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Research Article

Effect of Plasma Treatment on Tensile Bond Strength of (5) Yttrium Zirconia Coping Fixed on Titanium Implant Abutment

ABSTRACT

Objective: The goal of this research is to investigate the effect of plasma surface treatment on retentive strength (RS) between the (5)Yttrium Zirconia coping and the titanium implant abutment (Dentium system) using self-adhesive resin cement. **Methods:** forty standard titanium implant abutments of 5.5 mm height and 4.5 mm in diameter were screwed with implant laboratory analogs embedded vertically in autopolymerizing acrylic resin blocks, forty Zirconia copings with a hole on the occlusal surface were fabricated using CAD/CAM system. Samples were divided into four groups (n 10 for each group); Group (1) no plasma surface treatment for implant abutment and coping (act as control). Group (2) plasma surface treatment for implant abutment only. Group (3) plasma surface treatment for coping only. Group
(4)plasma surface treatment for implant abutment and coping. Coping of all groups were cemented with implant abutment by Allcem dual cure resin cement. All cemented samples were (5000) cycles of thermocycling process and then tensile bond strength evaluated by Universal testing machine, Following the tensile bond strength test, each debonded surface was examined by stereomicroscope at a 20x magnification. The one-way analysis of variance and Duncan test were used to statistically examine the experimental results. **Results:** Plasma surface treatment had observed effect that increase tensile bond strength between titanium implant abutment and (5) yttrium Zirconia coping, plasma surface treatment for abutment and coping (Group 4) was the highest value of tensile strength followed by abutment plasma
surface treatment (Group 2), while lowest value of tensile bond strength in control group (Group 1) and coping plasma surface treatment (Group 3). **Conclusion:** Plasma surface treatment increase tensile bond strength between implant abutment and zirconia coping. Plasma surface treatment for both abutment and
coping provided higher tensile bond strength. Mode of failure was adhesive failure occurs in abutment surface.