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The impact on the healing of bioactivation with argon plasma of a xenogeneic graft with adequate fixation but poor adaptation to the recipient site: an experimental study in rabbits

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ABSTRACT

Based on the consideration that bioactivation of a xenogeneic block with argon plasma might improve healing in augmentation procedures, the aim of the present split-mouth design study in rabbits was to evaluate the impact on the healing of bioactivation with argon plasma of a xenogeneic graft with adequate fixation but poor adaptation to the native host bone. The experiment was performed with xenogeneic block grafts of similar dimensions. One block was bioactivated with argon plasma (plasma sites), while the other was left untreated (control sites). Customized blocks of collagenated cancellous bone of equine derivation (OsteoBiol® by Tecnoss®, Giaveno, Italy) were fixed with a titanium screw to both lateral aspects of the mandible angle of rabbits. Collagen membranes were placed on the grafts. Thirty animals were included and euthanized in groups of 10 after 2, 6, and 10 weeks, respectively. Histomorphometric evaluations were performed on ground sections. Newly formed bone was the primary outcome, while the distance between the peak of new bone inside the graft and the upper surface of the graft, the xenograft percentages, and the area of the xenograft were considered as secondary variables. From the performed analysis it was evident that the grafts were consolidated to the recipient sites due to the new bone ingrowth within the graft. Woven bone was also formed at the periphery of the block, propagating from the parent cortical host bone through the body of the graft, reaching the top of the graft surface. Similar patterns of healing were observed in both the plasma and control sites, and no statistically significant differences were found in new bone formation in any of the regions examined.

CONCLUSIONS

A limitation of the present study was the use of a rabbit model, so the translation of the outcomes to humans should be made with caution, due to the different healing rate. Anyway, based on the results, the Authors concluded that bioactivation with argon plasma did not improve the healing.

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