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Accuracy assessment of different digital impressions protocols for proximal and internal fit: An In-vitro study

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ABSTRACT

Aim & Background*:* There has been a paradigm shift in the accuracy and predictability of fixed restorations with the advent of digital impressions. The purpose of the study was to determine the accuracy- trueness and precision of conventional impression with that of digital impressions for single tooth supported crowns so as to predict internal and proximal fit

Materials and Methods*:* A typodont acrylic resin right mandibular first molar was prepared for an all-ceramic crown. For the purpose of experiment a round diamond bur was used to form indentations at Buccolingual (BL), Mesiodistal (MD), Mesioproximal (MP), Distoproximal (DP) regions. To utilize the three ways of performing scanning namely Intraoral scanning(IOS), Impression scanning(IS) and Cast scanning(CS), 20 scans of each of these groups were made. The group datasets were measured with software built calibrated tools. The scans were checked for precision in each group and the groups were compared with reference value to assess the trueness.

Results: The precision variances for IOS was 23µm followed by 32 µm for impression scans and 36 µm for cast scans. Scans achieved by IOS exhibited highest trueness with SD ranging from 42 µm-55 µm, whereas scans achieve by extraoral scanner had deviation ranging from 57 µm-105 µm.

Conclusion: Precision and trueness were superior for IOS scans. But, the fixed restorations fabricated from IOS and lab scanner would provide a clinically acceptable fit prosthesis as the difference between misfit is less than 150 μm.

Keywords: Intraoral scanner, digital impression, interproximal fit, trueness, precision

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