

Extraction and Immediate Implant Placement Using a Combined Hard and Soft Tissue Augmentation and Provisionalization Technique

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Abstract

Provisionalization of Endosseous implants at the time of placement has become more prominent in the field of dental implantology over the past several years, especially in the esthetic zone. The advantages of this modality of treatment include immediate tooth replacement, containment for bone grafting, soft tissue augmentation, formation and maintenance of esthetic soft tissue contours, minimizing the number of surgical procedures, the treatment time and an improved sense of the patient's perception of the implant treatment process. Although the survival rate for this technique is high and predictable, post treatment gingival recession and bone resorption in the aesthetic zone are potential limitations. This case report presents a surgical technique for the preservation and augmentation of anterior aesthetics that combines minimally invasive extraction, im-

mediate implant placement, a combined soft and hard tissue augmentation and immediate non-functional loading and the use of an implant system that allows platform switching to preserve the buccal bone.

Case Presentation

A 49-year old non-smoking female patient in good health with no contraindications to treatment presented with questionable maxillary right and left central incisors 15 years following traumatic injury that resulted in root canal therapy post and crown. Several apicoectomy surgeries were performed scarring from surgery was evident. Both incisors had mobility range of 2 to 3 (Fig. 1).

Clinical and radiographic examinations revealed no signs of infection and there were root fractures on both teeth, and they were given a hopeless prognosis.



Fig. 1



Fig. 2

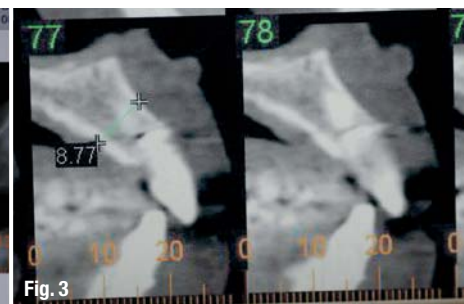


Fig. 3

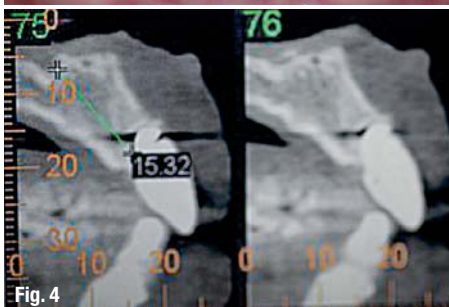


Fig. 4



Fig. 5

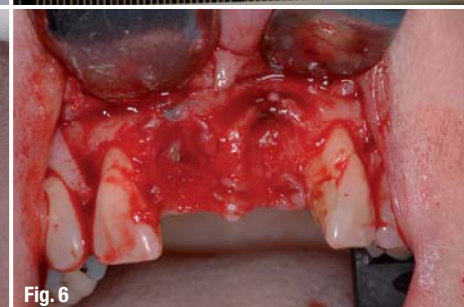


Fig. 6

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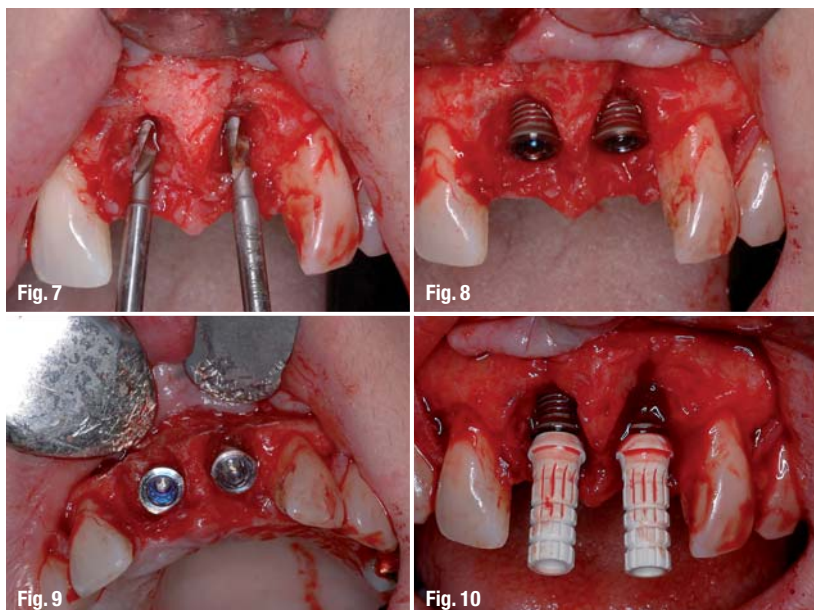
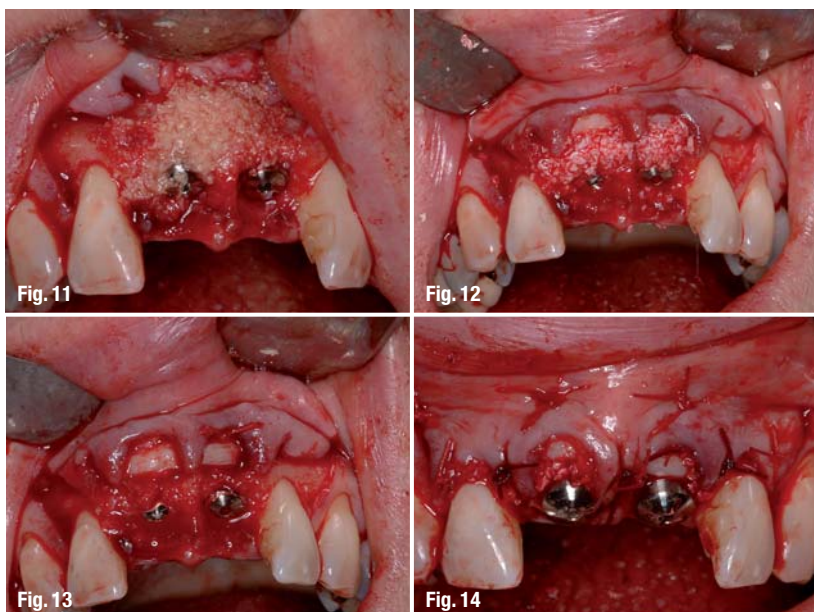


Fig. 1_ Preoperative appearance of right and left maxillary central incisors. **Fig. 2_** Preoperative Cone Beam CT-SCAN. **Fig. 3_** 8.77 mm the width of the alveolar bone in the region of the maxillary right incisor. **Fig. 4_** 15.32 mm the height of the alveolar bone in the region of the maxillary left incisor. **Fig. 5_** Flapless extraction. **Fig. 6_** Flap reflection to determine the interproximal bone height. **Fig. 7_** Twist drills were used as guides. **Fig. 8_** Coronal-apical position of the fixtures. **Fig. 9_** Buccal-palatal position of the fixtures. **Fig. 10_** Temporary cylinders. **Fig. 11_** Mineralized freeze-dried bone. **Fig. 12_** Xenograft bovine bone as a second layer. **Fig. 13_** A connective tissue graft sutured. **Fig. 14_** Flap sutured around the healing abutments.

Pretreatment Planning

The implant team conducted a complete medical and dental evaluation. Diagnostic casts were obtained. Evaluation of the surgical site involved a diagnostic wax-up of the hard and soft tissue and the laboratory technician converted it to surgical guide/restorative template. In addition to the periapical radiographs, a cone beam CT-SCAN was obtained to determine the amount of alveolar bone present apical to the root tips of the maxillary incisors (Fig. 2, 3, 4). Treatment options were given and informed consent was signed.



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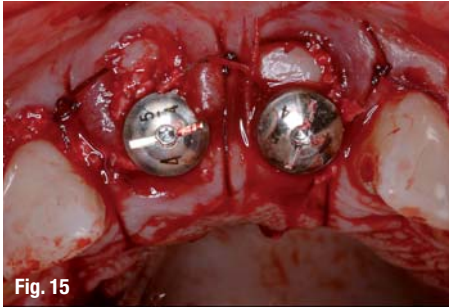


Fig. 15_ Buccal palatal view of flap.

Fig. 16_ Provisional crowns out of occlusion.

Fig. 17_ Ten days post surgery.

Fig. 18_ The second temporary crowns.

Fig. 19_ The final restorations two years post placement.

Fig. 20_ Final radiograph two years post placement.

Fig. 21_ The final restorations.

Surgical Phase

Following the administration of intra-venous sedation (Midazolam 8 mg, Fentanyl 100 microgram, and 8 mg of Dexamethasone) the local anesthetic was administered (lidocaine with epinephrine 1:100,000), atraumatic teeth extractions with periostomes was performed without flap reflection to preserve the interproximal papillae and the buccal plate of bone (Fig. 5). A full thickness flap was reflected (Fig. 6).

The sockets were debrided using hand and rotary instruments. Using copious irrigation, preparation of the osteotomies began using a 2mm twist drill (Fig. 7).

Preparation of the osteotomies continued with a 3 mm drills and the implants were placed according to the manufacture's protocol (4/5/4 x13 mm, Certain Prevail, Biomet 3i, Palm Beach, Florida). The implants were 3 mm below the adjacent teeth CEJ (Fig. 8). The buccal-lingual position was more in a palatal position (Fig. 9).

Provisionalization

Certain Non-hexed PreFormance temporary cylinders were used (Fig. 10). These abutments fulfilled the requirements for platform switching.

Bone and Soft Tissue Grafting

A combination of mineralized freeze dried bone allograft (MFDBA) and xenograft bovine bone were used (Fig. 11). A subepithelial connective tissue graft was harvested from the right palatal area of the first and second bicuspid and was sutured using 4-0Vicryl suture to allow the soft tissue augmentation (Fig. 13). The pedicle flap was coronally advanced and was sutured around the healing abutments while the temporary crowns were finished by the restoring dentist (Fig. 14, 15). The provisional crowns were fab-

ricated in the office laboratory. The healing abutments were removed and the temporary crowns were seated. The occlusion was checked to eliminate any premature contacts (Fig. 16).

The patient was provided with appropriate post operative instructions and returned in 10 days for a follow-up visit (Fig. 17).

Restorative Phase

Twelve weeks post extractions and implants placement and provisionalization, the temporary crowns were changed to different temporary crowns to improve the soft tissue healing (Fig. 18). Six weeks later, the patient was seen by her restorative dentist for the final fixtures level impressions and the fabrication of the final restorations. Prefabricated Gingi-Hue abutments were used with the platform switching concept.

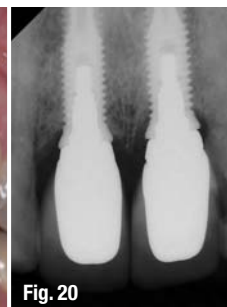
The final porcelain fused to metal crowns were cemented on the abutments using permanent cement. The patient seen for follow-up visits (Fig. 19). The buccal gingival height remained stable two years after the placement of the final restoration. Periapical radiograph were taken after two years and confirmed the stability of the bone level around the implants (Fig. 20).

Conclusion

This case report describes a technique to preserve and augment anterior aesthetics by combining atraumatic teeth extraction, hard and soft tissue augmentation, immediate provisionalization and using the platform switching concept to preserve the buccal plate. The gingival tissue surrounding the implants has remained stable with no recession two years following final crowns placement (Fig. 21).

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