

EFFECTS OF OCCLUSAL AND AXIAL HOLES ON THE IMPLANT SUPPORT ON CROWN ADAPTATION AND RETENTION

Objectives: Cement retention is commonly used for implant-supported prostheses despite cement-related issues. The aim is to compare the effects of hole structure on titanium abutments on retention and marginal adaptation of cement-retained implant-supported prostheses when using three different materials. For this purpose, open and closed holes on abutments were used to evaluate the retention and marginal fit of cemented Co-Cr crowns on titanium abutments.

Materials and methods: In the study, abutments with a diameter of 6 mm and Co-Cr crowns were used. The abutments were divided into two groups. In the first group, the abutments had a 10 mm teflon cap on the screw, with both the occlusal and axial holes open. In the second group, only the occlusal opening was covered with temporary cement (cavit) on the 10 mm teflon cap.

Different adhesive agents were used for both groups: 1) Zinc phosphate cement (İnci Dental, Turkey), 2) Temporary cement (İnci Dental, Turkey), 3) Flowable composite (Dentsply Sirona, Germany). Excess cement was standardized with 50N pressure and removed using a scalpel. The samples were evaluated for marginal adaptation using an optical microscope (Leica) at 1.25x magnification. Tensile tests were performed using a universal testing machine (Lloyd Instruments) at a speed of 1 mm/s. The results were statistically analyzed.

Results: Temporary cement (241.546 N-219.505 N) and compomer (16.062 N- 6.928 N) showed a decrease in retention for both open and closed application of the cement escape hole, while an increase was observed in zinc phosphate cement (282.750 N- 358.915 N). Highest retention was observed in zinc phosphate cement, while the lowest retention was observed in the compomer group.

Conclusions: Closed application of zinc phosphate cement is preferred for long-term permanent cementation, while temporary cements are suitable for interim use. Compomers are suitable for very short-term provisional applications.

Keywords: Dental Implantation; Dental Cement; Prosthesis Retention; Dental Marginal Adaptation