Dentistry

Clinical Sheet

PERI-IMPLANT REGENERATION USING A FLEXIBLE CORTICAL BONE SHEET

Flex Cortical Sheet and equine collagen-preserved granules in the treatment of multiple implant dehiscences.

Dr. Enrico Piccolo
Freelancer in Trecase (NA), Italy
www.enricopiccolo.it
Info@enricopiccolo.it
B.E.St. - Bone & Esthetic Stability

Peri-implant dehiscences are bone defects frequently encountered in implantology, particularly at sites characterized by reduced vestibular bone thickness, post-extraction bone resorption or incorrect implant placement. These conditions can compromise adequate bone coverage of the implant and adversely affect its biological and aesthetic stability. In such cases, guided tissue regeneration (GTR) and guided bone regeneration (GBR) procedures are among the most commonly used methods for restoring peri-implant tissues and bone volume.

In these procedures, the key element is the use of membranes to promote proper healing of the treated site. The membranes act as a selective barrier, preventing the proliferation of unwanted cells within the graft site, helping to stabilize the regenerative material and supporting soft tissue regeneration. To be effective, they must meet certain requirements, such as adaptability to the geometry of the defect and providing an adequate period of protection for the regenerative processes at the treated site. Flexible cortical sheets with preserved collagen, once hydrated, meet these requirements. Furthermore, thanks to their ability to be physiologically recognized by osteoblasts and osteoclasts, they undergo progressive resorption and are replaced by new, viable tissue from the patient.

The clinical objective of peri-implant regeneration is to achieve a bone volume that remains stable over time, through the formation of a new cortical bone capable of effectively and durably supporting the peri-implant soft tissues, particularly in areas of high aesthetic importance.

Materials

The implant dehiscence procedure was performed using a 0.5 mm-thick flexible cortical bone sheet (Osteoxenon Flex Cortical Sheet, OSP-0X09, Bioteck S.p.A) and with the support of collagen-preserved cortical-cancellous granules measuring 0.25–1 mm (Osteoxenon Cancellous Cortical Granules, Bioteck S.p.A).

These are biomaterials of equine origin produced using the Zymo-Teck enzymatic deantigenation process (Bioteck S.p.A). This process utilizes enzymes and low temperatures to eliminate all immunogenic components of the tissues while preserving the collagen and mineral component in their native form. Furthermore, the Flex Cortical Sheet undergoes a further treatment of partial demineralization in order to remove part of the mineral component.

Thanks to this additional treatment, the lamina becomes flexible following hydration (with saline solution or autologous derivatives) and can adapt plastically to the graft site while maintaining its shape and thickness.

Fig. 1 *– Initial situation: exposed implant neck on teeth 13 and 15, dehiscence and exposure of the fixture on tooth 14, and signs of inflammation of the peri-implant tissues.*

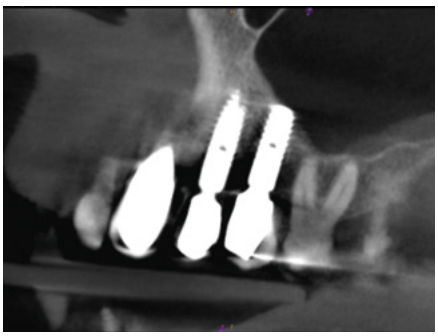

Fig. 2 *– Initial situation: sagittal section of a cone-beam computed tomography (CBCT) scan showing significant bone loss in the inter-implant spaces.*

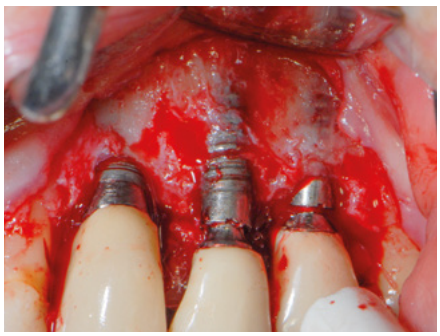

Fig. 3 *– Exposure of the surgical site, showing the coils exposed on the buccal side and the apico-coronal misalignment of the implant.*

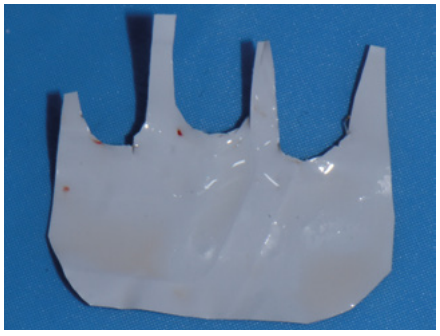

Fig. 4 *– Marking the defect on the surgical template.*

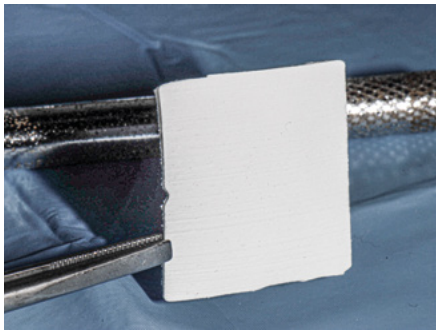

Fig. 5 *– Flex Cortical Sheet before cutting and shaping according to the surgical template..*

Fig. 6 *– Cortico-cancellous granules with preserved collagen, hydrated with saline solution.*

PERI-IMPLANT REGENERATION USING A FLEXIBLE CORTICAL BONE SHEET

Flex Cortical Sheet and equine collagen-preserved granules in the treatment of multiple implant dehiscences.

Results

The case in question concerns a 65-year-old non-smoking female patient who had implants in positions 13–14–15 with exposed threads. The patient's general state of health was good. In the oral cavity, a preliminary phase of professional cleaning and antibiotic prophylaxis was required, aimed at managing inadequately treated carious lesions, incorrect prosthetic restorations and sites of infection.

As the patient refused to have the implants removed, a variable-thickness flap was created, preserving the interdental papillae from positions 16 to 12, which were reflected palatally to allow complete exposure of the site. Following the removal of residual fibrous tissue, chemical and mechanical decontamination of the exposed implant threads was carried out. Subsequently, using a surgical template as a guide to map the morphology of the defect, including the interdental spaces, the Flex Cortical Sheet was contoured.

After hydration for a few seconds with sterile saline solution, the lamina was adapted to the defect, secured at its most apical portion using two titanium pins, and gently inserted into the interdental spaces to be folded over onto the palatal side.

Before folding, the exposed implant threads were covered with preserved collagen granules, which had previously been hydrated with saline solution.

The final step consisted of tucking the terminal portions of the lamina, after insertion into the interdental spaces, beneath the full-thickness palatal flap, thereby eliminating the need for palatal pins.

Two months after the procedure, the implant threads were completely covered and the interdental papillae were preserved. The residual exposure of approximately 2 mm of the abutment neck at position 14, due to its irregular morphology, was subsequently corrected using an autologous palatal connective tissue graft.

Six months after the bone graft, a good increase in both soft and hard tissues could be observed. Indeed, on the second CBCT scan performed 6 months after surgery, a marked improvement in bone tissue within the inter-implant spaces can be observed. The treatment, completed with a zirconia and ceramic bridge, successfully met the patient's requirements for improved aesthetics by covering the exposed implant threads.

Fig. 7 *– The site was covered with a moistened and contoured Flex Cortical Sheet, secured with pins apically and folded into the interdental spaces coronally.*

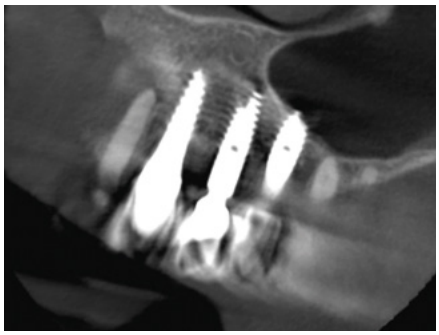

Fig. 8 *– A sagittal-plane CBCT image taken 6 months after surgery, showing, compared with the previous image, new bone formation in the spaces between the implants.*

Fig. 9 *– Tissue healing 6 months after suture removal, with 2 mm of residual exposure of the collar at position 14.*

Fig. 10 *– Thirty weeks after the GBR, a gingival plastic surgery was performed using an autologous palatal connective tissue graft.*

Fig. 11 *– X-ray taken two months after the removal of the sutures from the connective tissue graft, with a zirconia and ceramic bridge in place.*

Visit **www.bioteckacademy.com** for other clinical sheets and to access the ever up-to-date scientific literature.