Vertical GBR by using heterologous bone block and non resorbable membrane

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CASE REPORT

Premise

The lack of mechanical stimuli, periodontal disease, trauma and neoplasms involve resorption both vertically and horizontally of the bone base. In the rehabilitation of the stomatognathic system, three-dimensional restoration of the bone bases is required.
With restoration procedures on implants, this need has become even more pressing. Valid and long-lasting results are obtained with bone regeneration (GBR), as evidenced by the literature.
Currently, possible uses for the stabilization and isolation of the graft concern harvesting intra- and extra-oral, homologous and/or heterologous grafts or a mix between the two, the use of grids or non-resorbable membranes. This case report deals with a type of graft of equine origin, made antigen-free by means of enzymes at 37°C, preserving the collagen matrix, in combination with a GBR technique.

Purpose

The purpose of this paper is to evaluate whether, by using a biomaterial of heterologous origin (equine) in blocks in conjunction with a non-resorbable membrane, one is able to achieve optimal vertical regeneration, in order to place implants of adequate diameter and height, without having recourse to intra-oral or extra-oral harvesting. Finally, the regenerated volume and primary implant stability will be evaluated.

Materials

An appropriately molded 10x10x20mm block of cancellous bone (OSTEOXENON®, Bioteck, Italy) was used. The membrane used is in ePTFE, non-resorbable and reinforced with titanium (Gore® TR9Y, Gore, Sweden). Neoss® implants were placed in the regenerated site (Neoss Implant System, England). Graft and membrane were fixed with Ace Surgical® screws (USA). The suture was performed with Gore® cv5 Gore-tex and Heticon® silk, both 4-0. The impression material is polyether (Impregum/Permadyne, 3M, Italy).

Methods

55-year-old patient with vertical resorption of the 4th quadrant due to previous extractions of diatoric teeth with vertical loss of about 10 mm. (photo 1-2-3). The patient requires prosthetic rehabilitation of fixed type with restoration of occlusion.
Medical history indicates that the patient is healthy and smokes the pipe. Dental formula missing the 4 eighths, 45, 46, 47. No periodontal probes. In view of the need to use a regenerative technique, patient was advised not to smoke the pipe. The patient agreed and does not currently smoke. In pre-surgical treatment, we performed hygiene procedure on the four quadrants and prescribed an antibiotic therapy with amoxicillin 875mg + clavulanic acid (Augmentin, Glaxo, Italy 1x3x6) in association to ketoprofen 50 mg (Orudis Aventis, Italy 1x2x3) and rinses with chlorhexidine digluconate 0.2% 2/3 times a day.

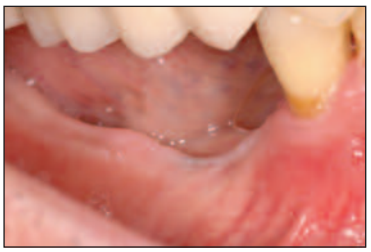

Photo 1

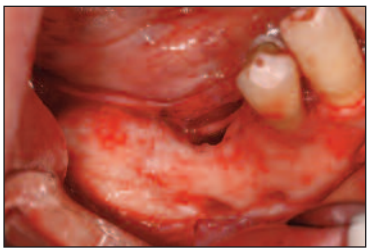

Photo 2

Photo 3

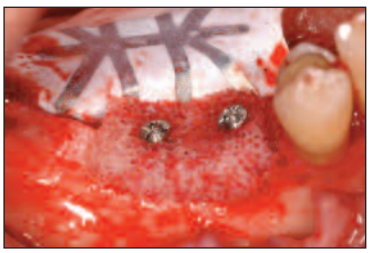

Photo 4

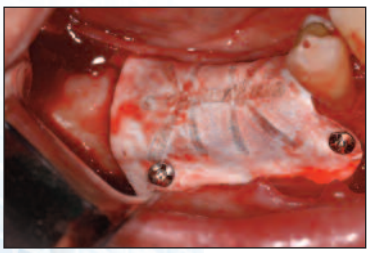

Photo 5

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A crest incision was performed starting from a distal position with respect to 44 with discharge on the mandibular angle and in mesial position with respect to 43. Skeletonization was then performed followed by periosteal vestibular incision and release of the lingual flap to have sufficient tissue to cover the graft. The bone graft was then positioned on the crest with two 12mm-long osteosynthesis screws using, as the highest point, the distal peak of 44 (photo 4). For lingual and vestibular fixation of the membrane, two 4.5mm screws were used (photo 5). Tension-free sutures were performed with closure and healing of the flaps by primary intention (photo 6); the suture was removed after 12 days. **Six months later,** through the same incision, the screws and the membrane were removed, exposing **the graft, which appeared compact and not resorbed with respect to the initial dimensions.** Upon removing the fixing screws, **rich vascularization was observed** (photo 7). Two implant sites were then prepared, where two implants were placed (4.2mm x 11mm) with torque 30 Nxcm (photo 8). Sutures were made and healing by primary intention ensued. **Two months later** the healing screws were inserted (photo 9). After two weeks, the impression was taken to make two temporary screwed teeth. The provisional prosthesis was in under-occlusion. After two more months (ten months after the graft), the final prosthetic teeth were positioned with the cementing technique (photo 10).

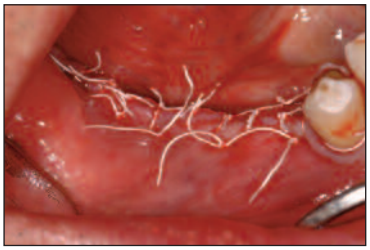

Photo 6

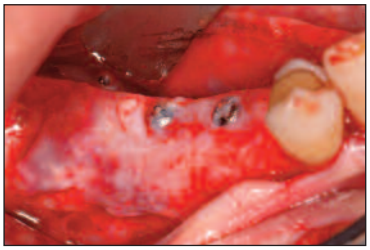

Photo 7

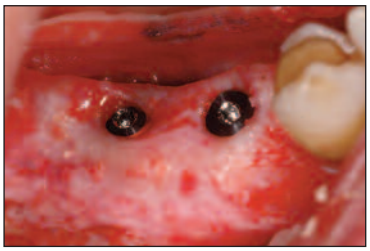

Photo 8

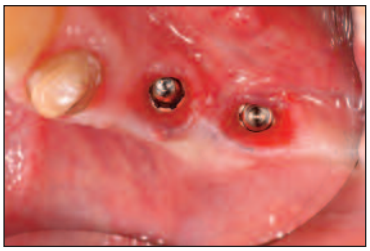

Photo 9

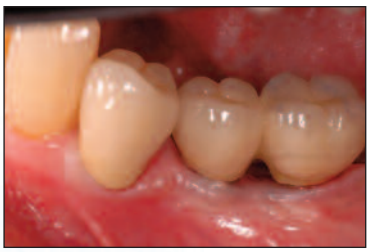

Photo 10

Conclusions

Today, state-of-the-art research on biomaterials seeks to meet the need to be able to work with bone substitutes that support physiological remodeling, volumetric and fixing stability, in view of prospective use of bone growth inducers.

The block in question seems to have the necessary requirements to soon take center stage in bone regeneration. Its **natural compactness and ease of handling** allow the clinician to improve surgery performance, assuring predictability hence success. When the market provides the option of using slowly resorbable membranes, the event of exposures – not so rare with non-resorbable membranes – will become less risky and more manageable. This will be covered by one of the next cases.

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