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Evaluation of horizontal and vertical tooth movement changes during processing of a maxillary complete denture using heat cure acrylic resin in conventional, layered silicone rubber and layered type-4 gypsum flasking techniques
(A Comparative In-Vitro Study)

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Abstract

Purpose: The purpose of this study is to comparatively evaluate the influence of three flasking methods (conventional, layered type-4 gypsum and layered silicone) on the vertical and horizontal tooth movement changes during maxillary complete denture processing (An In-Vitro study).

Material and Method: For the present experimental study the sample size was 30 maxillary complete dentures. This was comprised of 3 groups depending upon the investing technique used in the fabrication process. All groups were of equal size i.e. 10 dentures each

Group-1- Investing technique using only dental plaster; type-2 gypsum


Group-2- Investing technique using die stone; type-4 gypsum as a second pour

Group-3- Investing technique using addition silicone putty as a second pour.

Measurements were made before investing and after processing of a denture in both vertical and horizontal planes using certain reference points (six and four sites respectively). For each sample vertical measurements were made at six sites (ab, ab', ac, ac', ad, ad') and horizontal measurements were made at four sites (AB, CD, AD, BC) using digital vernier calliper's and the differences between the pre- and post-polymerization were calculated and the data subjected to the statistical analysis to determine the significance. Descriptive statistical analysis was performed to calculate the cumulative Mean \pm SD and further student's t- test, one way ANOVA was employed to determine the significance level between the three groups.

Results: Student's t- test revealed that vertical (-0.009 ± 0.069) and horizontal (-0.034 ± 0.040) tooth movement was significantly different in group- 3 (layered silicone putty) ($P < 0.05$) when compared to other two groups and One way ANOVA test between the group-2 and group-3 shows the group-3 is statistically significant at $p < 0.05$ in both vertical and horizontal planes, which manifests that silicone rubber material is remarkably superior than the gypsum material (dental plaster, die stone).

Conclusion: Within the boundary of the limitations silicone rubber can be a superior investing material to reduce the tooth movement in both vertical and horizontal planes than the type-2 and type-4 gypsum products.

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