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# Exposure of a dense PTFE Membrane in a GBR Procedure: Proposal of a Treatment Protocol

Italian Society of Osseointegration

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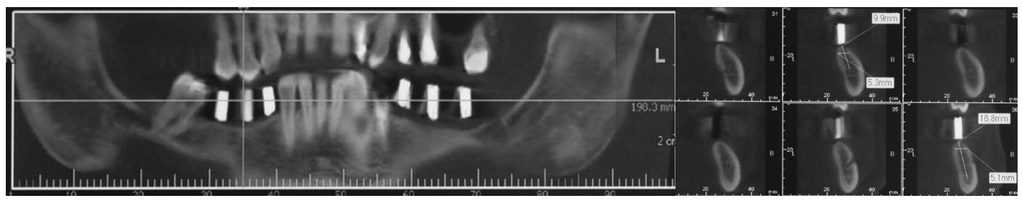
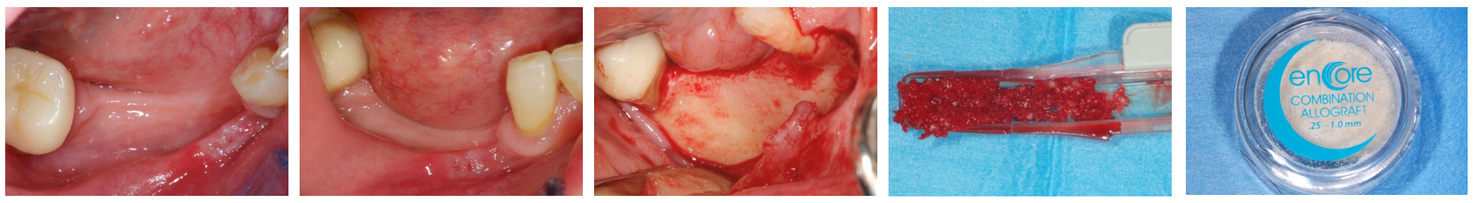
SOCIETA' ITALIANA DI IMPLANTOLOGIA OSTEOINTEGRATA

Objectives: Exposure of polytetrafluoroethylene (PTFE) membranes has always been considered to be the major problem that can negatively affect the result of the guided bone regeneration (GBR), causing the infection of the regenerated site. Dense polytetrafluoroethylene (d-PTFE) membranes allow to solve this problem, since the dimension of the their pores doesn't allow the bacteria penetration, until the extension of the exposure doesn't reach the margins of the membrane. A case report describes a protocol to treat the membrane exposure.

Case presentation: A staged approach GBR procedure was performed for the correction of a mandibular horizontal ridge deficiency in the premolars and first molar region. A tenting screw helped the titanium reinforced d-PTFE membrane (Cytoplast TI 250 PL, Osteogenics Biomedical, Lubbock, TX, USA) not to collapse over a graft composed by autogenous cortical bone, collected locally with a disposable bone collector (Safescraper, Meta, Reggio Emilia, Italy) mixed to an allograft composed by 70% mineralized bone and 30% demineralized bone (Encore™, Osteogenics Biomedical, Lubbock, TX, USA), in a 1:1 ratio. PTFE sutures were removed 2 weeks later, and after 3 more weeks the membrane exposure happened. The margins of the membrane were completely covered by the flap and no sign of infection was present. The patient was instructed to clean softly and to rinse with 0.2 chlorexidine every 8 hours. The patient was controlled every week, the membrane exposure became larger at every follow-up but, since its margins were completely covered by the mucosa, it was not removed until the 10th post-operative week, when the extension of the exposure was considered dangerous. After membrane removal, the regenerated area appeared to be covered by a thin layer of connective tissue. No sign of infection was detected. The graft was covered by a cross-linked collagen membrane (Cytoplast RTM 2030, Osteogenics Biomedical, Lubbock, TX, USA) stabilized with titanium tacks and by a collagen fleece (Medicipio®, Medichema GmbH, Chemnitz, Germany). No attempt of coronal flap advancement was done, but sutures just stabilized the collagen fleece that guided the mucosal repair.

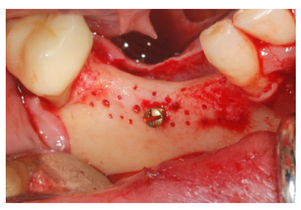


CBCT scans show an horizontal ridge deficiency.

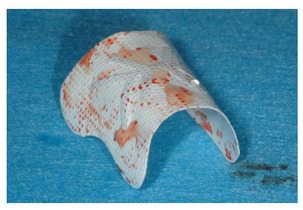


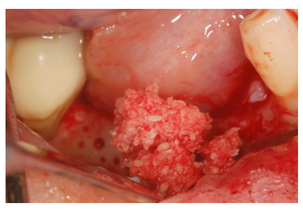

A triangular mucoperiosteal flap was raised and an autogenous cortical graft was harvested locally with Safescraper device.

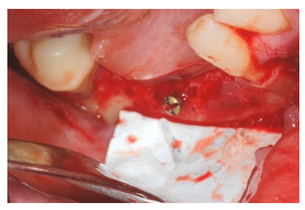
1,5 cc of Encore combination allograft was mixed with the autogenous bone collected.



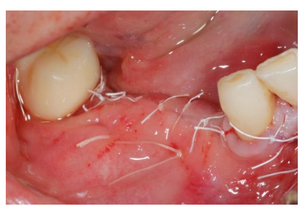
A Pro-Fix tenting screw helped to sustain a Cytoplast Ti-250 PL d-PTFE membrane, that was trimmed and shaped to fit precisely over the defect.



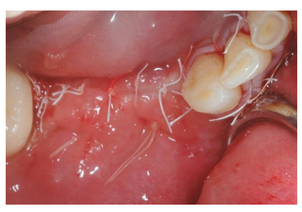


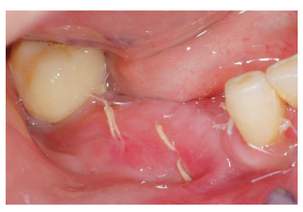


The graft was covered by the membrane, that was stabilized with Pro-Fix micro screws.

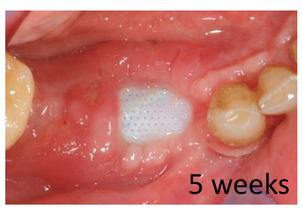


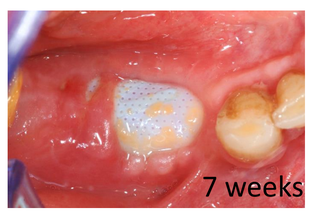
Horizontal mattress and single PTFE sutures.

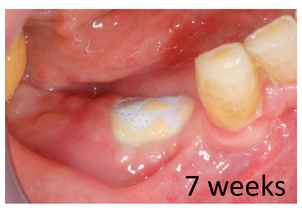


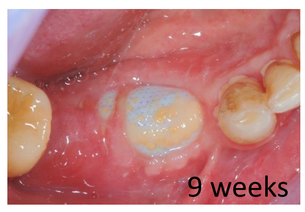


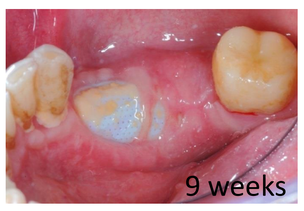
Suture removal after 2 weeks.



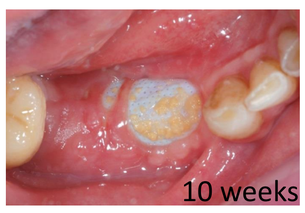



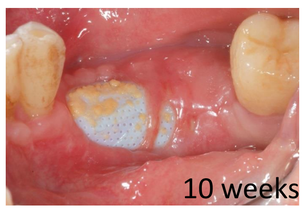



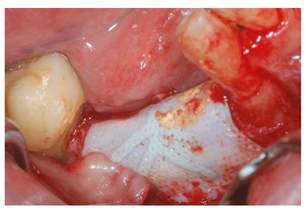



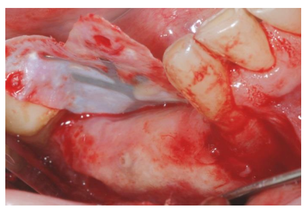

Some weeks after suture removal, the membrane exposure happened. It was not removed until the mesio-distal limits of the exposure were far from the edges of the membrane.

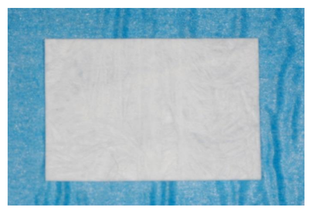


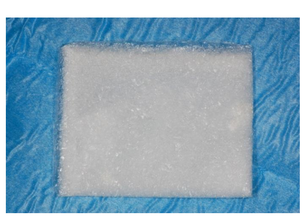

After 10 weeks the membrane was removed. The graft underneath the membrane was covered by a thin connective tissue layer. No sign of infection or suppuration was detected.

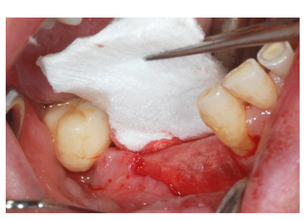


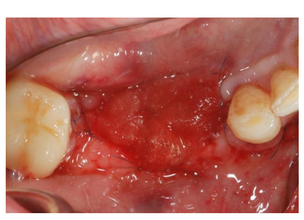


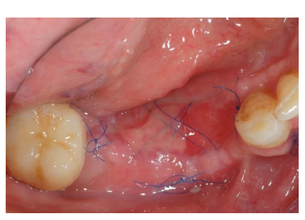


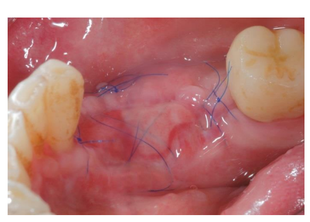
A Cytoplast RTM 2030 collagen membrane, stabilized with tacks, covered the immature graft.

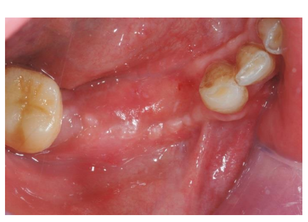


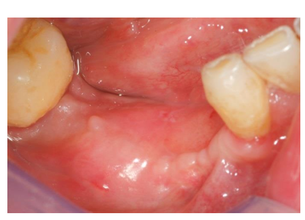


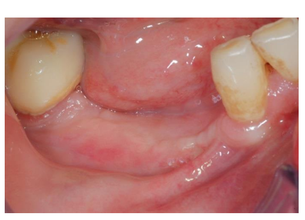






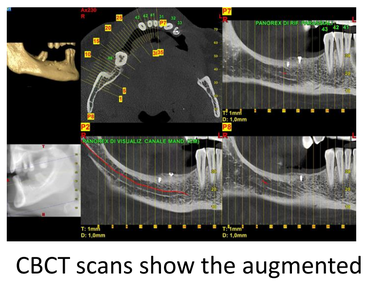




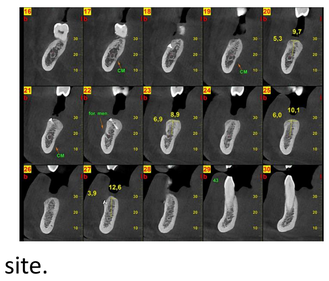


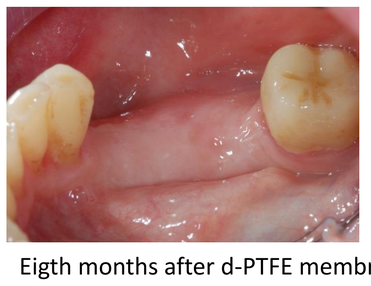
A Medicipio C Collagen Fleece was applied over the collagen membrane to help the soft tissue to close the dehiscence for secondary intention. No attempt of coronal flap movement was done. Keratinized tissue filled the gap.

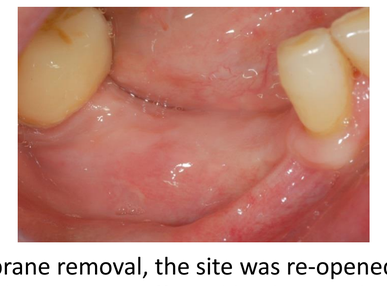
Results: Eight months after d-PTFE membrane removal the site was re-opened The bulk of regenerated bone, as shown by the post-operative computed tomography allowed the insertion of 2 Laser Lok Tapered implants (BioHorizons, Birmingham, AL, USA) in the region of the first premolar and the first molar. A biopsy of the regenerated area was taken in a bucco-lingual direction in the area between the 2 implants. Histologic examination revealed new bone formation, almost totally lamellar mature bone, in direct contact with the graft remnants. No sign of inflammation was observed.

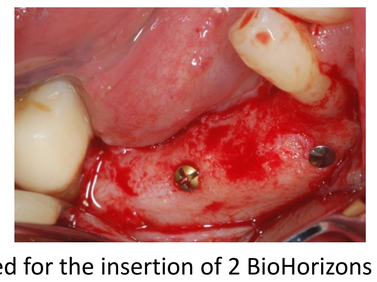


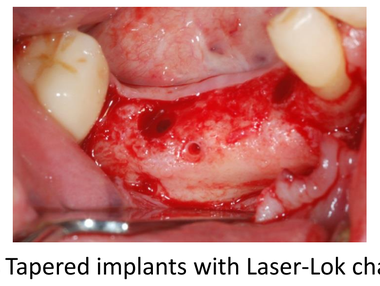
CBCT scans show the augmented site.



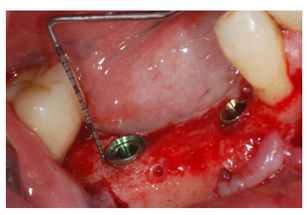


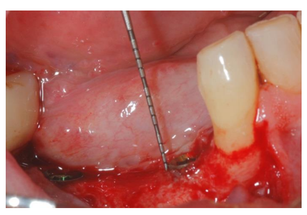






Eigth months after d-PTFE membrane removal, the site was re-opened for the insertion of 2 BioHorizons Tapered implants with Laser-Lok channels treatment at the neck. The augmemntation procedure was not affected by the membrane exposure.

















The neck of the implants with Laser-Lok channels were positioned above the bone crest for connective tissue integration. The width of keratinized tissue allowed healing abutment application for unsubmerged healing. After a 3-month healing period, provisional abutment and provisional restoration were connected for progressive loading.


















A trephine bur was used with a bucco-lingual direction to harvest a little specimen of the regenerated area between the implants. The sections were stained with hematoxilin and eosin. CT: Connective Tissue, NB: New Bone, G: Graft

Conclusion: In case of membrane exposure, d-PTFE membrane could be safely left in site until its margins remained covered by the flap. Its substitution, after 10 weeks, with a collagen membrane and a collagen fleece, allowed a complete bone regeneration underneath the membrane and the mucosal repair, with the formation of keratinized tissue without any coronal flap advancement.