Clinical Realities

Fabrication of a Provisional Restoration Using a Translucent Matrix and Composite Resin for Immediate Tooth Replacement

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The immediate provisionalization of a single implant in the aesthetic zone is an important step in achieving an optimal final result. This requires a great deal of care and attention, as the contours of the provisional restoration help to develop and maintain the gingival architecture prior to the placement of the definitive restoration.

Careful planning and considerations during the fabrication of an implant provisional restoration include: selecting a proper shade, replicating the surface texture of the contralateral tooth, developing interproximal contact areas that support the papillae, and proper facial cervical contours that ensure a passive relationship between the gingiva and the restoration. The ideal tooth contours are first established in the form of a diagnostic wax pattern, which is subsequently transferred to an acrylic/composite resin provisional restoration. Besides its color stability, composite resin is preferably utilized because it also allows the clinician to shade match and add characterization to enhance the aesthetic result of the provisional restoration. The direct application of composite resin to create aesthetic facial dental contours is, however, technique sensitive and time consuming. With the advent of a translucent silicone matrix, the aesthetic application of composite resin is significantly simplified, as the resin can be completely photopolymerized through the matrix while maintaining the contours of the diagnostic wax pattern.

Case Presentation

A 29-year-old male patient presented with a missing right maxillary central incisor two days following trauma and emergency treatment. As part of the emergency treatment, tooth #8(11) was extracted, particulate bone graft material was placed into the extraction socket, and an interim removable prosthesis was placed. Upon initial review, the patient exhibited asymmetry between the gingival margins of the two maxillary central incisors. Due to the proximal overcontouring of the denture tooth, the papillae were compressed and thereby compromised. The proposed treatment plan entailed removal of the existing bone graft material in the extraction socket, immediate implant placement and provisionalization, and placement of xenograft material into the implant-socket gap.

Figure 1A. Preoperative view with the interim prosthesis replacing tooth #8. Note the overcontouring of the denture tooth and asymmetrical gingival architecture of teeth #8 and #9(21).

Figure 1B. Postoperative view of the provisional restoration at ten weeks. Note the harmonious gingival architecture developed by a properly contoured provisional restoration.

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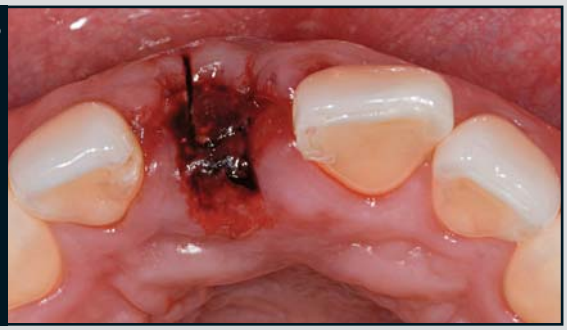
2A

2B



3A

3B

4A

4B

5A

5B

6A

6B

Figures 2A,B,C. Clinical examination revealed an intact labial bony plate and a normal bone-gingiva relationship on the facial aspect (3 mm) of the extraction socket as well as the interproximal aspects (4.5 mm) of the adjacent teeth. Tooth #9 presented with superficial enamel crack lines due to the previous trauma but did not warrant treatment at the time of examination. A polyvinylsiloxane impression was made of the maxillary and mandibular arches. A shade was established using a shade guide, and specific characterizations were noted.

Figures 3A,B,C. A diagnostic wax pattern of tooth #8 was created to emulate the contour and surface texture of the left central incisor. A translucent silicone material (RM Bond, Rocky Mountain Orthodontics, Denver, CO) was expressed over the diagnostic wax pattern and the adjacent teeth to create a full-contour matrix of tooth #8. A second full-contour matrix was fabricated and sectioned in halves along the incisal edges.

Figures 4A,B,C. The diagnostic wax pattern was duplicated with irreversible hydrocolloid and the resulting cast was prepared for the fabrication of the provisional restoration. This translucent matrix was used to fabricate a full-contour provisional restoration out of acrylic resin of the appropriate shade. A cutback of the facial and incisal surfaces of the full-contour acrylic provisional restoration was performed to allow sufficient space for the enamel effects utilizing composite resin. This served as the dentin-colored core of the provisional restoration.

Figures 5A,B,C. After conditioning the dentin core with an adhesive bonding agent, a layer of translucent composite resin was adapted to create an incisolingual wall with the aid of the sectioned matrix. A layer of dentin composite resin was applied to replicate the internal characterization of tooth #9. A layer of enamel composite resin was added to the intaglio surface of the translucent matrix and adapted onto the provisional restoration. After light curing through the translucent silicone matrix, a selective cutback was performed at the incisal third of the provisional restoration and translucent composite resin was added to enhance the aesthetic result.

Figures 6A,B,C. The provisional restoration was then refined with a fine-tapered diamond bur to remove any surface irregularities and sharp edges. The provisional restoration was gently polished with pumice to preserve the facial surface texture. A thin coat of light-curing sealant was applied onto the surface of the provisional restoration. The immediate provisionalization following implant placement proved to be highly aesthetic and would serve as the foundation for the definitive restoration.

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