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Evaluation of the Effect of Alcohol Presence in Mouth Washes on Force Degradation of Different Configurations of Elastomeric Chains (An *in Vitro* Study)

A Thesis
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Abstract

Elastomeric chains are one of the most commonly used force delivery systems. They have the ability to exert an interrupted force, convenience of use, compatibility to oral environment and cost effectiveness despite of the inherited disadvantage which is force degradation.

This *in vitro* study was designed to evaluate the effect of alcohol presence in mouthwashes on force degradation of different configurations of clear elastomeric chains from Ortho Technology company which are: closed, short and long under the effect of time at different intervals (Initial, 1day, 1, 2, 3 and 4 weeks) with exposure to different chemical solutions.

A total of (540) elastomeric chains of three different types (long, short and closed) transparent in color, with an initial length (19mm) and about 50% extension (29mm) were used for the study. These elastomeric chains was divided into four groups and exposed to different chemical solutions (Distilled water, Listerine Original alcoholic mouthwash, Listerine Zero alcohol mouth wash, Ethanol 26.9%) twice daily for 60 seconds each according to manufacturer's instructions to measure the amount of force degradation in different time intervals. These elastomeric chains were incubated in covered glass containers at 37C˚ for the entire testing period.

The results of the present study showed that the elastomeric chains were greatly affected by time, the majority of force loss occurred after the first 24hr. then followed by a less steep gradient for the rest of the working period.

We can conclude that alcoholic mouth wash (Listerine Original) causes an increase in force degradation of all types of elastomeric chains while alcohol free mouth wash (Listerine Zero) causes less force degradation of all types of elastomeric chains, additionally closed configuration elastomeric chains has the least percentage of force degradation than other configurations of elastomeric chains.