COMMENTARY

Flow Profile of Regular and Fast-Setting Elastomeric Impression Materials Using a Shark Fin Testing Device

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Accurate impressions and casts are key components of successful treatment in dentistry. Physical and chemical properties of impression material can affect the accuracy of impression. There are several impression materials available on the market, and they are supplied in varying consistencies. This article compares the flow properties of some of the commonly used light-bodied elastomeric impression materials and explains the importance of flow as an important property that may contribute to the accuracy of impressions.

In this study, a shark fin testing device was employed with added weights to closely simulate the average seating forces that are applied while taking an impression. According to the article, shark fin heights correlate to the flow of the material; higher shark fin values correspond to greater flow. Among the five impression materials that were compared, polyether impression material (Impregum) provided higher values of shark fins through most of its working time. In fact, the data point at each time interval was consistently comparable with the next data point at the successive time interval; however, after the 2-minute time interval, the shark fin height began to decrease. This can be explained by the "snap-set" behavior of polyether impression materials, whereby the material remains plastic during its working time, and at the end of the working time, it transitions into elastic form.¹ It can also be explained by the rheological studies done by McCabe and colleagues, which establish that the tan δ value is slow in comparison with materials such as poly vinyl siloxane (PVS). Although PVS develops elastic properties soon after mixing, polyether impression materials (Impregum) maintain a plastic state initially and transition into the elastic phase toward the end of their working time, they can take a single impression of multiple preparations while maintaining comparable flow and clinical efficacy of the impression material.

The authors mentioned that further studies are needed that must closely simulate the oral conditions in terms of presence of saliva, and so the shark fin test may be carried out in the presence of simulated saliva. It would be interesting to compare the results of their further testing to this study and see how the test results vary considering the hydrophilic nature of polyether and an initial hydrophobic nature of PVS. The hydrophilic nature of polyether impression materials is considered advantageous because it renders better wetting properties and allows accurate reproduction of surface details.³ Other factors that may be considered include temperature and humidity because an increase in both these parameters decreases the working time.¹

This study shows that among other properties of impression materials, flow profile is also an important consideration and affects the overall accuracy of the impression.

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