The aim of this study was to evaluate the in vivo effect of antibacterial modified dental implants in the first stages of peri-implantitis. Thirty dental implants were inserted in the mandibular premolar sites of 5 beagle dogs. Sites were randomly assigned to Ti (untreated implants, 10 units), Ti_Ag (silver electrodeposition treatment, 10 units), and Ti_TSP (silanization treatment, 10 units). Coated implants were characterized by scanning electron microscopy, interferometry and X-ray photoelectron spectroscopy. Two months after implant insertion, experimental peri-implantitis was initiated by ligature placement. Ligatures were removed 2 months later, and plaque formation was allowed for 2 additional months. Clinical and radiographic analyses were performed during the study. Implant-tissue samples were prepared for micro computed tomography, backscattered scanning electron microscopy, histomorphometric and histological analyses and ion release measurements. X-ray, SEM and histology images showed that vertical bone resorption in treated implants was lower than in the control group (P < 0.05). This effect is likely due to the capacity of the treatments to reduce bacteria colonization on the implant surface. Histological analysis suggested an increase of peri-implant bone formation on silanized implants. However, the short post-ligature period was not enough to detect differences in clinical parameters among implant groups. Within the limits of this study, antibacterial surface treatments have a positive effect against bone resorption induced by peri-implantitis.

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