

*Republic of Iraq
Ministry of Higher Education
And Scientific Research
University of Baghdad
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THE CYTOTOXICITY OF ORTHODONTIC ELASTOMERIC LIGATURES

(IN VITRO COMPARATIVE STUDY)

A thesis submitted to

*The council of the College of Dentistry at the
University of Baghdad, in partial fulfillment of the
requirements for The degree of Master in Science of
Orthodontics*

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November 2013

Muharam 1435

Baghdad – Iraq

Abstract

Elastic ligatures are tiny rubber bands that are used to hold the archwire and bracket together during orthodontic treatment (braces). These elastic bands are available in a variety of colors. As these materials are widely used in clinical orthodontics, care regarding the cytotoxicity of orthodontic elastics should be taken, mainly with regard to intraoral elastics as they have a very close contact with gingival and mucosa.

The present study was carried out to evaluate the cytotoxicity of orthodontic elastic ligatures in vitro study . Three different colours (transparent, white and yellow) from three different companies were selected. The samples were divided into 9 experimental groups each group had 10 elastic ligatures from the same colour and the same company with control group (cells with no contact with elastomeric ligatures) , Also positive control group contain (Phosphate buffer saline) and negative control group contain (Tween 80) were used to verify the results of study.

Cell culture were used to test the cytotoxicity of these elastic ligature, The cell culture model used in the present study were the monolayer type. The cell lines were chicken embryo fibroblast and human lymphocyte of healthy person. These cells were exposed to specific media contain the extracted elutes of elastic ligatures after preserving it in this media for different times interval (1,2,3,7 and 28 days) .

Then the cell viability were measured by using the neutral red dye, the optical densities of living cells were measured by ELISA reader devise at wave length 490 nM. , The percentage of viable cells was obtained by comparing the mean optical density (OD) in the control group (cells with no contact with elastomeric ligatures) with that obtained from supernatants of cell cultures that had been in contact with elastomeric ligatures.

The results show that there were increase in the percent of viable cells from the first day of experiment till day 28 and there are highly significant difference between the control group and all the experimental groups at all the periods of experiment.

In conclusion there were significant difference among different manufactures, but there are statically non significant difference among different colours from the same manufacturer.