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A comparative analysis to evaluate finish line accuracy between impressions made by an intraoral scanner under two light sources and a conventional impression technique-An in-vitro study

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ABSTRACT

Background and Objectives:

The advent of intra oral scanners has shown several advantages over conventional impression methods. However, a major shortcoming is its difficulty in detecting deep marginal lines on a prepared tooth. Recent studies have reported that ambient light affects the coordinates measured by 3D scanning, revealing optimum trueness of digital impressions only under specified lighting conditions. Hence, the aim of this study was to compare finish line accuracy of a digital impression under 2 different light sources, with that of a conventional method.

Method:

On a mandible typodont model, a fixed partial denture preparation is made on 36 and 34, with 35 as the pontic space. A reference model scan is first performed using a lab scanner. Scans are obtained for three groups; a conventional impression, digital impression scanned under ambient lighting and another under the specified light source. The STL files of each scan are best fit aligned for 3D Compare analysis using the Geomagic Qualify software.

Result:

The deviations amongst the three groups were statistically insignificant. All three impressions had comparable accuracy, however, the conventional impression scan, showed the most deviation from

reference scan data at -0.003 mm, followed by the conditioned light group at -0.002 mm. The least deviation reading is seen in the ambient light group at -0.001 mm.

Conclusion:

From a clinical perspective, both the digital and conventional impressions provide with efficient accuracies in recording the finish line. It is important that clinicians understand and evaluate the varying technical aspects of digital scans and utilize them to their utmost potential.

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