Students' Practical training in endodontics: root canal shaping and NiTi rotary system.

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INTRODUCTION: The use of Rotary Nickel-Titanium systems for root canal preparation is taught during university studies. In our dental school this knowledge is dealt with after conventional hand instrumentation.
The aim of the present survey was to investigate root-canal shaping with manual and rotary Ni-Ti files performed by undergraduate students**.**

METHOD: For this survey, students beginning their third-year (D1), who had not received any information on endodontics, were chosen. They were randomly divided into two equal groups of thirty students: equality was determined using the reports of the past year practical tests in the prosthesis and restorative options.
A three-hour course on general endodontics was delivered to the two groups. Then each received specific training for 2 hours: on the rotary Ni-Ti files system for group1, and on a manual technique for group 2.

After this training, each student had to treat 4 teeth of increasing difficulty: first 2 single-root teeth and next 2 molars.
The dental crown was removed to make canal access easier. A pre-operative X-ray and a technical card were provided for each tooth. The card mentioned which canal was to be treated, its working ledge and the recommended operative sequence.
In group 1 (using rotary files) students used the HEROShaper® system: one difficult sequence for curved canals 6% ∅20, 4% ∅20, 4% ∅25, 4% ∅30 and a medium one for straight canals: 6% ∅25, 4% ∅25, 4% ∅30.
Group 2 used a set of HELIFILE® files (sizes 15/100 to 35/100).

Four specifically trained examiners observed the post-operative X-ray and each apical foramen with a microscope (X 16). Afterwards, a size 15 K-type file was introduced into each root canal to establish patency. The parameters noted were instrumental fracture visible on X-ray, lost operative length, canal ledge and dentinal plug, over-instrumentation and apical zips.

The data were analyzed statistically using analysis of variance and fisher's PLSD test (all the statistical tests were interpreted at the α=5% significance level) performed by the Statview system (Brain-Power Inc. Agoura Hills, CA, USA).

RESULTS :

Group	Canals	Fracture	Lost length	Over shaping	Zips
NiTi	**104**	**8**	**11**	**34**	**21,2**
Manual	**104**	**0**	**13**	**28,3**	**14,2**
		ns	ns	ns	ns

All the parameters appeared in both groups without statistically significant differences.
Instrumental fracture occurred only in the rotative group (2).

DISCUSSION & CONCLUSION:
The students involved in this survey had received limited training. Thorough initial knowledge should lead to better results, in particular knowledge of the correct technique for the rotary Ni-Ti system, and for applying light apical pressure.
There is a national consensus on the need for teaching undergraduates about rotary Ni-Ti systems in France[3].
Prior experience with a hand preparation technique was not reflected in improved quality of the subsequent rotary preparation. Rotary Nickel Titanium files for root canal shaping could be taught earlier in the D1.

REFERENCES:[1]Sonntag D, Delschen S, Stachniss V.Int Endod J. 2003 Nov; 36(11):715-23. [2]Peru M, Peru F, Manocci F, Sherriff M, Buchanan LS and Ford TR. Eur J Dent Educ. 2006 Feb;10(1):52-9. [3]Arbab-Chirani R, Vulcain JM. Int Endod J. 2004 May; 37(5):320-4.