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Influence of cryogenic treatment on hardness of nickel-titanium alloy used for rotary endodontic instrument-An invitro study

T S Vinoth Kumar, D. Kandaswamy¹, G. Prabhakaran², A. Rajadurai³

Sri Ramachandra University, India

¹Sri Ramachandra University, India

²Velammal Engineering College, India

³Anna University, India

Cryogenic treatment is onetime supplementary thermal treatment where alloys are subjected to sub-zero temperature to improve their metallurgical properties. Nickel-Titanium alloy used for manufacturing of rotary endodontic instruments possess superelastic property due to which they must be machined rather than twisted. The combination of surface defects during manufacturing and lower hardness of the alloy results in compromised cutting efficiency of endodontic instruments within the root canals. A recent approach deals with the use of Nickel-Titanium alloy that possess a mixture of austenite and martensite phase at body temperature in order to have extreme flexibility without the conventional shape memory. The purpose of this study was to evaluate the effect of different cryogenic treatment parameters on the hardness of Nickel-Titanium alloy. Accordingly, a similar virgin alloy was procured in the form of sheets. 15 samples were prepared from the sheet using electrical discharge machining process. They were randomly divided into five groups (four experimental groups based on the soaking time and temperature parameters of cryogenic treatment and a control group; n=3). The metal samples in each experimental group were subjected to Vickers hardness testing following the cryogenic treatment and compared with that of the control group. The data were tabulated and the results were statistically analyzed using SPSS software.

Biography

T S Vinoth Kumar has completed his MDS from The Tamilnadu Dr. MGR Medical University. He is a Research Scholar in the Department of Conservative Dentistry and Endodontics, Faculty of Dental Sciences, Sri Ramachandra University. He has published National and International papers in reputed journals and has been serving as invited reviewer and Editorial Board member. He coined the term "Reverse Sandwich Restoration" in dentistry.

vinothkumar_ts@yahoo.com