Today, patients increasingly present with endodontically treated teeth that have failed for various reasons—fracture, recurrent caries, or periodontal problems. In the past, the common dental treatment would be to prepare the adjacent teeth for a three-unit bridge. However, with implant therapy gaining more popularity among patients and providers, the request to have implant treatment has increased. It is my opinion that implant tooth replacement is the standard of care, and every dental provider needs to learn how to replace missing teeth using this modality at some level. This article discusses the steps taken to remove a non-restorable tooth, graft the area, and then replace it with an implant and corresponding abutment and crown restoration.

A 44-year-old woman presented with a severely broken down maxillary right first premolar (tooth No. 5) (Figure 1). The decay, already present in this tooth, had extended far below the free gingival margin to the crest of bone and into the furcation. All risks, benefits, and alternatives were reviewed with the patient regarding treatment. The patient understood that the tooth would need to be extracted; however, she did not want a bridge restoration for the final prosthesis. Instead, she insisted on having the tooth extracted, and the area grafted followed by implant placement and restoration. The patient’s medical history was non-contributory.

Once the patient was fully anesthetized, the gingival tissue was slightly reflected with a mucoperiosteal elevator to separate the attachment. With the handles of the Physics® Forceps (Golden Dental Solutions) wide open, the beak was set into the depth of the lingual or palatal sulcus on solid root surface. A secure purchase point on solid root surface was critical to successfully rolling out the tooth. When necessary, it is not uncommon to create a small trench with a small, flame-shaped diamond bur to engage the beak more securely on solid root surface. Once the beak was placed, the bumper was positioned on the alveolar ridge at the approximate location of the mucogingival junction to balance the beak. In other words, the beak grasps the tooth, while the bumper is the fulcrum to provide leverage and stability for the beak and wrist movement.

Using only wrist movement, a steady and gentle pressure was applied toward the buccal utilizing the Physics Forceps. Approximately within 30-60 seconds, the internal force or “creep” built up allowing the bone to slowly expand and the periodontal ligament to release. Once the tooth disengaged from the socket, the tooth was removed with a maxillary forceps (Figure 2). Bone grafting material (Foundation™, J Morita) was placed into the socket (Figure 3) and sutured (Figure 4) to prevent any dislodgement. The surrounding cells and capillaries infiltrate Foundation. As the extraction socket heals, it is filled with new augmented bone. Foundation is shaped in “bullet” form for easy placement. It is available in both small and medium sizes.

Approximately 12 weeks after healing, the area was inspected (Figure 5) and a new radiograph was taken to visualize the underlying bone. There was adequate width and height to
place an implant that would replicate the premolar using a 3.75 mm x 13 mm I5 (AB Dental USA) dental implant.

A 2.0 mm pilot drill was placed into the site and advanced to a depth of 15 mm measuring from the tissue surface. This additional 2 mm was the same depth of the tissue height to bone. In other words, 13 mm for the osteotomy in bone and 2 mm for tissue thickness was created to place a 13 mm long implant. A parallel pin gauge was placed in the site of the osteotomy, and an x-ray taken to check the angulations of the pin between the adjacent teeth within the maxilla. Using a rotary tissue punch, a 4 mm outline was created over the initial osteotomy and the tissue plug removed with a curette. Intermediate drills were sequentially utilized to increase the size of the final osteotomy. Once completed, a 3.75 mm x 13 mm I5 (AB Dental USA) conical groovy implant (Figure 6) was placed in the osteotomy using the enclosed Clip Carrier (AB Dental USA) until increased torque was necessary. The ratchet wrench was then connected to the driver adapter and the implant torqued to final depth reaching a torque level of 65 Ncm (Figure 7). A 5 mm healing abutment, included with the implant, was hand-tightened to the implant (Figure 8). A postoperative radiograph was made of the implant and the healing abutment. The implant was evaluated clinically after one week. The patient stated she had no post-operative discomfort or swelling.

When the patient returned 3-months later, the healing abutment was removed and a SmartPeg™ (Oststell®) was attached to the implant to confirm osseointegration. Using the hand-held probe of the Oststell ISQ® unit, the SmartPeg was stimulated magnetically, without actually being connected to it—or even touching it. Positioning it from buccal to lingual and mesial to distal, readings of 82/84 were recorded on the unit. An ISQ (Implant Stability Quotient) is a measurement scale for use with the RFA (Resonance Frequency Analysis) method of determining implant stability. It’s a mapping of resonance frequencies (kHz), presented as a clinically useful scale of 1-100 ISQ. The higher the ISQ value, the more stable the implant.

Utilizing a Clip Impression Transfer (AB Dental USA), an impression was taken of the implant with no affixing screw (Figure 9). Suitable for closed tray method, there is no need to remove it or to insert the transfer as it remains in the impression throughout the process. A heavy and light bodied polyvinyl siloxane impression material (Take One Advanced™, Kerr) was used in a full-arch impression tray. Once the impression material was set, it was removed from the mouth, picking-up the Clip Impression Transfer) and sent to the lab for custom abutment and crown fabrication (Figure 10).

When the patient returned for the seating appointment, the Inclusive® (Glidewell) titanium abutment (Figure 11) with corresponding BruxZir® (Glidewell Dental Lab) crown was placed, and another x-ray was taken to verify an accurate fit. Since there were no open margins, and the contacts and occlusion were good, the crown restoration was seated using Maxcem Elite™ (Kerr) cement (Figure 12). Once the cement reached its gel stage, it was quickly cleaned off and any excess removed.

The patient was very pleased with the end result and was pleased to have all the services (extraction, grafting, dental implant, abutment and restoration) at one location. Today, patients like to get all their services under one roof. They know, trust, and feel comfortable with their dental provider and usually prefer him/her to perform all their dental procedures necessary to reach optimum dental health.

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