BRUSHING INDUCED SURFACE ROUGHNESS OF TWO NICKEL BASED ALLOYS AND A TITANIUM BASED ALLOY: A COMPARATIVE STUDY- IN VITRO STUDY

by

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ABSTRACT

Background and Objectives: Alloys with high nickel content have been increasingly used in the dentistry. Alloys have high corrosion rates when exposed to chemical or physical forces that are common intra orally .Titanium is the most bio compatible materials for crowns, fixed partial dentures and implants in the present use but paradoxically the self protective oxide film on the titanium can be affected by excessive use of the commonest preventive agents in dentistry. Therefore this study is undertaken in order to draw attention towards the potential effect of prophylactic brushing in a saline medium.

Method: Forty five wax patterns in equal dimensions of 10x10x2mm were cast in Titanium (grade II) and Nickel-Chromium. Out of the forty five wax patterns, fifteen wax patterns were used for preparing cast Titanium samples and thirty wax patterns were used for preparing cast Nickel-Chromium samples and polished . These samples were divided into 3 groups of 15 samples each. They are brushed for 48 hours each clinically simulating 2 years of brushing in a saline tooth paste medium. The surface roughnesses of the samples were evaluated using Profilometer, SEM and EDS .Results were subjected to statistical analysis.

Results: The statistical analysis of the Rz and Ra surface roughness values were calculated. Significant difference of surface roughness was present in the Titanium samples compared to that of the MAARC and WIROLLOY (nickel chromium) samples after the study. To know the difference in the values of all samples before and after, Student paired "t" test was carried out. Results showed that there is significant change in the Rz and Ra values of titanium samples.

Interpretation and conclusion: The present findings suggest that, prophylactic brushing with the fluoridated tooth paste have an effect on the surface roughness of Titanium and also to a certain extent, on Nickel-Chromium. Therefore careful consideration must be given to the selection of the tooth brushes and tooth pastes with the medium abrasives in patients with these restorations.

Keywords: Titanium, WIROLLOY, MAARC,