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Early bone healing around implant surfaces treated with variations in the resorbable blasting media method. A study in rabbits"

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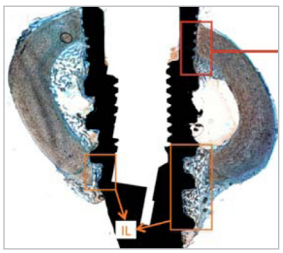
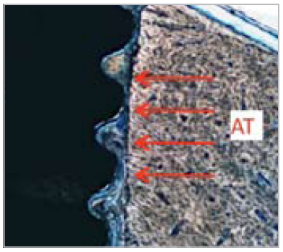
A



B



The bone-implant interfaces were easily visualized and facilitated bone-to-implant contact determination. (A) In general, woven bone formation occurred in intimate contact with all tested surfaces. An apposition type (AT) bone healing was observed at regions where close contact between implant and bone occurred immediately after implantation (B, detail), whereas an intramembranous-like (IL) bone healing pathway was observed where the interplay of the implant macrogeometry and osteotomy dimensions allowed the formation of healing chambers.

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ABSTRACT.

Objective

This study aimed to histomorphologically and histomorphometrically evaluate the *in vivo* response to three variations in the resorbable blasting media (RBM) surface processing in a rabbit femur model.

Study Design

Screw root form implants with 3.75 mm in diameter by 8 mm in length presenting four surfaces (n=8 each): alumina-blasted/acid-etched (AB/AE), bioresorbable ceramic blasted (TCP), TCP + acid etching, and AB/AE + TCP were characterized by scanning electron microscopy (SEM) and atomic force microscopy (AFM). The implants were placed at the distal femur of 8 New Zeland rabbits, remaining for 2 weeks in vivo. After sacrifice, the implants were nondecalcified processed to 30 micro m thickness slides for histomorphology and bone-to-implant contact (BIC) determination. Statistical analysis was performed by one-way ANOVA at 95% level of significance considering implant surface as the independent variable and BIC as the dependent variable.

Results

SEM and AFM showed that all surfaces presented rough textures and that calciu-hosohate particles were observed at the TCP group surface. Histologic evaluation showed intimate interaction between newly formed woven bone and all implant surfaces, demonstrating that all surfaces were biocompatible and osseoconductive. Significant differences in BIC were observed between the AB/AE and the AB/AE + TCP, and intermediate values observed for the TCP and TCP + Acid surfaces.

Conclusion

Irrespective of RBM processing variation, all surfaces were osseoconductive and biocaompatible. The differences in BIC between groups warrant further bone-implant interface biomechanical characterization.