

IMPLANT SITE DEVELOPMENT USING A BOVINE COLLAGEN MEMBRANE AND ALLOGENEIC BONE

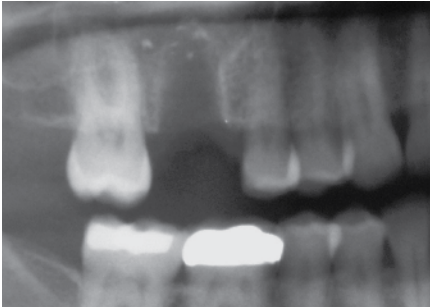


Fig 1a



Fig 1b



Fig 2a



Fig 2b



Fig 3



Fig 4



Fig 5



Fig 6

A 48 year-old female presented for implant replacement of the maxillary right first molar, which had been extracted 6 months previously. There was a substantial hard tissue defect requiring augmentation prior to implant placement (Fig 1a and Fig 1b). The original plan was to augment the site in two stages. First, a particulate graft would be used to expand the soft tissue envelope, and then an autogenous block graft would be placed.

The initial surgical exposure of the healing socket revealed soft tissue extending up to and including the antral floor (Fig 2a). After removal of the soft tissue, the antral membrane was found to be intact, as well as the palatal wall and the mesial and distal bony walls. The buccal plate and floor of the socket were missing (Fig 2b).

Allogeneic bone putty (Regenaform® Moldable Allograft Paste, Exactech Dental Biologics) was mixed according to the manufacturer's directions, placed into the defect, and shaped to restore the contour of the ridge (Fig 3).

A bovine collagen guided tissue regeneration membrane (Cytoplast® RTM Collagen) was trimmed to fit over the graft (Fig 4 and Fig 5). Primary closure was achieved over the membrane and graft using 3-0 PTFE sutures (Cytoplast® PTFE Suture; CS0518) (Fig 6).



Fig 7



Fig 8



Fig 9



Fig 10

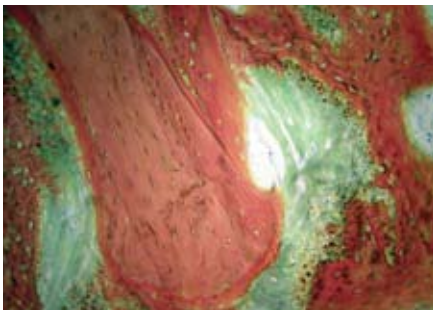


Fig 11



Fig 12



Fig 13



Fig 14

After 6 months of healing, there was excellent healing with minimal loss of graft volume (Fig 7). Surgical exposure (Fig 8) revealed good bone density, and a 4.7 x 11.5 mm tapered endosseous implant was placed (Fig 9).

A bone core, harvested with a trephine drill from the implant site (Fig 10) and examined microscopically, revealed 42% vital bone (Fig 11), with active remodeling and active new bone formation evident in association with both the demineralized and mineralized components of the graft (Histology by Michael D. Rohrer, DDS, MS. University of Minnesota Hard Tissue Research Laboratory).

Four months after placement, the abutment was placed and the implant was successfully restored (Fig 12 and Fig 13). After 16 weeks in function in a provisional restoration, the periapical radiograph demonstrates good bone density in the grafted area (Fig 14).

SUMMARY

This case demonstrates the successful reconstruction of a large, 3-walled defect in the maxilla, including loss of the antral floor. The use of a cross-linked, type 1 bovine collagen membrane in conjunction with mineralized and demineralized allograft putty resulted in regeneration of vital bone of sufficient volume and density to accommodate a wide diameter implant. This was accomplished in a single surgical procedure, eliminating the need for autogenous block grafting. Histological analysis revealed vital bone with remodeling of the allograft particles and continued bone formation at 6 months.

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