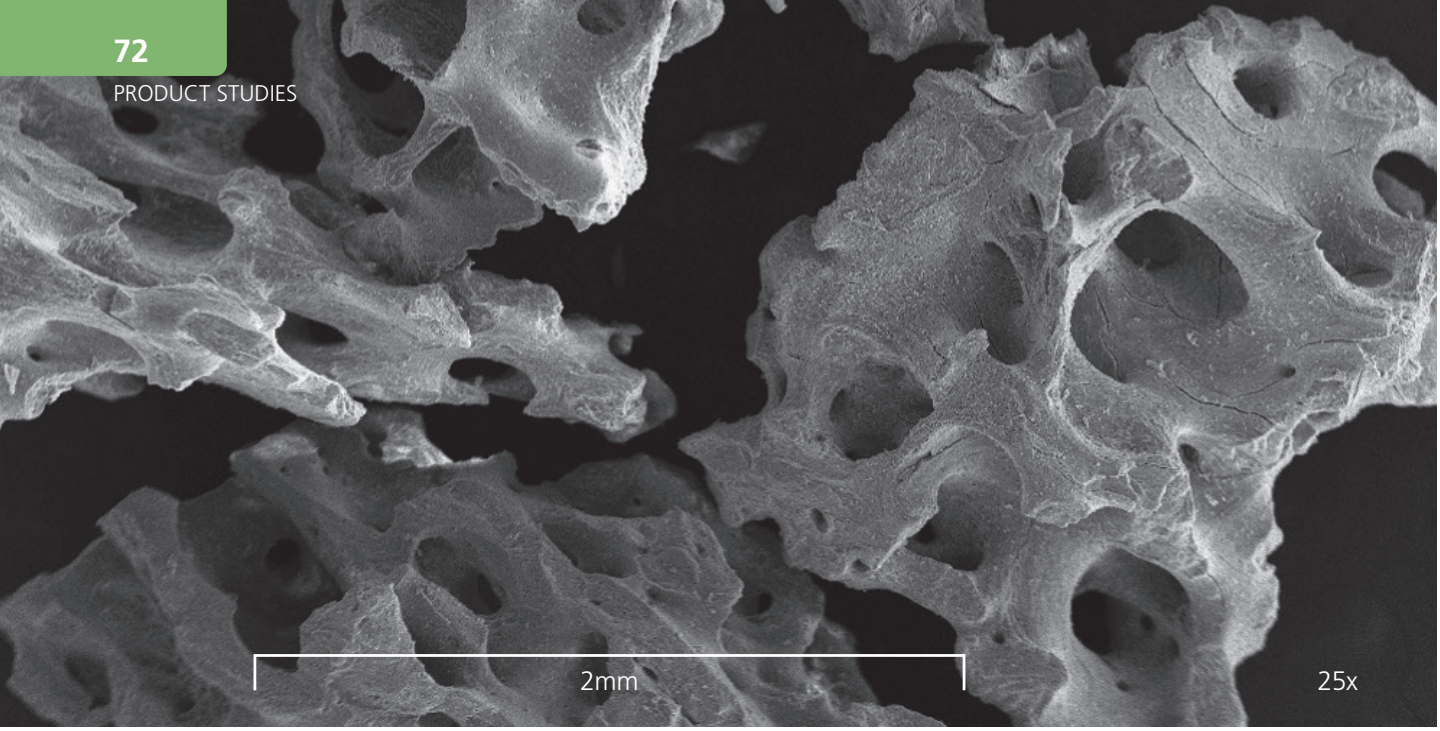

BioHorizons Camlog product report

More room for more bone formation

The correct choice of biomaterials is crucial to achieve optimal clinical results—in functional, structural and aesthetic terms. The aim of any tissue regeneration technique, and bone grafting in particular, is to achieve formation of living and reactive tissue. This should be able to regenerate itself such that the mechanical and biological function is maintained sustainably.

In a randomised comparison study of bovine-derived (MinerOss X) and porcine-derived bone grafts (MinerOss XP) in molar or premolar extraction sockets covered with a collagen membrane (Mem- Lok® Pliable) in 18 patients, Guarnieri and colleagues detected no differences in terms of dimensional vertical and horizontal changes at the extraction sockets between the two groups[1].

In sockets that were grafted using the bovine-derived bone material, the mean ridge width and the average heights of the vestibular and the lingual crest were reduced by 1.25±0.7 mm, 1.18±0.8 mm and 1.12±0.9 mm, respectively. For the group whose sockets were augmented using porcine-derived bone, the reductions were 1.19±0.4 mm, 1.21±0.8 mm, and 1.09±0.6 mm respectively (Fig. 1).

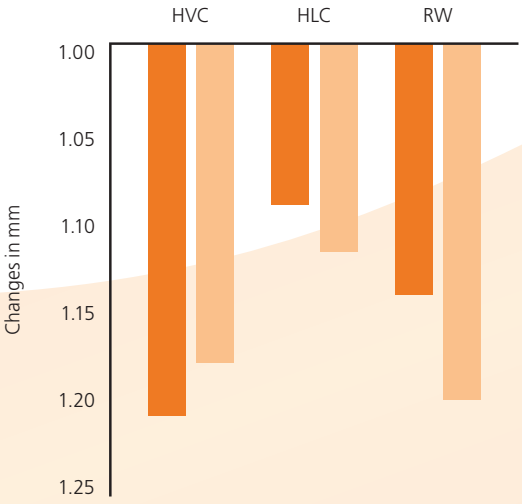

Fig. 1: Horizontal and vertical changes at re-entry surgery. HVC: height of the vestibular bone ridge; HLC: height of the lingual bone crest; RW: ridge width.

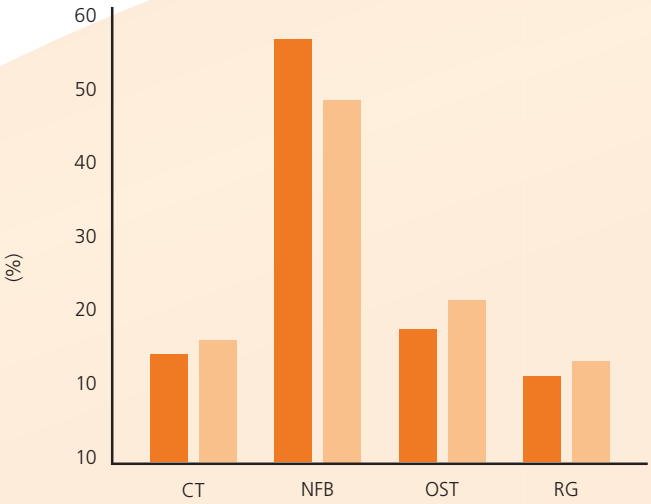

Fig. 2: Histo-morphometric mean values. CT: connective tissue, NFB: newly formed bone; OST: osteoid tissue; RG: residual graft.

The different histological results between the two groups

In the assessment of the histomorphometric parametres, statistically significant differences were detected between the two groups (Fig. 2). The percentage of newly formed bone was significantly higher in the group that was treated with porcine-derived bone material compared to the bovine xenotransplant group at four months post grafting (57.13±2.8% vs. 49.08±3.7% of new bone). Conversely, non-mineralised connective tissue (16.37±4.9% in bovine vs. 13.65±3.6% in porcine), residual graft particles and osteoid tissue were present at a higher extend in the sockets treated with bovine material (13.49±2.8% and 21.06±3.8% in bovine vs. 11.74±4.7% and 17.63±3.8% in porcine).

The data also suggest that alveoli treated with a membrane and porcine bone grafts MinerOss XP) leave less residual bone replacement material compared to alveoli treated with bovine bone grafts (MinerOss X). This might indicate a different impact of the bovine- and porcine-derived materials on the bone healing process. This hypothesis is also supported by the higher percentage of osteoid tissue (bone in maturation phase) found after four months in extraction sockets grafted with bovine-derived bone.

Bone mineral matrices must be biocompatible and fulfil four key properties to promote bone formation and to allow efficient tissue regeneration. In summary, the properties of an "ideal" bone graft enable bone growth in the augmented site and lead to stable osseointegration with minimal host response. Osseointegration is defined as the formation of new bone at the direct interface between an endosteal implant or bone substitute material and the native bone without intervening soft tissue[2].

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