

**The Effect of Different Orthodontic  
Elastomeric Ligatures on Frictional  
Resistance**

**(An in-vitro study)**

*A Thesis*

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# Abstract

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Most of orthodontic treatments involve sliding mechanics especially in overjet reduction or space closure; the major disadvantage with the use of sliding mechanics is the friction that is generated between the bracket and the archwire during orthodontic movement.

The aim of this study was to evaluate in vitro the effect of variations in the color, cross section and also the manufacturer difference of elastomeric ligatures on the static frictional resistance generated by orthodontic sliding mechanics under dry condition.

An Instron testing machine was used to assess the static frictional forces of a  $0.019 \times 0.025$ -inch stainless steel wire that was ligated to the convertible tube of the first molar and to three stainless steel 0.022-inch pre-adjusted brackets with elastomeric ligatures with different manufacturers (G&H Germany, Glenore USA, Ormco USA, 3M Unitek USA and OrthoMatrix USA), all were clear and with same size (medium). Also with different colors (clear and gray) and different cross sections (circular and rectangular) of OrthoMatrix.

A statistically high significant differences presented among all companies ranging from the least one 3M Unitek, OrthoMatrix, Glenore, G&H and the highest was Ormco.

A non significant result shown in comparison of clear and gray color elastomeric ligatures of OrthoMatrix.

High significant difference occurs in comparison between rectangular and circular cross-sections elastic ligatures of OrthoMatrix, and the rectangular was the highest.