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An evaluation of two types of nickel titanium wires in terms of micromorphology and nickel ions' release following oral environment exposure

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Background: This study aimed to compare superelastic and heat activated nickel titanium orthodontic wires surface morphology and potential release of nickel ions following exposure to oral environment conditions.

Methods: Twenty four 20 mm length distal cuts of superelastic (NiTi force 1) and Twenty four 20 mm length distal cuts of heat activated (Therma – Ti lite) nickel titanium wires (American orthodontics, Sheboygan, WL, USA) were divided into two equal groups: 12 wire segments passively exposed to oral environment for one month. Scanning Electron Microscopy were used to analyze surface morphology of the wires which were immersed in artificial saliva for one month to determine potential nickel ions' release by means of atomic absorption spectrophotometer.

Results: Heat activated nickel titanium (NiTi) was rougher than superelastic wires and both types of wires released almost the same amount of Ni ions. After clinical exposure more surface roughness was recorded for superelastic NiTi wires and heat activated NiTi wires. However, retrieved superelastic NiTi wires released less Ni ions in artificial saliva after clinical exposure and the same result was recorded regarding heat activated wires.

Conclusions: Both types of NiTi wires were obviously affected by oral environment conditions and their surface roughness significantly increased while the amount of the released Ni ions significantly declined.

Biography

Rabab Al-Sabbagh is currently working as a Professor in Hama University in Syria. She completed her PhD and Masters in Orthodontics in Cairo University, Cairo, Egypt. She published lots of research works and wrote number of books, organized several conferences and workshops, and supervised several masters & PhD students. She is interested in the area of orthodontics.

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