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Casting ability of selected impression materials tested in different conditions in an in vitro sulcus model.

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Objective: To test casting capacities of impression materials under dry and wet sulcular conditions in vitro.

Method and Materials: An incisor with a circular shoulder preparation (1 mm) was inserted in a primary mold. A shiftable secondary mold allowed adaptation of sulcular depth (1 to 4 mm). An outer circular chamfer assured reproducible positioning of an impression material carrier. Tested materials were PVS of differing viscosities (extra low, Panasil Contact Plus [ELV]; low, Affinis Light Body [LV]; and medium, Virtual Monophase [MV]) and one polyether material of low viscosity (Permadyne Garant [PE]). Impressions were made with sulcular depths of 1 to 4 mm in wet and 1 and 4 mm in dry conditions, cut in half, and digitized with a light microscope (Stemi SV8). Surface area of the region of interest (ROI, at inner angle of preparation) was determined with Optimas 6.2.

Medians were calculated, and statistical analysis was performed using the Mann-Whitney U test (P # .05).

Results: Median values of the measurements under wet condition demonstrated the smallest ROI areas for the ELV (297-330[pixel]) and the MV (253-421[pixel]) materials followed by the LV (582-745[pixel]) and the PELV (544-823[pixel]). All materials showed significantly higher values for the wet compared to dry sulcular conditions.

Repeated measurements showed no significant differences to the corresponding first determined series.

Conclusion: The sulcus model is applicable to assess casting abilities of impression materials in clinically approximated sulcular conditions. The PVS materials with extra low and medium viscosities showed the best properties in dry and wet conditions.