #9 were reduced (Fig. 2a). Teeth #8 and #9 were extracted atraumatically using a piezosurgical insert and serrated universal maxillary forceps.

Fig. 1a: Initial facial view. (Photo/Provided by Dr. Michael Sonick)

Esthetic management of adjacent maxillary central incisors
Extraction, immediate placement and immediate provisionalization

By Michael Sonick DMD

Periodontist: Dr. Michael Sonick
Restorative Dentist: Dr. Patrice Foudy

Patient history
A medically and periodontally stable 50-year old woman presented with failing #8 and #9 teeth that exhibit asymmetry, lack of interdental papilla and a history of failing root-canal therapy and apicoectomy (Fig. 1).

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To create room for extraction instructions, the crowns on teeth #8 and #9 were reduced (Fig. 2a). Teeth #8 and #9 were extracted atraumatically using a piezosurgical insert and serrated universal maxillary forceps.
Degranulation of the sockets was performed using a carbide finishing bur and Neumeyer bur. A surgical guide was used to prepare the implant osteotomies, and proper positioning was attained (Fig. 5). After finalization of the osteotomy sites, rough-surfaced, internal hex 4 mm (diameter) × 15 mm (length) implants were placed into the #8 and #9 sites (NanoTite® Tapered Certain® Implant, BIOMET 3i, Palm Beach Gardens, Fla.) (Fig. 4).

Healing abutments were placed on the implants to prevent soft-tissue and bony collapse during the period that extraoral fabrication of the temporary prostheses occurred (Fig. 5a). The orientation of the implants was ideal, and the fixtures exited from the sockets at the cingulum positions (Fig. 5a). Primary stability was achieved. Radiographic review of the implants revealed a peak of bone between the fixtures, an inter-implant distance of greater than 4 mm and an implant-tooth distance of 2 mm (Fig. 5b). To bridge the circumferential gap between the socket walls and the implant surfaces, freeze-dried bone allograft (FDBA) was used as graft material (LifeNet Health, Virginia Beach, Va.).

Temporary cylinders (Pre-Formance® Temporary Cylinder, Certain Internal Connection, 4.1 mm platform, hexed) were placed on the implants to check the restorative position (Fig. 6). These were removed, and an implant-level pick-up impression was taken. After chairside creation of a cast...
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• Filling of extraction sockets
• Elevating the maxillary sinus floor
• Filling of peri-implant defects
with implant analogs, the hexed temporary cylinders were connected to the analogs and acrylic resin interim crowns were fabricated using a vacuum-formed template made over ideally shaped central incisors. The resin interim crowns were seated and screwed onto the implants using hexed titanium screws with 20 Ncm torque. Cotton pellets were placed over the screw heads, and the access holes were sealed with composite resin. Occlusal adjustment prevented functional contact upon excursions. The interim restorations did not fill the papillary space between #8 and #9 (Fig. 7). A radiograph taken following completion of provisionalization demonstrated satisfactory positioning and seating (Fig. 8).

Gingivectomy over implants #8 and #9
Healing of the implant sites proceeded without incident. At one week post-surgery, the buccal marginal tissue remained coronally-oriented and encroachment of the papilla into the unfilled interdental space began (Fig. 9). Three months after initial surgery, further coronal displacement and papilla fill occurred.

Fig. 1a: Initial radiograph. Teeth #8 and #9 are failing endodontically.

Fig. 2a: Contact points are broken and the crowns are removed. Trauma to the bone and adjacent teeth is to be avoided.

Fig. 2b: Following a subcrestal incision, piezosurgery is used to atraumatically remove the teeth.

Fig. 2c: Utilizing beaked serrated forceps and rotational apical pressure, tooth #8 is removed without any destruction to the alveolar plate.

Fig. 3a: A surgical guide is used to ensure correct orientation during osteotomy preparation. Buccal view of the guide in place with orientation pins is shown.
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Minor gingivectomy was performed to create mucosal symmetry between the maxillary central incisors. The contact point and contour of the interim crowns were also adjusted to create a fuller papilla.

**Final restoration of implants #8 and #9**

Six months after gingivectomy and provisional contour modification, the implants were ready for final prostheses (Fig. 11). Single final PFM crowns were placed on implants #8 and #9. Clinical analysis demonstrated resolution of inflammation.
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idealization of the soft-tissue drape and papillary regeneration (Fig. 12).
A radiograph illustrated preservation of interproximal and peri-implant bone (Fig. 13). The patient was satisfied with the functional and esthetic results (Fig. 14).

**Post-operative instructions**
After each surgical procedure, the patient was instructed to take ibuprofen 600 mg q4-6 hours, hydrocodone 7.5 mg/acetaminophen 750 mg q4-6 hours prn pain and doxycycline.
Fig. 12d: Left lateral final view.

Fig. 13: Radiograph of final restoration. There is preservation of interproximal and peri-implant bone.

Fig. 14: Final facial view.

100 mg qd for 10 days. The patient was instructed not to brush at or near the surgical site but instead to rinse with 0.12 percent chlorhexidine or warm saline twice daily. The patient was also directed not to chew in the affected area for at least two weeks.

Dr. Michael Sonick is a full-time practicing periodontist and implant surgeon in Fairfield, Conn. A renowned educator, author and clinical researcher, he is a guest lecturer for the International Dental Program at New York University School of Dentistry, a former clinical assistant professor in the department of surgery at Yale University School of Medicine and University of Connecticut School of Dental Medicine and a frequent lecturer on periodontics, implants and practice management. He is the founder and director of the Fairfield County Dental Club, an advanced continuing education organization that provides courses on dentistry's latest developments. He is also founder and director of Sonick Seminars, a multidisciplinary teaching institute. Courses are given on all surgical aspects of periodontics and implant dentistry. For more information, call (203) 254-2006 or visit www.sonickdmd.com.

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