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BASIC RESEARCH

Histomorphometric evaluation of two implant surfaces in cortical and grafted bone - study in rabbits.

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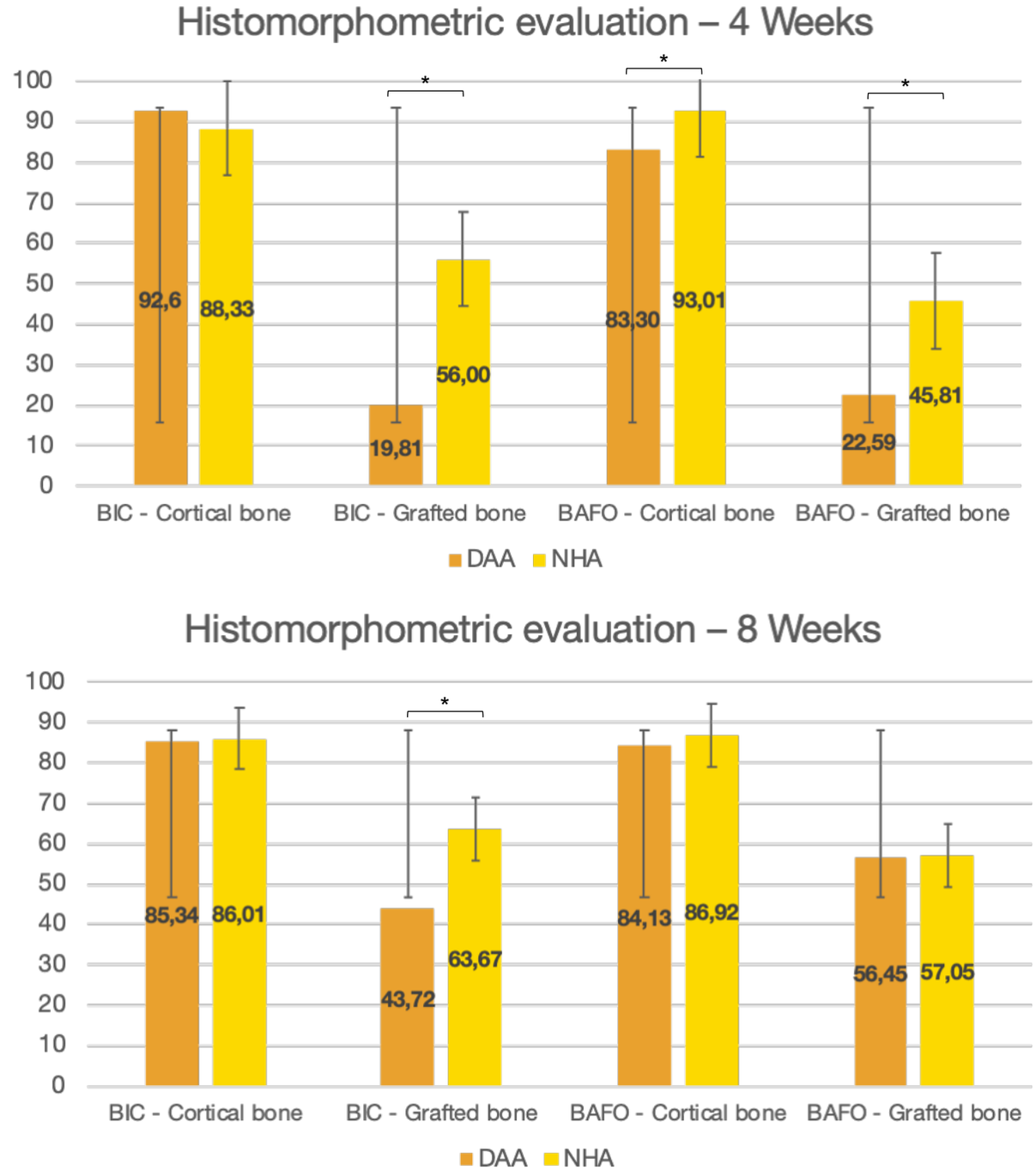
Abstract

The osseointegration depends, among other factors, on the implant surface[1]. The literature describes several ways to obtain changes in microtopography of the implant (titanium plasma and calcium hydroxide, anodizing, sandblasting, etching, laser and combination of techniques)[2]. The micro-texturization of the implants are strategies used to promote better bone anchorage[3]. Topographical modifications of titanium at the nanoscale level generate surfaces that regulate several signaling pathways and cellular functions, which may affect the process of osseointegration[4,5].

Results



Background and Aim

Surface characteristics of dental implants, such as roughness and chemistry, have a direct influence on bone response. Previous studies have shown that changes in implant microtopography may increase *in vivo* bone-to-implant contact (BIC) and lead to improved bone anchorage. Sinus lift procedure is a safe and predictable method to gain bone height for implant placement. The aim of this study was to analyze, in rabbits, the bone response to two different implants surfaces installed after sinus lift procedures, evaluating histomorphometric parameters (BIC and bone area fraction occupancy = BAFO) on the cortical bone and the grafted area.

Conclusion

The Nano-hydroxyapatite coated implants presented better results of BIC and BAFO for the grafted bone, after 4 and 8 weeks. The cortical bone around implant neck presented higher values of the evaluated parameters for both surfaces, when compared to the grafted bone. The NHA implants should be tested in human controlled clinical trials evaluating sinus lift procedures. This research was financed by FAPESP (São Paulo Research Foundation, Grant 2016/22970-0).

Methods and Materials

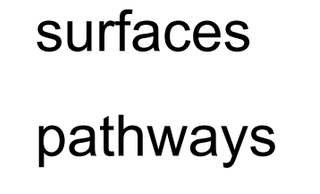


Fig. 1 - Trephine bur preparing the bone window.

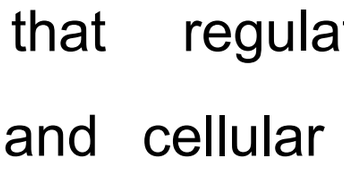


Fig. 2 - Sinus mucosa elevation.

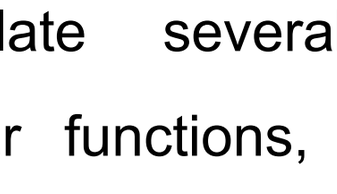


Fig. 3 - Anorganic bovine bone grafts inserted into both sinuses.

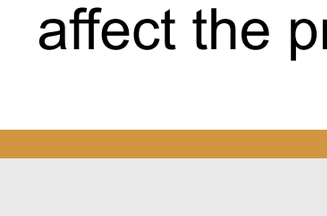


Fig. 4 - Mini implants randomly installed in prepared sites.

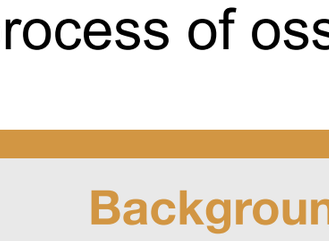


Fig. 5 - Collagen membranes positioned over the windows.

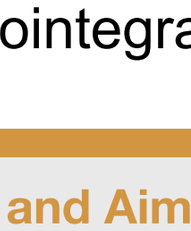


Fig. 6 - Mini-implants (3x4mm)

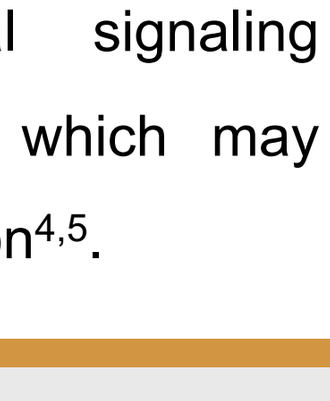


Fig. 7 - Histomorphometric analysis (green line - cortical bone / yellow line - grafted area

References

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