Article review

Is there any difference in the Force degradation pattern between memory type & ordinary type of six different of elastomeric chains?

[1]Athraa. A. Abass, [2]MakaremM.Abdullkareem, and [3]Lames H. Almanseekanaa
[1, 2]*Department of Prosthodontic, College of dentistry, University of Karbala, Iraq.*
[3] *Department of Basic medical sciences, College of Dentistry, Kerbala University, Iraq*

Article details:
Received: 29th April, 2019
Revision: Not Reqd.
Accepted: 15th May, 2019
Published: 25th May, 2019

Keywords: Health hazard, Kerbala University Iraq, Plastination technique, Hoffen polyester P45, polymers P35, P40, and P45, gross anatomy, cross-sectional anatomy, pathology, and radiology, plastinated of horse leg

ABSTRACT

A definition of the force to the moment percentage of approximately ten mm must applied to the posterior& the anterior teeth for obtaining a translating tooth movement.

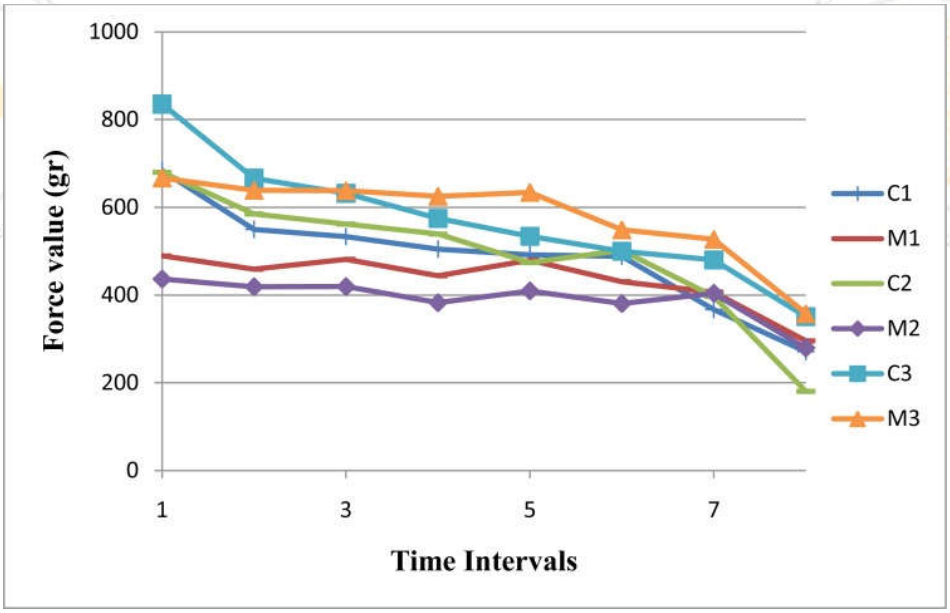
M.Atai, A. (2012). Force degradation pattern of the six differently orthodontic elastomeric chains. *Journal of Dentistry,* 9(4), pp. 204-215.

Tehran philosopher Mirhashemi et al attempted to define" the force degradation pattern" in his 2012 essay. During that time, through the prevalent systems for producing force, i.e. (Nickel Titanium coil springs (open &closed) and elastomeric products), the latter were more popular due to ease of application and low costy. In addition, they were comfortable for clinicians and patients. Although the author had some good points, his article had biased and contained some misinterpretation of data from others and methods of measuring force.

Mirhashemi et al included in this study two types of elastomeric chains (ordinary type& memory type). The mechanical properties; behavior and force decay of memory and ordinary type of elastomeric chains had differed significantly.

The ordinary elastomeric chains divided into two types according to tensile strength:
A. Regular ordinary elastomeric chains (e.g. maximum elastomeric chain).
B. Extreme ordinary elastomeric chains.
The latter type had the highest force level with less amount of damage over a period when had compared to the regular ordinary elastomeric chain and offered super stiffness qualities **(Ortho Technology Catalog, 2019).**
This should take in consideration in the clinical practice. Compared to the conventional type of elastomeric chains, memory type elastomeric chains had delivered a low force level at the first (100%)of the lengthening; whatever, their rate of force decay over four weeks were slowly. Although conventional and memory type elastomeric chains had followed a similar schematic pattern of each group but degradation of force pattern of conventional and memory type elastomeric chains had differed significantly, as shown in **figure (1) and table (1)**.
In order to obtain about (200) grof force with memory type elastomeric chains, they should be elongated to higher degrees in comparison to conventional types. Anyway, memory type elastomeric chains had more advantages and should been used widely in orthodontic practice. Although his advantages of this article, there some points from my point of view:

in the topic not included which type of elastomeric chain was used(closed; long and short), measurement of force by electronic force device; immersion of custom made device as in vitro study at which temperature since this will effect on elastomeric chains regarding the physical properties like PH; temperature; oral hygiene and fluoride release.



One of the most effects of elastomeric chain during applying force was releasing fluoride, which affected on the chemical structure of elastics. Thus, warning must take

in consideration including the frequency of patient visited and increasing the number of visits for giving the force when using these products during orthodontic treatment **(Elaides et al., 2001)**.

However, the mechanical properties of elastomeric chains had affected by (the rate of the force; time of loading the force and environmental factors (e.g. air; temperature; saliva and food)} **(Rock et al., 1985; Stevenson and Kusy, 1995)**.
Nevertheless, Mirhashemi work still provided the impetus for the uses of memory type instead of conventional type to maintain the force level in one plane and decrease time interval for the patient.
The force degradation patterns of memory and convential types of elastomeric chains. C(1): Ordinary l type elastomeric chain of American Orthodontics, C(2): Ordinary elastomeric chain of GAC, C(3): Ordinary elastomeric chain of Ortho Technology, M(1): Memory elastomeric chain of American orthodontics, M(2): Super elastomeric chain of GAC, M(3): Extreme elastomeric chain of Ortho Technology. In horizontal axis time intervals of (1–8) represents (0; 1;8; 24 and 72) hours and(1; 2 and 4 weeks), respectively (Mirhashemi et al; 2012)
Comparison between the first and the latest force readings for each elastomeric chains group based on Tukey's Test (Mirhashemi et al; 2012).

Table 1

	C(1)	C(2)	C(3)	M(1)	M(2)	M(3)
Different Mean (SE)between the first value and the final value (gr)	412.94 (15.5)*	499.2 (15.1)*	484.63 (46.9)*	193.8 (14.8)*	157.1 (10.2)*	309.1 (24.3)*

*Significance level of 5% ($p < 0.05$)

REFERENCES

[1] Mirhashemi AH, Saffarshahroudi A, Sodagar A. Atai M.. Force degradation pattern of six different elastomeric chain. 2012.
[2] Ortho Technology Company: Orthodontic catalog. 2019.
[3] Eliades T, Eliades G, Brantley W, Johnston TM. Orthodontic Materials: scientific and clinical aspects.2nd: Thieme, Stuttgart, Germany. 2001. P. 557-647, 77-82.
[4] Rock WP, Wilson HJ, Fisher SE. A laboratory investigation of orthodontic elastomeric chains. Br J Orthod. 1985; 12: 202-7.
[5] Stevenson JS, Kusy RP. Structural degradation of polyurethane based elastomeric modules. J of Mater Science- Materials in Medicine. 1995; 6: 377- 84.

[6] Evangelista MB, Berzins DW, Monaghan P. Effect of disinfecting solutions on the mechanical properties of orthodontic elastomeric ligatures. Angle Orthod.2007; 77(4):681–7. doi: 10.2319/052806-213.
[7] Teixeira L, Pereira Bdo R, Bortoly TG, Brancher JA, Tanaka OM, GuarizaFilho O. The environmental influence of Light Coke, phosphoric acid, and citric acid on elastomeric chains. J Contemp Dent Pract.2008; 9(7):17–24.
[8] Larrabee TM, Liu SS, Torres-Gorena A, Soto-Rojas A, Eckert GJ, Stewart KT. The effects of varying alcohol concentrations commonly found in mouth rinses on the force decay of elastomeric chain. Angle Orthod.2012; 82(5):894–9. doi: 10.2319/062211-407.1
[9] Pithon MM, Rodrigues AC, Sousa EL, Santos LP, SoaresNdos S. Do mouthwashes with and without bleaching agents degrade the force of elastomeric chains? Angle Orthod.2013; 83(4):712–7. doi: 10.2319/081012-646.1.