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Impact of dental cement on the peri-implant biofilm-microbial comparison of two different cements in an in vivo observational study

Observational Study

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Abstract

Background: The type of cement used in cemented fixed implant-supported restorations influences formation of undetected excess cement and composition of the peri-implant biofilm. Excess cement and dysbiosis of the biofilm involve the risk of peri-implant inflammation.

Purpose: The aim of the study was to investigate the impact of two different cements on the peri-implant biofilm and inflammation.

Materials and methods: In an observational study, the suprastructures of 34 patients with cemented fixed implant-supported restorations were revised. In 20 patients, a methacrylate cement (Premier Implant cement [PIC]) and in 14 patients, a zinc oxide eugenol cement (Temp Bond [TB]) were used. After revision, TB was used for recementation. During revision and follow-up after 1 year, microbial samples were obtained.

Results: Excess cement was found in 12 (60%) of the 20 patients with PIC. Suppuration was observed in two (25%) implants with PIC without excess cement (PIC-) and in all 12 (100%) implants with PIC and excess cement (PIC+). Implants cemented with TB had neither excess cement nor suppuration. The taxonomic analysis of the microbial samples revealed an accumulation of periodontal pathogens in the PIC patients independent of the presence of excess cement. Significantly, fewer oral pathogens occurred in patients with TB compared to patients with PIC. TB was used in all cases (PIC and TB) for recementation. In the follow-up check, suppuration was not found around any of the implants with PIC-, only around one implant with PIC+ and around one implant with TB. Bacterial species associated with severe periodontal infections that were abundant in PIC- and PIC+ samples before the revision were reduced after 1 year to levels found in the TB samples.

Conclusions: The revision and recementation with TB had a positive effect on the peri-implant biofilm in cases with PIC. The cementation of suprastructures on implants with TB is an alternative method to be considered.

Keywords: biofilms; dental cements; implant; in vivo observational study; molecular biological analysis.