Cyclic fatigue of instruments for endodontic glide path

Abstrak

Endodontic glide path is the creation of a smooth patency from canal orifice to apex, which can be performed manually or with small tapered NiTi rotary instruments. The use of stainless steel (SS) hand K-files inserted in a reciprocating handpiece can be a possible alternative to create a mechanical glide path. The aim of this study was to compare the cyclic fatigue resistance between SS K-files used in a reciprocating motion and NiTi rotary instruments in artificial curved canals. Ten SS size 15 K-files used with the M4 handpiece (SybronEndo, Glendora, CA, USA) and ten PathFiles (Maillefer-Dentsply, Ballaigues, CH, Switzerland) NiTi rotary instruments size 16, 0.02 taper were tested for resistance to cyclic fatigue. The time to fracture inside an artificial curved canal was recorded for each instrument. Data were analyzed by one-way ANOVA and Tukey HSD test. Mean time (and SD) to failure was 464 s (±40.4) for the Group PF (NiTi rotary PathFile), and 1049 s (±24.8) for the Group M4 (SS K-files reciprocating) with a statistically significant difference between the two groups ($p = 0.033$). The SS 15 K-files used with the M4 handpiece showed a significant greater resistance to cyclic fatigue when compared to the NiTi rotary PathFiles. Therefore, the use of small size SS files in a reciprocating motion might be a rational choice for the creation of a mechanical endodontic glide path in curved root canals.