



# Marginal and internal fits of zirconia single crown and Four-unit Fixed Dental Prostheses Substructures

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## Abstract

**Purpose:** To compare marginal and internal gaps of zirconia single crown substructures with those of four-unit fixed dental prostheses substructures.

**Materials and Methods:** A standard Co-Cr model of maxillary first premolar and maxillary second molar abutments was made. Twenty polyether impressions of the standard model were taken and subsequently poured with type-IV dental stone. Zirconia substructures were fabricated as premolar and molar single crowns (Cr, n=10) and four-unit bridges (Br, n=10) using LAVA™ Zirconia system. The gaps between substructures and their standard abutments were evaluated using silicone replica technique. Twenty-two different points were measured along the marginal and internal surfaces. The differences of the gap widths between single crown and four-unit bridge substructures were analyzed using Mann Whitney U-test ( $\alpha=0.05$ ).

**Results:** There was significant difference of marginal gap between Cr and Br groups at mesial marginal gap of molar ( $30\pm44$  and  $112\pm19$   $\mu\text{m}$  for Cr and Br, respectively). For the internal gaps, mid-occlusal point revealed the largest gap. No significant difference of internal gaps between Cr and Br groups was observed except at some points of mesial chamfer area of molar ( $123\pm18$  and  $218\pm33$   $\mu\text{m}$  for Cr and Br, respectively) and at buccal axial wall of premolar ( $45\pm15$  and  $76\pm47$   $\mu\text{m}$  for Cr and Br, respectively).

**Conclusions:** The differences between the gaps of zirconia single crown and those of four-unit bridge substructures were found at the mesial side of molar marginal area. Most of internal gaps of single crown substructures did not significantly differ from those of four-unit bridge substructures.

**Key words:** CAD-CAM, Gap, Zirconia, Fixed dental prostheses, Crown, Bridge, LAVA

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