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Immunohistochemical evaluation of pro-inflammatory molecules in the soft tissue surrounding switching platform implants

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Introduction. Switching platform implants have been proposed to reduce the peri-implant bone loss by shifting the implant abutment interface internally and away from the bone tissue.

Aim of the present study was to characterize the inflammatory infiltrate in the soft tissue surrounding switching and matching platform implants and to evaluate the expression of pro-inflammatory molecules involved in the bone loss.

Material and methods. A total of 32 implants with diameters of 3.8mm, 4.3mm, 4.8mm and 5.5mm were all restored with abutment of 3.8mm of diameter, thus resulting the following implant-abutment mismatches: 0mm (n=10) (control group), 0.25mm (n=7) (test group1), 0.5mm (n=8) (test group2), and 0.85mm (n=7) (test group3). Four years after loading, peri-implant soft tissue samples were harvested and processed for immunohistochemical analysis. Total amount of lymphocytes T (LyT) -B (LyB) infiltrated, and expression of IL-17 and RANKL were detected.

Results. At the harvesting time all sites were clinically healthy. No significant differences were found between groups ($p>0.05$) in terms of infiltrated T and B cells amount, IL-17 and RANKL expression. In all samples lymphocytes T and B were mainly localized close to the junctional epithelium and sparsely detected in the surrounding connective tissue. The distribution of IL-17 and RANKL staining resulted strictly correlated to the inflammatory infiltrated. When pooled data were analyzed, amount of lymphocytes T and IL-17 were higher than respectively lymphocytes B and RANKL. Amount of LyT and LyB were highly correlated (Pearson's $r>0.7$) and IL-17 was moderately correlated (Pearson's $r>0.4$, <0.7) to LyT and LyB.

Conclusions. In the prolonged exposure of the abutment at the oral cavity the configuration of the implant abutment interface may do not affect the inflammatory cellular and molecular pattern responsible for bone loss.

Keywords: dental implants, peri-implant soft tissues, histology, inflammatory cells, human, bone remodeling