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Comparative evaluation of accuracy of impression techniques in parallel and non-parallel implants: an in vitro study

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ABSTRACT:

Introduction : A dental impression is a negative imprint of an oral structure used to produce a positive replica of the structure for use as a permanent record or in the production of a dental restoration or prosthesis. Some mechanical and biological complications may arise due to prosthesis misfit. An accurate placement of implant and impression is required to minimise the marginal misfit of the prosthesis. The aim of this study is to determine the effect of impression technique of parallel and nonparallel implants on the vertical misfit of a three-unit implant prosthesis by using polyvinyl siloxane. Materials and Methods: Two master acrylic models were used in which two implants were placed at parallel and nonparallel position to simulate intraoral condition. Two base-metal frameworks were built on the acrylic casts. Forty impressions were made for both parallel and non parallel conditions with open and close tray technique with polyvinyl siloxane. The marginal gap in the framework were measured using stereozoom microscope at four locations.

Results: It is demonstrated that in all evaluated samples the overall mean shows that the value for vertical misfit for close tray was higher than the open tray. The mean value of misfit was lowest for the open tray/ molar/ buccal area 4.825230 µm whereas the value was highest for the closed tray/molar/lingual area 6.876460 µm. The Mann- Whitney test showed that there was statistically significant difference for the misfit between the close tray and open tray technique for each location. The overall mean shows that the vertical misfit value for nonparallel was higher than parallel group. The mean value for misfit was lowest for the parallel/premolar/buccal area 3.698700 µm whereas the value was highest for the nonparallel/molar/buccal area 7.863680 µm. The Mann- Whitney test showed that there was statistically significant difference between the parallel and nonparallel group for each location. When the intergroup comparison was done for all the groups, using One- way ANOVA the difference between the groups was found to be statistically significant. The Bonferroni post-hoc analysis has been conducted to check which particular group differs

Conclusion: It was concluded that,

1. Vertical misfit of metal framework in terms of impression technique was more accurate when impressions were made with open tray technique and parallel placement conditions produce more accurate marginal fitness.
2. The vertical misfit was less with the open tray technique in parallel condition in buccal area of molar region whereas the misfit was more with the close tray technique in nonparallel condition in buccal area in molar region.

Key Words: Dental implant, impression, open/closed‑tray technique, vertical misfit

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