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A Comparative Study to Evaluate the Accuracy of Conventional and Digital Interocclusal Registration Materials By Three Dimensional Analysis – An Invitro Study

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ABSTRACT

Background:

Precise replication of maxillomandibular relationships is essential for prosthetic success. With the growing integration of CAD/CAM systems, the reliability of interocclusal registration materials becomes critical.

Aim:

To evaluate and compare the accuracy and dimensional stability of conventional polyvinyl siloxane (PVS) and scannable PVS interocclusal registration materials at different interarch separations.

Materials and Methods:

Interocclusal registrations were made using a Hanau H2 semi-adjustable articulator with three materials: conventional PVS, scannable PVS-1, and scannable PVS-2. Bite records were digitized and analyzed by STL-based 3D superimposition. Root Mean Square (RMS) error and mean linear deviation were calculated. One-way ANOVA with Tukey's post hoc test was applied for statistical analysis.

Results:

Material type significantly influenced the accuracy of occlusal record reproduction. Scannable PVS-1 demonstrated the lowest RMS error and average deviation, indicating superior accuracy, while conventional PVS recorded the highest error.

Conclusion:

Scannable PVS materials showed greater precision and scanner compatibility, ensuring improved integration into digital workflows. Their use can enhance prosthetic fit, reduce chairside adjustments, and improve overall clinical efficiency.

Keywords: Interocclusal registration, Scannable PVS, Digital dentistry, CAD/CAM, Occlusal accuracy

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