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The Inflammatory Hallmark of a Novel Implant in Peri-Implantitis

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Objectives Evaluate the inflammatory outcome of a two-piece novel dental implant (test article) vs. a commercial titanium dental implant in a dog model of experimental peri-implantitis.

Methods The test article was a novel, two-piece pre-assembled implant having a 0.2 thickness sleeve in its coronal 4.2 mm part. Seven Beagle dogs. Ligature-induced experimental periimplantitis model, followed by decontamination and bone grafting. Four groups were assessed according to decontamination and resurfacing protocol: E1 - Experimental 1: Sleeve removed, test article mechanical and chemical decontamination, new rough surface, non-threaded sleeve; E2 - Experimental 2: Sleeve removed, test article mechanical and chemical decontamination, test article remained denuded presenting a turned non-threaded surface; C1 - Control 1: Sleeve remained, test article mechanical and chemical decontamination, original rough surface, non-threaded sleeve; C2 - Control 2: Control article cleaning, mechanical and chemical decontamination of original rough surface, threaded implant. Buccolingual and mesiodistal sections were prepared for each site. Resin qualitative and semi-quantitative histopathologic inflammatory parameters were analyzed.

Results Group C1 showed statistically significant highest signs of residual long-term inflammation, followed by groups E1, C2. Group E2 displayed the lowest local inflammation. Mesio/Distal aspects displayed increased long-term inflammatory infiltrate albeit not statistically significant.

Conclusions Within the limits of the present study, it can be concluded that – 1. The decontamination procedure is more effective in a commercial one piece vs. a two-piece dental implant. 2. Mechanical and chemical decontamination outcome is insufficient. Resurfacing improves the decontamination outcome. 3. Decontamination of turned surface is superior to rough surface.