

Clinical Sheet

POST-EXTRACTIVE SOCKET MANAGEMENT

Delayed post-extractive implant and peri-implant regeneration with equine origin bone substitute mixed with autologous bone and pericardium membrane.



Prof. Danilo Alessio Di Stefano
Private Practitioner
Milan, Italy
distefano@centrocivitali.it

The tooth extraction is associated with the loss of bone ridge volume. During healing of a post-extraction site, in fact, the alveolar bone undergoes an atrophy process connected to its natural remodeling processes and, specifically, to the loss of periodontal ligament vascularization.

The phenomenon features varying kinetics according to the arch and sector where the socket is and may lead to up to 50% resorption of the ridge volume concerned.¹

Since alveolar resorption may significantly hinder the possibility of implant insertion in an ideal prosthetic position, various post-extractive socket preservation techniques have been developed. The aim is to ensure the largest possible amount of bone is preserved for adequate implant-prosthetic rehabilitation.

¹ Schropp, L. et al. Bone healing and soft tissue contour changes following single-tooth extraction: a clinical and radiographic 12-month prospective study. *Int. J. Periodontics Restorative Dent.* 23, 313–323 (2003).

Materials

For the aim of post-extractive socket preservation, a mixture of autologous bone and Osteoxenon (OX) Mix Gel (OSP-OX22, Bioteck, Italy) was grafted.

A slow-resorption pericardium membrane was then placed to protect the site (Heart; HRT-002, Bioteck, Italy). Both materials are treated with the exclusive Zymo-Teck process, which removes the antigenic tissue components without affecting collagen content.

OX Mix Gel consists of a mixture of cancellous and cortical equine bone granules in a water-based inert gel. Thus, granules are ready for use as they do not require hydration in saline prior to application.

The Heart membrane is obtained from equine pericardium. The three-dimensional collagen mesh it consists on provides good mechanical resistance and assures long degradation time.



Fig. 1 – Preoperative intraoral radiography showing the bone defect of the post-extractive socket.



Fig. 2 – Incision of the palate and flap detachment.

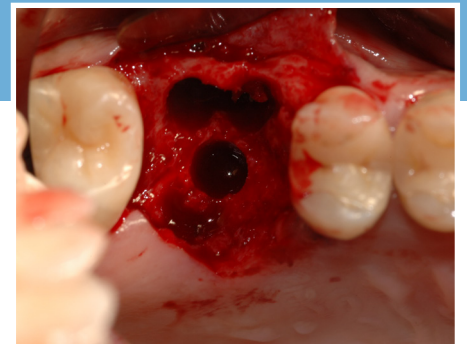


Fig. 3 – The socket after curettage and performing implant osteotomy.

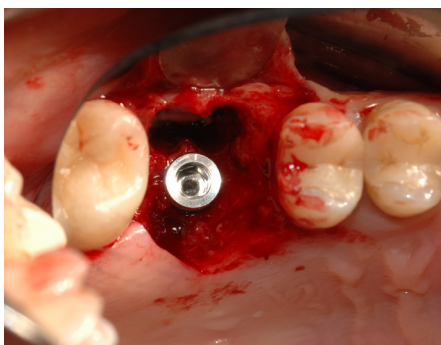


Fig. 4 – The implant in its seat (4.5 x 11mm; Xive, Dentsply, USA).

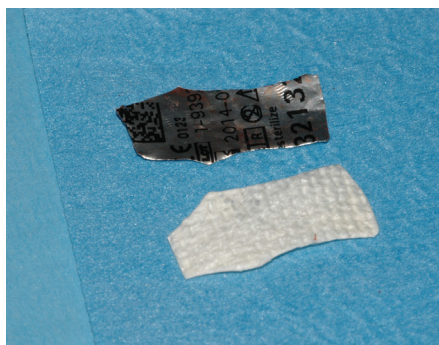


Fig. 5 – The pericardium membrane is cut to the site's shape and size with the aid of a template.

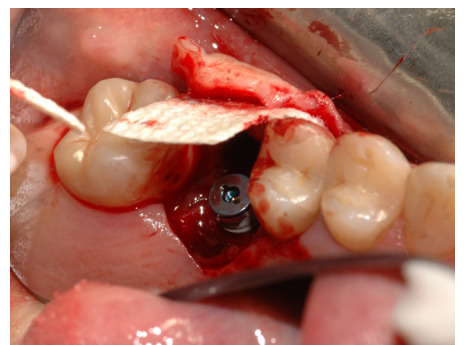


Fig. 6 – The Heart membrane is tucked under the vestibular side of the flap.

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Results

The case concerns a patient undergoing extraction of the second upper left molar and implant insertion in the post-extractive socket. The residual socket featured an extensive bone defect.

For greater procedure predictability, delayed implant placement and peri-implant regeneration were opted for, in order to obtain appropriate soft tissue to cover the grafted site and the membrane.

One month after extraction, a full-thickness palate flap was incised and detached. The post-extractive socket was debrided and curetted and, after preparing implant osteotomy, the implant was inserted (Xive, Dentsply, USA).

A slow resorption equine pericardium membrane was placed to cover the socket. The membrane was molded according to the shape and size of

the socket and tucked under the flap along the vestibular side of the alveolar socket.

The graft was performed with a mixture of autologous bone taken during preparation of the implant tunnel and a biomaterial in syringe, consisting of cortical and cancellous equine bone granules made antigen-free.

The pericardium membrane was then tucked underneath the palatal side of the flap for effective containment of the grafted material. The soft tissues were sutured with non-resorbable, monofilament single stitches.

Four months after implant placement, the implant was exposed and the healing screw was applied. One month later the temporary prosthesis was screwed on and, after another month, the final abutment and crown.



Fig. 7 – The mixture of autologous bone and OX Mix Gel. The biomaterial is contained in sterile syringes for easy application.

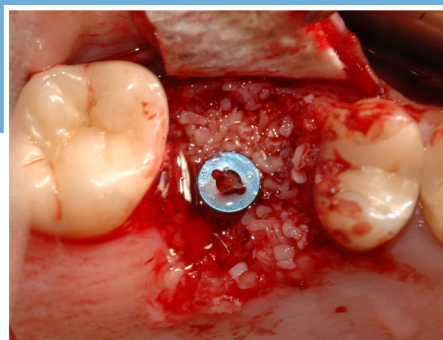


Fig. 8 – Filling the alveolar gap around the implant.

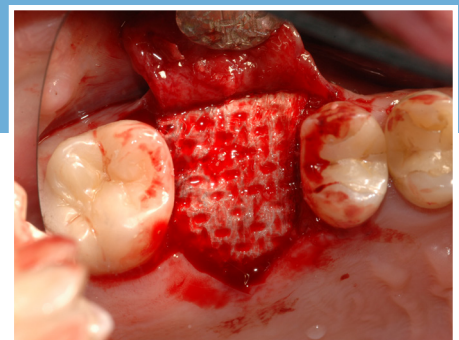


Fig. 9 – The Heart membrane tucked in the palatal side to cover the graft.

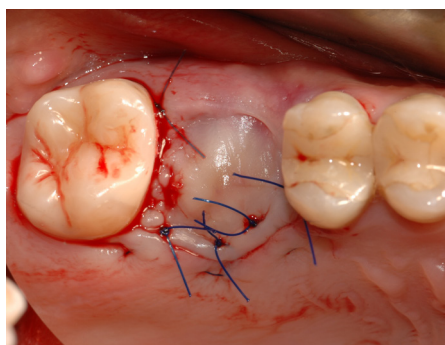


Fig. 10 – Closure of soft tissue by non-resorbable stitches. The presence of adequate soft tissue is to assure healing by primary intention.

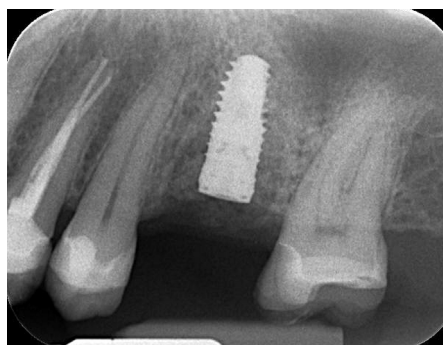


Fig. 11 – Post-surgery control X-ray highlighting correct placement of the implant in the grafted socket.



Fig. 12 – Intraoral X-ray 5 months after insertion. Notice the appreciable bone socket trabecula in the regenerated site.