OSTEOGENICS
CLINICAL EDUCATION

A DUAL-LAYER MEMBRANE TECHNIQUE FOR IMMEDIATE IMPLANT PLACEMENT IN THE ESTHETIC ZONE

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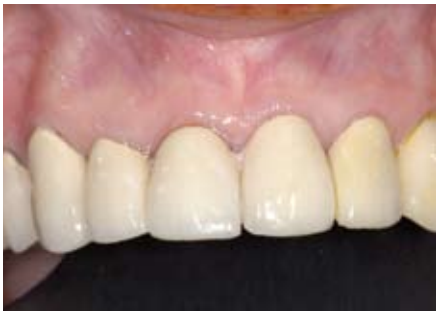

Fig 1a

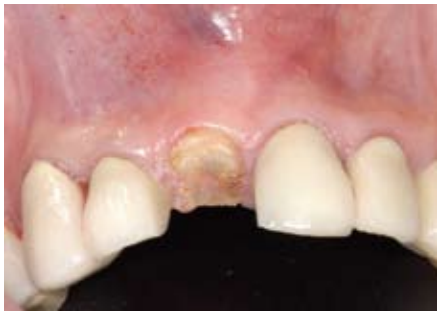

Fig 1b

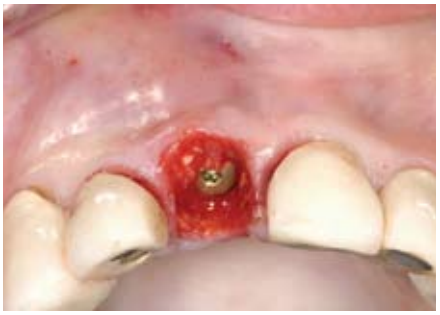

Fig 2

Fig 3

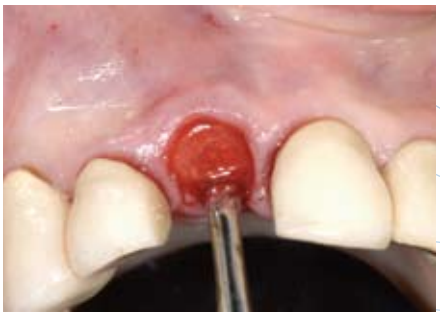

Fig 4

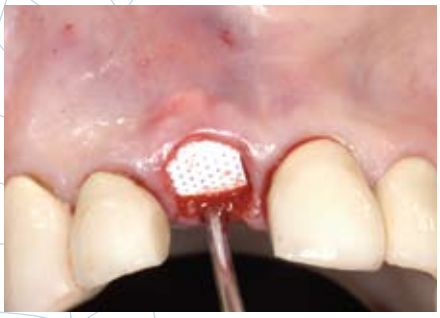

Fig 5

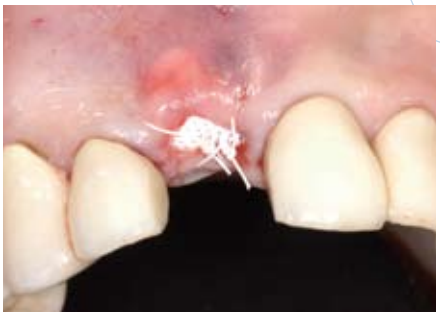

Fig 6

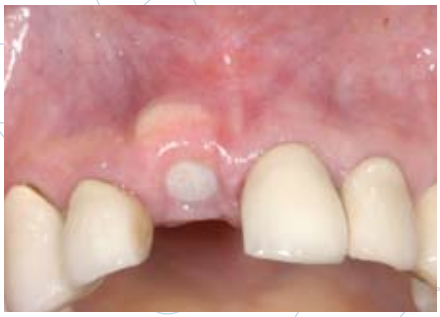

Fig 7

This is a 60 year-old female who presented with a crown-root fracture of the maxillary right central incisor. The crown was retained with denture adhesive (Fig 1a and b). A thin gingival biotype and multiple, adjacent porcelain fused to metal restorations increased the esthetic risk in this case. To minimize soft and hard tissue recession, a minimally invasive extraction technique and immediate implant placement combined with guided tissue regeneration was planned.

The tooth root was extracted using only an intrasulcular incision and elevation with a micro periosteal elevator. Following curettage of the socket, an implant was placed towards the palatal wall of the socket. A thin buccal plate was noted. The gap between the implant and the buccal wall of the socket (2.5 mm) was grafted with demineralized allograft bone and beta tricalcium phosphate (Cerasorb®, Riemser Arzneimittel AG) (Fig 2).

To thicken the soft tissue while maintaining the natural position of the mucogingival junction, a dual layer GTR technique was used, employing a cross-linked type 1 bovine collagen membrane covered with a high-density PTFE (dPTFE) barrier membrane (Fig 3).

To stabilize the barrier membranes, a subperiosteal pocket was developed on the facial and palatal aspect of the socket. Next, the bovine collagen membrane (Cytoplast® RTM Collagen) was placed to extend approximately 5 mm beyond the socket margins (Fig 4). To protect the collagen membrane and further stabilize the site, a textured dPTFE membrane (Cytoplast® TXT-200) was placed over the collagen (Fig 5).

Closure was achieved with a criss-cross 3-0 PTFE suture (Cytoplast® PTFE Suture) (Fig 6). Note that primary closure was not required due to the presence of the dense PTFE membrane and its ability to remain exposed without epithelial or bacterial penetration. The suture was removed at 2 weeks, and the soft tissue overlying the exposed membrane demonstrated healing without signs of inflammation.

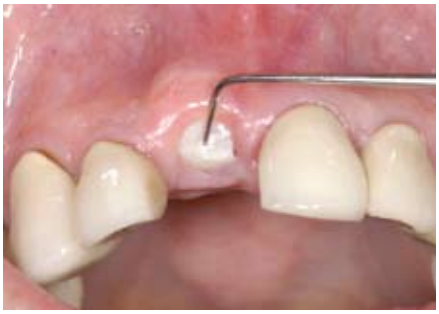

Fig 8a

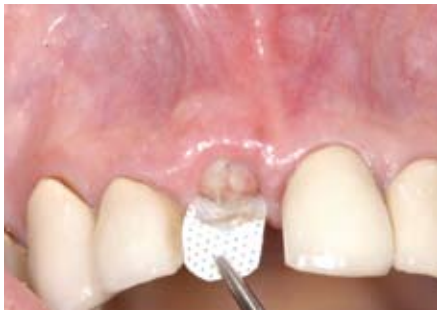

Fig 8b

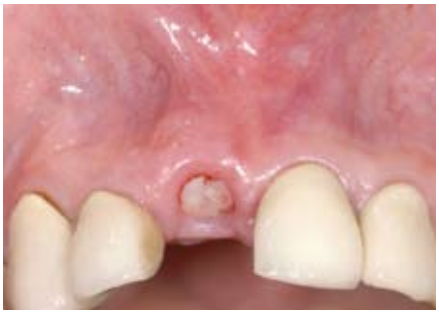

Fig 9

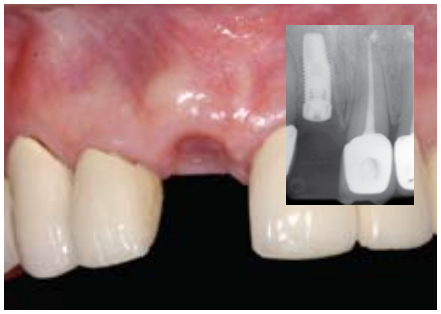

Fig 10

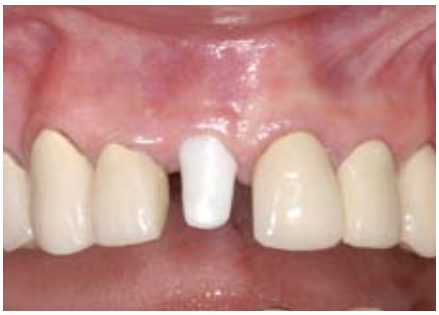

Fig 11

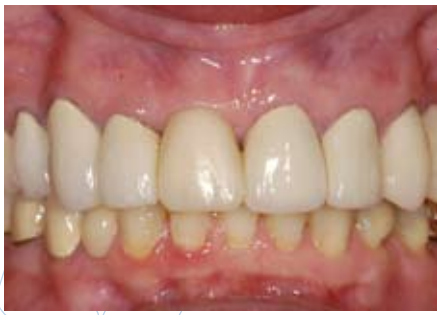

Fig 12

After 4 weeks, the dPTFE membrane was removed non-surgically with topical anesthesia. (Fig 8a and 8b). Immediately following removal of the dense PTFE barrier, the collagen membrane is observed intact and with a developing blood supply (Fig 9).

After four months of healing, the soft tissue is stable with full interproximal papillae (Fig 10) and preservation of the natural mucogingival architecture. To aid in development of soft tissue contours, a removable temporary partial denture was used with an ovate pontic. Radiograpically, there is good bone density adjacent to the implant and maintenance of the interdental crest.

The restorative phase included placement of a custom Procera zirconia abutment (Fig 11) and a processed acrylic restoration. After 12 weeks of provisional loading, the soft tissues were stable, with preservation of anatomical contours.

Summary

This case demonstrates the use of a dual-layer technique for immediate placement of implants into extraction sockets. While bone formation and successful integration will occur with a gap as wide as 2.0 mm, as much as 56% of the buccal-palatal width is lost during the early healing phase.[1] This loss of tissue thickness can result in apical migration of the gingival margin, loss of the interdental papilla and discoloration of the soft tissues due to show-through of the underlying dental implant. This technique, using the principles of guided tissue regeneration combined with augmentation of the gap, results in preservation of the natural contours, even in high-risk sites.

1. Botticelli D, Berglundh T, Lindhe J. Hard-tissue alterations following immediate implant placement in extraction sites. J Clin Periodontol 2004 Oct;31(10):820-8.

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