

EFFECT OF DIFFERENT ROTATIONAL SPEEDS OF LIGHTSPEED INSTRUMENTS ON CANAL MORPHOLOGY

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ABSTRACT

The aim of the present study was to assess LightSpeed instrumentation behavior in apical canal preparation using two rotational speeds; 750 and 2000 r.p.m. Fifty single rooted teeth with 20-30° apical curvatures were prepared using LightSpeed instruments of sizes 20 through 47.5. Roots were sectioned at 2, 4, and 6 mm from their apices, the cross root sections were photographed at a standard magnification and distance before preparation. Teeth were reassembled using a specially designed muffle. Then, they were divided into two groups after which root canal preparation was done. Group I was prepared at 750 r.p.m. while group II at 2000 r.p.m. Pre and post instrumentation photographs were superimposed and subjected to image computer analysis "Image J Program". Measured parameters were pre and post instrumentation canal area and displacement distance. Results showed generally a gradual increase in canal area coronal wards. A slight increase in canal area was found in the 750 r.p.m. group as compared to the 2000 r.p.m one at 4 and 6 mm levels. However, this difference was found to be statistically insignificant. Canal preparation remained relatively centralized where a statistically insignificant canal center displacement was found at both preparation speeds. We can conclude that LightSpeed instruments produced a centralized preparation with minimal canal transportation and with no significant effect of rotational preparation speed variation on canal area and centering ability.

INTRODUCTION :

Biomechanical preparation is the most important factor in the success of endodontic treatment. Instrumentation objectives include debriding the root canal system, maintaining the apical foramen in its original position, keeping the apical foramen as small as practical, and developing a continuously tapering conical form.

New generation of root canal instruments were introduced when nickel titanium instruments were

marked. Walia et al.⁽¹⁾ were the first to introduce this alloy to endodontic armamentarium. Nickel titanium (NiTi) alloy is known to have many advantages as shape memory, super elasticity, low modulus of elasticity, superior flexibility, superior resistance to torsional fracture, high corrosion resistance and excellent biocompatibility.

Recent advances in technology facilitated the use of NiTi instruments as engine driven. Since then a plenty of instruments were designed and

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