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The Benefits Of Using Low Accelerating Voltage To Assess Endodontic Instruments By Scanning Electron Microscopy

Abstract

Scanning electron microscopy is often used to evaluate surface contamination and machining defects in dental and other medical instruments. Knowledge of the operating conditions of the SEM, in particular the accelerating voltage, is essential to properly interpret images of such material. We demonstrate the importance of using low accelerating voltages to detect surface features including contamination on NiTi rotary and hand files, and conclude that even recent studies may have significantly underestimated the amount of non-metallic debris (from the manufacturing process or from biological contamination) present on the surface of such instruments.

Case Report

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Unusual Maxillary Lateral Incisors: Case Reports

Abstract

Root canal morphology is often complex and the number of root canals may vary for any type of tooth. Abnormalities in the root canal morphology of maxillary lateral incisors are rare. Maxillary lateral incisors can have two root canals, even though the dental literature supports their 100% single-canal anatomy. It is vital to consider the possibility of extra root canal(s), even in teeth with a low frequency of abnormal root canal anatomy. This report presents two cases of maxillary lateral incisors with two root canals.

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Evaluation Of The Antimicrobial Effect Of Er:YAG Laser Irradiation Versus 1% Sodium Hypochlorite Irrigation For Root Canal Disinfection

Abstract

This laboratory study evaluated Er:YAG laser antibacterial action in infected root canals. Forty-eight maxillary central incisors were used. After canal preparation, the teeth were autoclaved and divided into four groups: (1) non-treated teeth (control group); (2) teeth treated with NaOCl; (3) teeth irradiated with Er:YAG laser (7 Hz, 100 mJ, 80 pulses/canal, 11 sec) to the working length; (4) teeth irradiated similarly to, but 3 mm short, of the apex. The root canals from Groups 2, 3 and 4 were inoculated with 4 bacteria: *Bacillus subtilis*, *Enterococcus faecalis*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*, together with *Candida albicans*, and maintained for 24 h at 37°C. All suspensions were adjusted to tube 2 of the MacFarland scale. The intracanal material was then collected with sterile paper points, which were placed in the canals for 5 min and then immersed in 5 ml of BHI medium. This was then seeded onto agar and stained by Gram's method. The NaOCl solutions and the Er:YAG laser irradiation to working length were effective against all five micro-organisms; however, 70% of the specimens irradiated 3 mm short of the apex remained infected.

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The Influence Of Filling Technique On Depth Of Tubule Penetration By Root Canal Sealer: A Study Using Light Microscopy And Digital Image Processing

Abstract

The purpose of this study was to compare the depth of sealer penetration into dentinal tubules by three root-filling techniques using light microscopy and digital image processing. Thirty-two maxillary central incisors were prepared. Two teeth were separated for the control group. The rest were divided into three equal groups and obturated as following – G1: lateral condensation; G2: warm vertical compaction of gutta-percha and G3: Thermafil system. Each sample was sectioned longitudinally and prepared for microscopic analysis. A sequence of photomicrographs with magnifications of X50, X200 and X500 were taken. Through digital image analysis and processing, measurements for each field were obtained. A non-parametric ANOVA Kruskal-Wallis analysis was used to determine whether there were significant differences among the groups. Significant differences between G2 and G1 ($p = 0.034$) and between G3 and G1 ($p = 0.021$) were identified. There were no significant differences between G2 and G3 ($p > 0.05$). The results of this research suggest that samples root-filled by thermoplasticised gutta-percha techniques lead to deeper penetration of the root canal sealer into the dentinal tubules.