Optimizing anterior esthetics with immediate implant and provisional restoration
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Abstract
The preservation of the hard and soft tissue complex in the esthetic zone following the loss of one or more teeth presents an intimidating and highly visible restorative challenge. Collapse of the hard and soft tissues following tooth extraction is frequently associated with significant resorption, remodeling, and deformity. This case report describes a surgical technique for the preservation of anterior esthetics combining minimally invasive or flapless extraction with immediate implant placement.

Keywords: Implant; Restoration; immediate implant

Introduction
Today the demand for optimal esthetics is coupled with the desire for faster, easier techniques that minimize chair time. Seating a provisional restoration at the time of surgical implant placement benefits both the clinician and the patient by eliminating a second surgical procedure and immediately providing a secure and esthetic restoration. (1) This case report describes a surgical technique for the preservation of anterior esthetics combining minimally invasive or flapless extraction with immediate implant placement.

Case Report
A 25-year-old male patient was referred to the Department of Periodontics, SGT Dental College, Gurugram, with fractured and discolored tooth. Clinical and radiographic evaluation revealed that the discolored right maxillary central incisor exhibited external root resorption and Class I mobility. Radiographic assessment revealed that 21 had root canal filling along with root resorption (Figure 1a, 2a). A treatment plan was developed to extract the tooth and immediately place a dental implant with immediate temporization.

On the day of the procedure, the patient was anesthetized and an atraumatic extraction was performed using periotomes and forceps to elevate the tooth without damaging the surrounding bone (Figure 2b). After thorough curettage of the socket to verify the presence of bone and removal of any soft tissue remnants, a 2-mm pilot drill was used to redirect the axis of the implant into the mid alveolus. An IOPA was taken to verify direction. The site was then enlarged to a 5-mm diameter using the DFI Alpha bio® implant drilling protocol. Then an implant was placed (Figure 1b, 2c). Initial stability was verified with a manual torque wrench to verify 35 Ncm of resistance and an Immediate Temporary Abutment were placed (Figure 2d). After implant placement re-evaluation of socket was done. On evaluation jumping distance was noted to be more than 2mm. To cover this jumping distance PRF membrane with xenograft was placed in socket. A full contoured temporary restoration was fabricated. Care was taken to eliminate all centric and excursive contacts. The temporary restoration was cemented with TempBond™ temporary cement and the patient was instructed not to eat directly on this area for at least 8 weeks.

Postoperative medications included appropriate analgesics and oral antibiotics. The patient was also instructed to apply chlorhexidine rinse topically to the area throughout the healing period. After 12 weeks of healing time, the temporary crown was removed and a stable implant biologic width was noted. An implant level impression was taken and sent to the laboratory for fabrication of a custom zirconium abutment, a corresponding Nobel Procera Zirconia crown, at the time of delivery, the temporary restorations were removed and the final abutment was placed on the implant. A radiograph was taken to verify proper seating of the custom abutment and the Nobel Procera Zirconia crown was checked for fit.

Figure 1a Preoperative, 1b Implant placed, 1c. With permanent restoration

Figure 2a Preop, 2b.socket, 2c Implant, 2d. Provisional prosthesis
contacts and occlusion (Figure 1c). After adjustments, the abutment was torqued to 35 Ncm and the final crown was cemented with provisional cement. The Nobel Procera Alumina veneer was bonded to the tooth using bonding cement.

**Discussion**

It has been clearly established that immediate implant placement cannot prevent dimensional changes of the alveolar ridge following tooth extraction. However, dimensional changes may be predicted on the basis of the defect size and configuration resulting from tooth extraction. Bone healing in extraction socket is dependent on stabilization of the initially formed coagulum in this space. The distance from the bone to the implant is believed to be as the critical factor for the stabilization of coagulum. This observation indicates that large buccal gaps present following immediate implant installation will not predictably be completely resolved without use of grafting materials.

Early publications and clinical experience seem to indicate that PRF improves early wound closure, maturation of bone grafts, and the final esthetic result of the peri-implant and periodontal soft tissues. It also provides a significant postoperative protection of the surgical site and seems to accelerate the integration and remodeling of the grafted biomaterial. Practitioners are often faced with the dilemma of restoring patients as quickly as possible. However, it often takes time to provide optimal treatment. By incorporating new techniques and materials, we as practitioners are able to treat our patients with the most optimal treatment without making sacrifices due to the length of time it has previously taken to accomplish this treatment. By using immediate placement and immediate function we can bring our patients through treatment in a stable, natural manner while better supporting the biological complex. The final restoration can take advantage of newer biologically compatible materials and provide a longer-lasting, more esthetic end result.

In conclusion, when considering the immediate installation of implants into the extraction socket, clinicians should consider the thickness of the buccal bony walls in the extraction sites and the vertical as well as the horizontal positioning of the implants into the sockets, along with material used to bridge the gap between implant and bony wall, as these factors will influence hard tissue changes during healing.

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Source of Support: Nil, Conflict of Interest: None Declared