

**Evaluation of the Effect of
Surface Roughness of Glazed and Polished
Porcelain on Adhesion of Oral
Streptococcus Mutans (An *In Vitro* Study)**

A Thesis

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Abstract

Statement of problem. Dental plaque has harmful influence on periodontal tissue and when refinishing porcelain restoration is inevitable, the increase in surface roughness allows adhesion of plaque and its components.

Purpose. This study evaluated the effect of surface roughness of glazed and polished porcelain on the adhesion of oral *Streptococcus mutans* in vitro.

Materials and methods. 80 metal-ceramic specimens were prepared in form of disks according to the manufacturer instructions from two porcelain materials: VITA VMK 95 and MAJOR; and divided into four groups according to the method of surface treatment as follows:

Group A: Polished with silicon polishing burs.

Group B: Polished with sand papers “240-grit”.

Group C: Sandblasted using aluminum oxide particle size 50 µm.

Group D: Glazed by adding glaze material.

Surface roughness values (Ra -µm) for all specimens were recorded using profilometer. *Streptococcus mutans* bacteria were isolated from saliva and all specimens were inoculated in test tubes containing bacterial suspension allowing adhesion to occur. After incubation for 24 hours at 37°C, specimens transferred to sterile saline solution and an inoculum of 0.1 ml from each selected dilution was spread on the selective medium (mitis salivarius bacitracin agar). Count of bacteria was recorded expressed in colony forming unit (CFU) taking in consideration the dilution factor.

Results. There was significant correlation ($p < 0.05$) between surface roughness values ($Ra-\mu m$) and the amount of bacterial adhesion (CFU $\times 10^3$). No statistical difference was found between the two types of porcelain materials, and the glazed surface was the smoothest and exhibited the least amount of bacterial adhesion.

Conclusions. According to the conditions of the study, a positive correlation between surface roughness and the amount of bacterial adhesion was observed. The glazed porcelain surface exhibited the least amount of bacterial adhesion and considered more biocompatible than other methods of porcelain surface treatments.