Objectives

To compare the influence of the amount of in vivo shaped root canals (RC) in static cyclic fatigue (CF) resistance in ProTaper Universal (PTU) S1 instruments at different points of curvature.

Materials and Methods

A total of 80 files PTU S1 were divided in four groups of 20 instruments each: control group 0 (unused files), group 1 (files used to shape up to 10 RC), group 2 (files used in 11-15 RC) and group 3 (files used in more than 15 RC). The same endodontist with more than 15 years of experience in rotary canal instrumentation shaped all RC using always the same protocol (PTU S1 was used to working length after the achievement of a reproducible glide path with a #15 hand file. 5,25% NaOCl solution was used for irrigation). CF resistance was tested in stainless-steel curved canals (60°, r=3mm). All instruments were rotated at 300rpm until fracture at 5mm and at 10 mm from the tip, making a total of 8 subgroups (0-5, 0-10, 1-5, 1-10, 2-5, 2-10, 3-5, 3-10). Time to fracture was recorded. Mean half-life, Beta and Eta were calculated for each group and were compared with Weibull analysis.

Results

PTU S1 instruments will last significantly longer at 5 than at 10 mm with a 100% probability independently of the number of shaped RC, however there were not significant differences in CF resistance among the four groups (unused instruments or files used to shape different number of RC), neither at 5 nor at 10 mm.

Conclusions

PTU S1 was significantly more resistant at 5 than at 10 mm from the tip. The increase in the number of RC shaped with the same instrument did not decrease CF resistance of the instrument.

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TITLE: In vitro comparison of the antimicrobial effect of Tri-antibiotic paste components, amoxicillin and clavulanic acid against *Fusobacterium nucleatum* and *Actinomyces naeslundii*

AUTHORS: Prieto González L, González Nieto A, Martínez Pinar A, Basel Sawas Jiménez M, Rubio Flores D, García Barbero E.

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Objectives

To compare the effectiveness of Tri-antibiotic Paste components (Minocycline / metronidazole / ciprofloxacin), amoxicillin and clavulanic acid against two endodontic pathogens, *Fusobacterium nucleatum* and *Actinomyces naeslundii*.

Materials and Methods

It was determined the minimum inhibitory concentration (MIC) of minocycline, metronidazole, ciprofloxacin, amoxicillin and clavulanic acid by microdilution assay in 96-well Mueller- Hinton agar plates according to EUCAST. We seeded 50 µl of standard bacterial suspension (corresponding to 0.5 of the McFarland scale), with 50 µl of antibiotic solution in a concentration gradient. Under spectrophotometry, we calculated the optical density (OD 600) to determine the lowest concentration (µg / ml) that inhibit the visible growth of the microorganisms after overnight incubation (MIC). Statistical analysis was carried out by one way ANOVA and post- hoc Duncan test at a level of significance of p<0,05.

Results

For *Fusobacterium Nucleatum*, no significant differences were found for amoxicillin, metronidazole and minocycline. Nevertheless, ciprofloxacin resulted in higher MIC value than the others, indicating its lower antibacterial activity.

For *Actinomyces naeslundii* colonies, no differences were found between amoxicillin and minocycline. Ciprofloxacin and metronidazole showed higher MIC values in a significant manner.

for both bacteria, the values obtained from the clavulanic acid can be translated in terms of bacterial resistance.

Conclusions

No significant differences were found for inhibiting bacterial colonies with amoxicillin or Tri-antibiotic paste components, needing higher concentrations to inhibit the growth of ciprofloxacin with *Fusobacterium nucleatum*, and metronidazole and ciprofloxacin with *Actinomyces naeslundii*.

By itself, clavulanic acid is not able to inhibit the growth of both bacteria studied.

In view of the results of this study, it seems appropriate to analyse the effectiveness of Tri-antibiotic paste components combined with amoxicillin and the combination of amoxicillin with clavulanic acid.