

## ABSTRACT

**Purpose:** The purpose of this study was to comparatively evaluate the microgap at the implant-abutment interface with premachined and customized laser-sintered Co-Cr abutments.

**Materials and Methods:** Ten Ti premachined abutments (Group I) and ten Ti customized laser-sintered Co-Cr abutments (Group II) were connected to the Ti implants and then embedded in clear autopolymerising acrylic resin blocks. These blocks were vertically sectioned using a water jet powered sectioning equipment. Scanning electron microscopic images of all the samples were obtained. Using pixel counting software, the microgaps at the implant-abutment interface at the platform level (A, B, C) and internal connection level (D, E, F) were measured on both right and the left sides for each sample of both test groups. The data were subjected to statistical analysis using non parametric Mann-Whitney U test.

**Results:** The mean microgap at the implant-abutment interface at point (IA): 0.774 $\mu$ m for group I and (IIA): 1.888  $\mu$ m for group II samples. The mean microgap at the implant-abutment interface at point (IB): 0.967 $\mu$ m for group I and (IIB): 1.915  $\mu$ m for group II samples. The mean microgap at the implant-abutment interface at point (IC): 2.078 $\mu$ m for group I and (IIC): 2.643  $\mu$ m for group II samples. The mean microgap at the implant-abutment interface at point (ID): 2.313 $\mu$ m for group I and (IID): 6.049  $\mu$ m for group II samples. The mean microgap at the implant-abutment interface at point (IE): 1.927 $\mu$ m for group I and (IIE): 6.110 $\mu$ m for group II samples. The mean microgap at the implant-abutment interface at point (IF): 2.189 $\mu$ m for group I and (IIF): 6.014 $\mu$ m for group II samples. Non parametric Mann-Whitney U test showed statistically significant difference ( $p < 0.05$ ) between two groups except at point C ( $p > 0.05$ )

**Conclusion:** Within the limitation of the study, the mean microgap at the implant-abutment interface at the platform and internal connection level for premachined abutments were significantly lesser compared to that of the customized laser-sintered Co-Cr abutments, even though, the microgaps of both the test groups were within the clinically acceptable range.

**Key words:** Implant-abutment interface, Customized laser-sintered Co-Cr abutment, microgap, misfit, Scanning electron microscope (SEM).