

**A Comparison of Dimensional Accuracy of the  
Splinted and Unsplinted Impression Techniques  
for Multiple Implant Abutments**

by

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## ABSTRACT

The main objective of contemporary implant prosthodontic technique for definitive cast fabrication is to relate implant analogues in the same manner as the implants or abutments are located intraorally. Movement of direct impression copings inside the impression material during clinical and laboratory procedures may cause inaccuracy in transferring the 3-dimensional spatial orientation of implants intraorally to the definitive cast. Consequently the restoration may require corrective procedures. This in vitro study evaluated the dimensional accuracy of definitive cast produced by four implant impression techniques.

A metal model with 4 implants was fabricated. A total of 40 medium-consistency polyether impressions of the metal model were made with direct impression copings. Four groups of 10 each were made with different impression techniques; in group 1, non splinted square impression copings were used; in group 2, square impression copings previously air borne particle-abraded and coated with the manufacturer-recommended impression adhesive were used; in group 3, square impression copings were used and joined together with prefabricated autopolymerizing acrylic resin bar before the impression procedure; and in group 4, square impression copings were used and joined together with impression plaster material.

Impressions were poured with Die keen dental stone using Zeiser system. Positional accuracy of the abutments was assessed with a travelling microscope at original magnification x30 and recorded the horizontal distances between the 2 most anterior abutments (D1) and the 2 most posterior abutments (D2). These measurements were compared to the measurements made on the metal model which served as control. Data were analyzed with a one-way analysis of variance, followed by Student Newman-Keuls test ( $\alpha=.05$ ).

The data obtained revealed significant differences within the 4 impression techniques ( $p<.0001$ ). The Student Newman-Keuls test disclosed significant differences among the groups ( $p<.0001$ ). Among all the groups, group 1 demonstrated the highest horizontal discrepancy of D1 and D2 compared to the corresponding abutments of metal model ( $p<.0001$ ) where as the lowest horizontal distance variation of D1 and D2 where observed in group 4 followed by group 3, and group 2.

Within the limitations of this study, improved accuracy of test cast was achieved when the square impression copings splinted together with impression plaster were used to make a transfer impression of multiple implant abutments.