Dental Surgery

Clinical Sheet

ONLAY GRAFT WITH HARVESTING FROM RAMUS

Horizontal ridge augmentation with bone harvested from ipsilateral ramus.

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Harvesting from intra-oral sites is a preferable treatment option in the case of medium or small-sized alveolar reconstructions, as it is less invasive than extraoral harvesting, to be reserved to major reconstructions.

The ramus is among the most indicated donor sites for the purpose as it is associated to lower morbidity than other harvesting sites.[1] Bone harvested from this site is mainly cortical, featuring a good density and low resorption rate.

Advantages for the patient compared to harvesting from other intra-oral sites, and specifically compared to the menton symphysis, include lower functional and aesthetic discomfort due to the low incidence of neuro-sensorial alterations in the harvesting area and low effect of this access to the face contour.[2]

1. Capelli M., et al. Autogenous bone graft from the mandibular ramus: a technique for bone augmentation. Int. J. Periodonticsc Restorative Dent.23,277-285(2003).

2. Misch CM., et al. Ridge augmentation using mandibular ramus bone grafts for the placement of dental implants: presentation of a t Materials echnique. Pract. Periodontics Aesthetic Dent. 8,127–135 (1996).

Materials

At the end of the reconstruction procedure, the graftd site was covered with the Heart pericardium membrane (HRT-002, Bioteck, Italy).

The Heart membrane is obtained from equine pericardium through an exclusive, patented process that preserves its collagen content in native structure as well as the three-dimensional texture.

This provides high mechanical resistance, long resorption time and good handling, which are useful features especially when covering extensive defects. It easily adapts to anatomical profiles and does not require fixing with screws or nails.

After grafting it undergoes slow degradation, until it is fully resorbed.

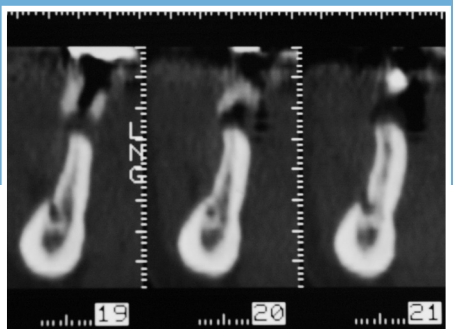

Fig. 1 *– Pre-operative CT scan of the atrophic ridge in transverse section.*

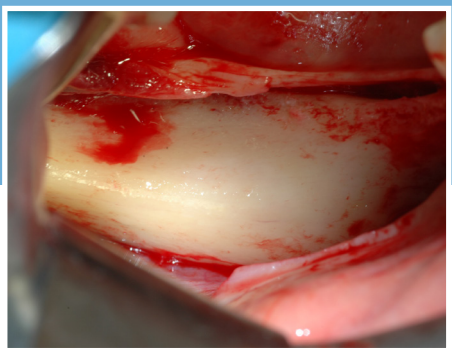

Fig. 2 *– Detachment of the mucoperiosteal flap and exposure of the mandibular ramus.*

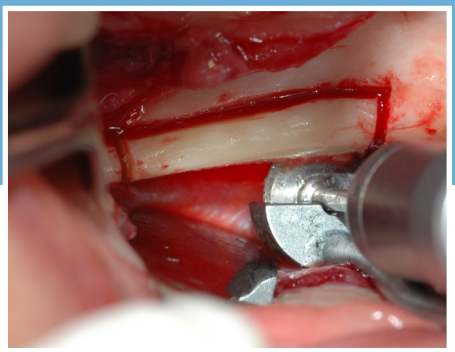

Fig. 3 *– An osteotomy step performed with a rotating instrument.*

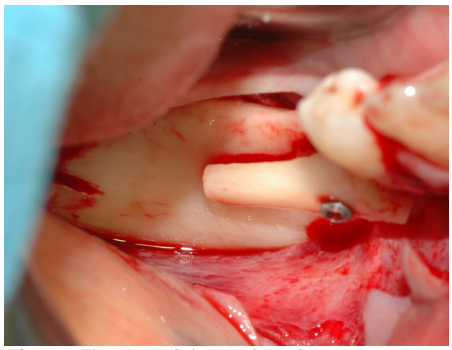

Fig. 4 *– Fixation of the graft with an osteosynthesis screw. Notice how the back of the graft is not in contact with the recipient site.*

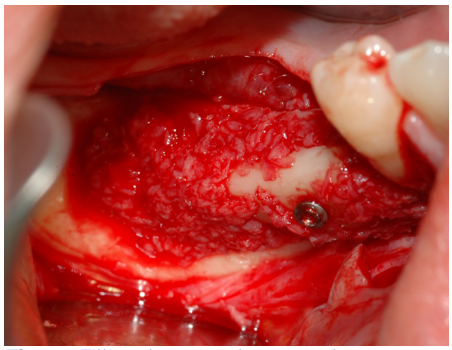

Fig. 5 *– Filling the space between the two corticals with autologous bone chips.*

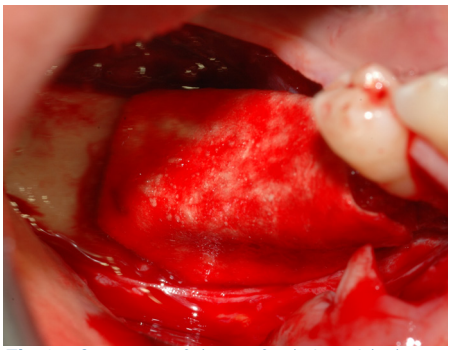

Fig. 6 *– Coverage of the grafted site with the Heart pericardium membrane.*

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Results

The case describes the implant-prosthetic rehabilitation of a patient partially edentulous in the fourth quadrant. Clinical and radiographic examination showed a marked crestal atrophy horizontally.

A two-step procedure was scheduled with one surgery site only, entailing horizontal augmentation with autologous bone harvested from the ramus on the same side as the reconstruction, followed by placing three implants.

Performing ipsolateral harvesting had the purpose of reducing surgery time and patient discomfort during the procedure and in the post-operative course.

After incising and detaching a full-thickness flap along the bony ridge of the ramus and extending it to the rising ramus of the mandible, a portion of cortical bone was taken by using a piezoelectric instrument and a rotary blade (MicroSaw Frios, Dentsply, USA).

A bone scraper was used to harvest cortical bone chips. The bone flap was then secured to the receiving site on the medial side only, creating a gap between the lingual cortical wall and the graft, which was filled with the autologous frustules taken from the ramus. The whole was covered with the Heart pericardium membrane.

Five months later, implant positioning was performed at 4.5, 4.6 and 4.7 after taking biopsies for histologic analysis. The implants (XiVE, Dentsply, USA) were uncovered after three months, and the provisional prosthesis was fitted on after a further three months.

Final rehabilitation was completed seven months later.

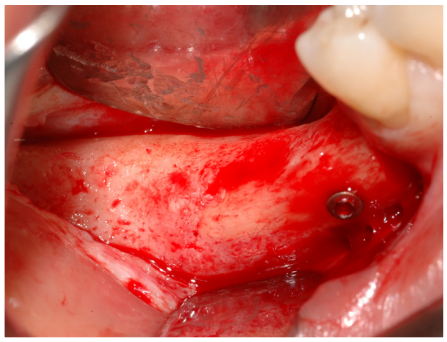

Fig. 7 *– Reopening the regenerated site. The osteosynthesis screw highlights the graft positioning point; notice the excellent integration between the graft and the recipient site.*

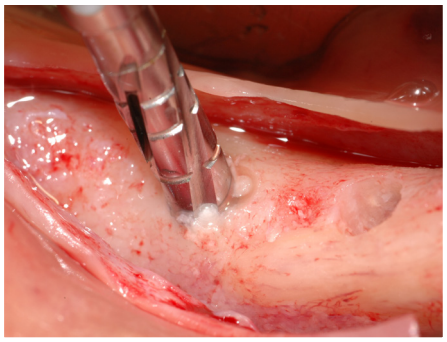

Fig. 8 *– Taking bone cores from the implant positioning sites.*

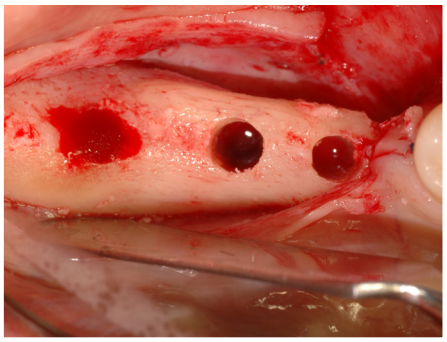

Fig. 9 *–Implant osteotomies. Notice the abundant bleeding of the sites, indicating good engraftment and representing a preparatory factor for osseointegration.*

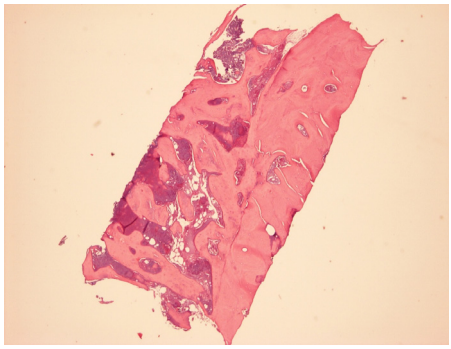

Fig. 10 *– Hematoxylin/eosin staining of a bone core taken from the regenerated site. Notice the preponderance of eosinophilic material, corresponding to newly formed bone.*

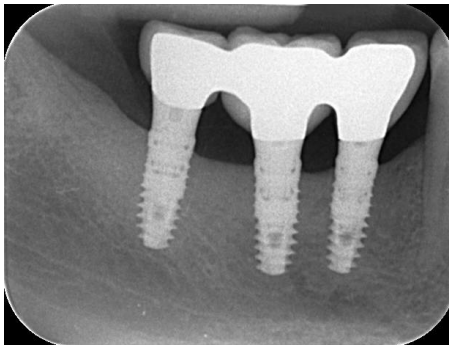

Fig. 11 *– Intraoral X-ray six years and four months after implant placement showing the properly inserted implants and preservation of the vertical bone volume.*

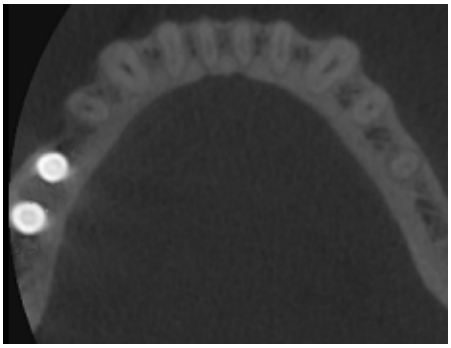

Fig. 12 *– Cone Beam CT scan performed six years and seven months after implant insertion highlighting preservation of the horizontal volume of the grafted site.*

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