Dental Surgery

Clinical Sheet

PERI-IMPLANT REGENERATION FOLLOWING PERI-IMPLANTITIS

Use of equine origin bone substitutes and pericardium membrane to restore peri-implant volumes.

Dr. Giacomo Tarquini
Private practitioner
Rome, Italy
g_tarquini@libero.it

Peri-implantitis refers to an inflammation of the peri-implant tissues associated to progressive resorption of the crestal bone that may lead to implant loss. The main etiological factor of peri-implantitis lies in the accumulation around the implant of a biofilm formed by bacterial species often common to those that cause periodontitis. In addition to individual predisposition, other factors that promote the onset of the disease include incorrect three-dimensional placement of the implant, failure of the bone reconstruction procedures leading to exposure of the titanium surface, an inconsistent prosthetic rehabilitation, the presence of cement residues in the peri-implant sulcus, as well as the patient's habits, such as poor oral hygiene or smoking. Some therapeutic protocols for dealing with minor or moderate bone resorption entail elimination of the peri-implant bacterial infection through implant decontamination by using antibiotics and/or other chemical-physical methods. However, eliminating the infection, hence the inflammation, does not result in peri-implant bone tissue regeneration. The residual bone defect represents a factor promoting the onset of a new infection as well as a condition that prevents correctly restoring the mucogingival profiles, leading to a residual aesthetic defect, which is especially undesirable if the implant has been placed in an aesthetic area. That is why it is recommended to make use of guided bone regeneration techniques that allow the correct peri-implant bone volumes to be restored, using a membrane assuring a barrier effect for a suitable time for regeneration.

Materials

The peri-implant regeneration surgery entailed using a bone graft in granules (Bioteck) and Heart pericardium membrane (Bioteck), both of equine origin. The bone graft consisted of cortical and cancellous granules (1:1) sized 0.5 – 1 mm. The small granule size was selected because it makes it easier to place them around the implant.
Bioteck bone grafts are obtained through the Zymo-Teck enzymatic process, which selectively removes equine antigens while preserving the bone collagen, a characteristic that assures effective remodeling and replacement with newly formed bone tissue. Zymo-Teck is also applied to obtain the Heart pericardium membranes: the process is used selectively to leave unaffected the inter-molecular bonds that provide tensile strength and elasticity to the membrane, as well as assuring a significantly longer protection time than conventional collagen membranes.

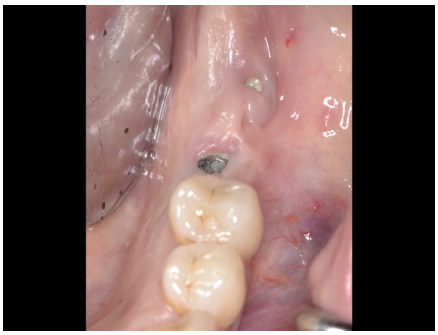

Fig. 1 *– After removal of the prosthetic crowns and components, slight suppuration is observed at the two implants in position 3.6 and 3.7.*

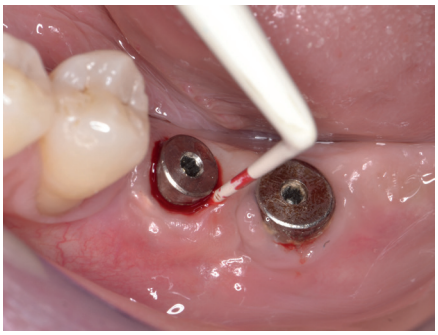

Fig. 2 *– Probing depth is 6-7 mm on the buccal side and 5-8 mm on the lingual side.*

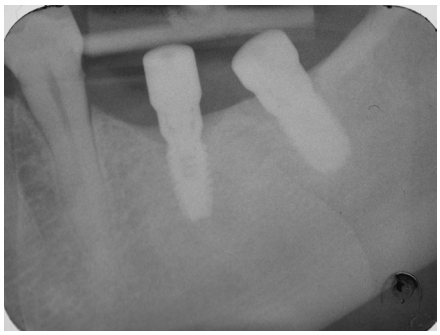

Fig. 3 *– X-ray check prior to the procedure.*

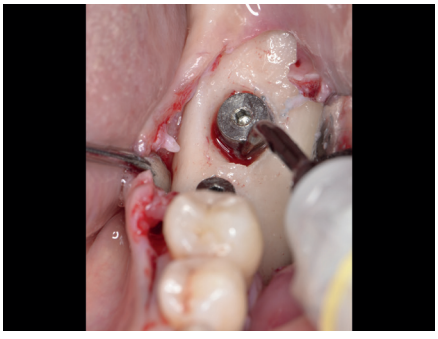

Fig. 4 *– The bone defects are cleaned with piezoelectric instruments.*

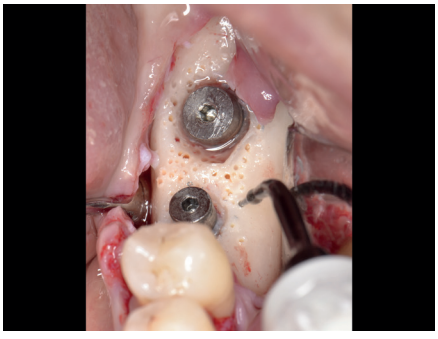

Fig. 5 *– The cortical bone bed is prepared, also with piezoelectric instruments.*

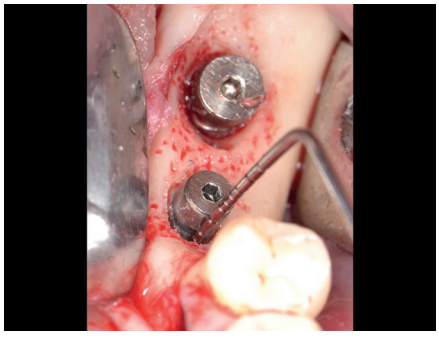

Fig. 6 *– The internal wall of the defect's infra-osseous component, being corticalized, is prepared by using thin piezoelectric inserts.*

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Results

The case concerns a 55-year-old female patient who presented with bleeding and pain when performing oral hygiene at the peri-implant soft tissues in position 3.6 and 3.7. Dental history was negative for periodontitis.

The patient was admitted to a professional oral hygiene schedule to completely solve the inflammatory condition. The implants showed no mobility. However, the intraoral examination revealed bleeding and purulent exudate on probing, and a pocket depth of 6-7 mm on the buccal side and 5-8 mm on the lingual side. The endoral X-ray revealed the presence of two peri-implant resorption cones, which led to the peri-implantitis diagnosis and to drawing up a treatment plan including peri-implant bone regeneration.

After opening a full thickness flap, careful ultrasound debridement was performed on bone defects. The receiving cortical bone was then prepared using a round bur also on the internal wall of the infra-osseous component of the defect, which was corticalized. The lingual and buccal flaps were released according to the technique described by Ronda and Stacchi[1]. Specifically, release of the buccal flap was achieved via the *Brushing Technique*. The implant surface was then decontaminated by applying a sulphonated phenol-based gel locally. The membrane was then placed along the vestibular side and the peri-implant bone defect was grafted with the bone granules. The membrane was then reflected to cover the grafted site, placed also along the buccal side, and finally sutured.

Twelve months after the procedure, the X-ray showed the implant bodies were completely inserted in the regenerated crestal bone. Probing was physiological and less than 4 mm. The patient did not report any spontaneous or evoked symptoms and no soft tissue damage was observed.

1. Ronda M. & Stacchi C. Management of a coronally advanced lingual flap in regenerative osseous surgery: a case series introducing a novel technique. *Int J Periodontics Restorative Dent*, 31(5), 505-513 (2011).

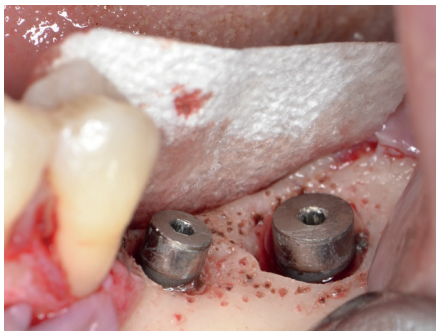

Fig. 7 *– The Pericardium membrane is set underneath the vestibular margin of the gingiva.*

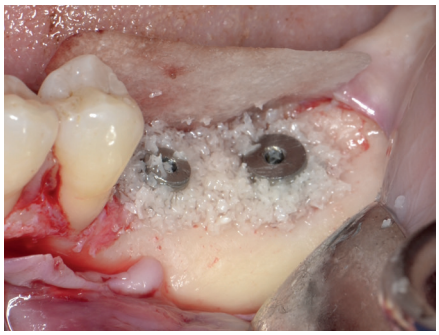

Fig. 8 *– After hydrating with sterile saline, the bone graft is placed so as to restore the entire lost bone volume.*

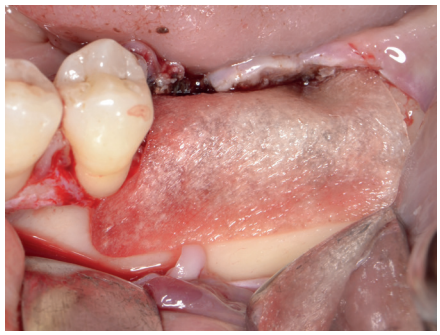

Fig. 9 *– The membrane is reflected to protect the entire grafted site.*

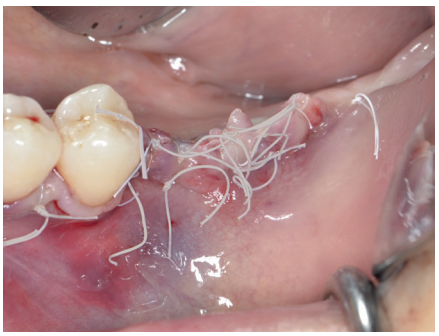

Fig. 10 *– The flap is accurately sutured to assure healing by first intention.*

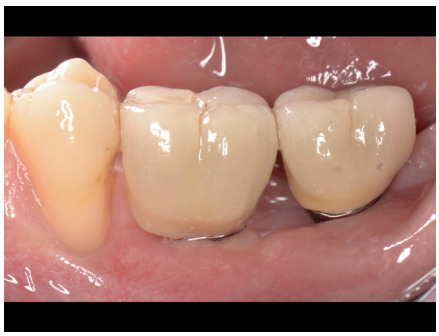

Fig. 11 *– Follow-up at 12 months, clinical appearance of the rehabilitation.*

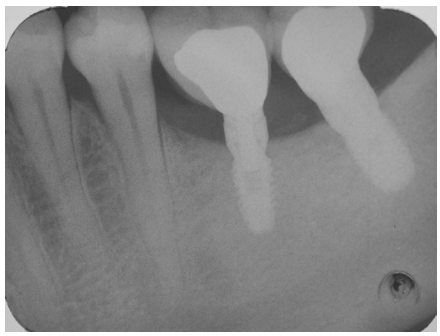

Fig. 12 *– Follow-up at 12 months, peri-implant levels are retained.*

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