

CFAO Graduate Student Posterboard Abstracts

University of Manitoba

THE EFFECT OF CERTAIN DIETARY HABITS ON THE DISCOLORATION OF TOOTH-COLOURED BRACKETS – A PRELIMINARY STUDY

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Summary: Tooth-Coloured Brackets are expected to be both aesthetically and physically durable during the orthodontic treatment. Colour change determination may be precisely performed with spectrophotometers; however this technique is time consuming and requires special devices. In this study, the staining properties of six dietary products: tea, tomato juice, red wine, curry, coffee and coke were tested. CIELAB units, which when analysed mathematically, compares the colour parameters of different objects. This system consists of three coordinates L*, a* and b*. The L* refers to the lightness coordinate, and its value ranges from 0 for perfect black to 100 for perfect white, a* is a measure of redness or greenness, and b* is a measure of yellowness or blueness 10 different bracket types were tested (5 plastic, 5 ceramic). In total, 70 brackets were photographed digitally to obtain the baseline L*, a*, b* values. Each sample was immersed in test solutions for one week and the post-treatment images of the test materials were acquired. All L*, a*, b* values including the corrected values of these units were analyzed by a graphic software, and compared between the control and test brackets. Kruskal-Wallis test indicated a significant difference ($p < 0.05$) between the dietary products. Multiple comparisons with Mann-Whitney test indicated that in comparison to the control group (not treated with staining agents) the brackets treated with red wine had the most significant staining characteristics ($p < 0.05$ for all CIELAB units) followed by tea ($p < 0.05$ for a*, b*) and curry ($p < 0.05$ for b*) on the esthetic brackets.

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INFLUENCE OF A FLUORIDE MOUTHRINSE ON THE GALVANIC CORROSION OCCURRING BETWEEN NiTi OR CuNiTi WIRES AND ORTHODONTIC BRACKETS: INCIDENCE ON THE MECHANICAL PROPERTIES OF THE WIRES

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Aim: It has been reported that the use of fluoride prophylactic agents can cause galvanic corrosion of the titanium based alloys used in orthodontics. The purpose of the present study was to investigate the effects of a fluoride mouthrinse on the mechanical properties of nickel-titanium (NiTi) and copper–nickel-titanium (CuNiTi) orthodontic archwires that have been coupled with different types of orthodontic brackets (Smartclip, Clarity, and Sprint brackets).

Materials and Methods: 90 segments of NiTi and 90 segments of CuNiTi archwires were tested. Every segment was coupled with 2 brackets of each brand. The wire–bracket assembly obtained was incubated, at 37°C for three hours either in a solution of a commercially available mouthwash (Fluorinse™ 0,05% NaF), or in a solution of artificial saliva (control).

Following the incubation, the wires were separated from the brackets, rinsed, mounted on a stainless steel support and placed in a waterbath of artificial saliva at 37°C.

A 3-point bending test was made to calculate the loading and unloading elastic modulus and yield strength of the wires. Analysis of variance (ANOVA) and post hoc comparisons were made using Bonferroni's correction to identify the statistically significant differences ($\alpha = 0,05$).

Results: The use of a fluoridated mouthrinse reduced the loading and unloading elastic modulus and yield strength of the NiTi wires. This reduction, however, varies with the type of bracket that was coupled with the wire.

The mechanical properties of the CuNiTi wires were not modified by the use of the fluoride rinse or by the type of bracket to which they were coupled.

Conclusions: The use of a fluoride mouthrinse alters the mechanical properties of NiTi wires only. This effect varies with the type of bracket that was in contact with the wire. However our results do not allow us to conclude that the alteration of the mechanical properties of the wires would necessarily imply a prolongation of the orthodontic treatment time.

Keywords: Fluoride, nickel-titanium archwires, galvanic corrosion, mechanical properties.