Original Research

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A Comparison Of Tissue Reaction To MTA And An Experimental Root-End Restorative Material In Rats

Abstract

The purpose of this study was to compare the biocompatibility of a new experimental root-end filling material, "Cold Ceramic" (CC), with mineral trioxide aggregate (MTA) in rats. After anaesthetising 10 rats and raising tissue flaps, tablets of the material were placed subcutaneously. Five rats were followed for seven days and five for 30 days. An incision without any implanted material was used as a control. Histological analyses were performed with regard to number, type and location of the inflammatory cells and type of surrounding tissue. Kruskal-Wallis and Mann-Whitney statistical tests were used. Comparing inflammatory reactions between the two experimental groups (MTA and CC) and the control group showed significant differences after seven days ($p = 0.031$). There were no significant differences between CC and MTA groups after seven days ($p = 0.222$) and after 30 days ($p = 0.063$). The results suggested that MTA and CC are both biocompatible. It appears that MTA induces less inflammatory response in short periods of observation, but CC may be more biocompatible for slightly longer periods. The results of the study suggest that MTA and CC are both well tolerated. Investigations are necessary to determine the effect of CC after implantation into bone.

Original Research

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An Energy-Dispersive X-ray Analysis And SEM Study Of Debris Remaining On Endodontic Instruments After Ultrasonic Cleaning And Autoclave Sterilization

Abstract

This study was carried out to investigate metallic and non-metallic debris remaining on endodontic files after ultrasonic cleaning and autoclave processing. Forty-eight unused rotary and hand endodontic files, including eight different brands, were tested. Instruments were cleaned with ultrasound, autoclaved and before and after each step were observed by scanning electron microscopy (SEM). Adherent debris was analysed by energy-dispersive X-ray analysis (EDXA). All of the instruments before ultrasound cleaning were contaminated with metallic and non-metallic debris. Although most non-metallic debris was removed by ultrasonic cleaning, most of the metallic debris remained even after the final step of sterilization.

Review Article

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Chlorhexidine Gluconate

This article is based on a presentation to the Fourth Transpacific Endodontic Conference, Port Douglas, September 2004.

Abstract

The aim of root canal treatment is to eliminate bacteria from the infected root canal and to prevent reinfection. Biomechanical cleaning and shaping greatly reduces the number of bacteria. Nevertheless, due to anatomical complexity of the root canal system, residues and bacteria cannot be removed completely. Therefore, various substances have been used during canal preparation to remove debris, necrotic tissue, bacteria and smear layer. The most common irrigant of choice is sodium hypochlorite (NaOCl): it is an effective antimicrobial agent and tissue solvent. However, NaOCl can be toxic. Chlorhexidine gluconate (CHX) is a broad-spectrum antimicrobial agent. As a root canal irrigant and intracanal medicament, CHX has an antibacterial efficacy comparable to that of NaOCl, and is effective against resistant bacterial strains. CHX may result in residual antimicrobial activity of the dentine surface after prolonged exposure of the root canal to CHX. CHX also has a low grade of toxicity. In this review CHX will be discussed in detail.

Original Research

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Comparison Of The Root-end Sealing Ability Of MTA And Portland Cement

Abstract

The aim of this study was to compare the *in vitro* sealing ability of ProRoot MTA, ProRoot MTA (Tooth-Coloured Formula), ordinary Portland cement and white Portland cement when used as root-end filling materials. Twenty-four single-rooted human premolars were prepared and obturated using standard techniques, then retrofilled with the test materials. The prepared teeth were immersed in 1% methylene blue dye for 72 hours and then assessed for dye leakage. The depth of dye penetration was measured and expressed as a percentage of the length of the retrofilling. Data was analysed using ANOVA and Fisher's Least Significant Test (LSD) ($p < 0.05$). None of the teeth in any of the test groups showed leakage beyond the retrofillings. Given the low cost and apparently similar sealing ability of the cements, it is reasonable to consider Portland cement as a possible substitute for MTA as a root-end filling material. However, further tests, especially *in vivo* biocompatibility tests, need to be conducted before Portland cement can be recommended for clinical use.

Original Research

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In vitro Evaluation Of Three Techniques To Obturate 0.06 Taper Canal Preparations

Abstract

The aim of this study was to evaluate the ability of three obturation methods to seal root canals prepared using 0.06 taper rotary instruments. Forty-five extracted human single-rooted teeth were instrumented with 0.06 taper Profile nickel-titanium rotary files and randomly divided into three experimental groups containing 15 teeth each. The first group was obturated using the System B technique with 0.06 taper standardised gutta-percha points, the second group was obturated using the System B technique with non-standardised MF gutta-percha points, the third group was obturated by cold lateral condensation technique using standardised 0.02 taper master gutta-percha points. Apical leakage of the roots was evaluated by dye penetration using a stereomicroscope after sectioning the roots. The group obturated using System B and 0.06 taper gutta-percha points showed the least dye penetration. However, the difference in the linear extent of dye penetration was not statistically significant.

Case Report

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Maxillary Second Premolar With Three Roots And Three Separate Root Canals – Case Reports

Abstract

Aberrations in root canal systems are a commonly occurring phenomenon. Knowledge of the basic root canal anatomy and its variation is necessary for successful completion of endodontics. Maxillary second premolars usually have one root and one canal. The occurrence of these teeth having three roots and three canals is very rare. Three such cases of maxillary second premolar with three roots and three canals are presented here.

Original Research

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The Influence Of Smear Layer On Coronal Leakage Of Roth 801 And AH26 Root Canal Sealers

Abstract

The aim of this *in vitro* study was to examine the effect of removal of smear layer on the coronal seal of two commonly used root canal sealers: Roth 801, a zinc oxide-eugenol-based sealer and AH26, an epoxy resin-based sealer. Ninety-six single-rooted human teeth were used. The teeth were instrumented and assigned to four experimental groups of 20 teeth each, with 10 teeth as controls and the remaining six teeth examined under a scanning electron microscope.

The teeth in the experimental groups (80 teeth) were divided into four sub-groups and were obturated by laterally condensed gutta-percha with the two sealer cements as follows: Group A1: smear layer left intact and AH26 cement used as sealer; Group A2: smear layer left intact and Roth 801 cement used as sealer; Group B1: smear layer removed and AH26 cement used as sealer; and Group B2: smear layer removed and Roth 801 cement used as sealer.

Coronal microleakage was evaluated by measuring the distance of dye penetration. The data was statistically evaluated using a two-way ANOVA test.

The results showed that removal of the smear layer resulted in a statistically significant reduction of microleakage values in the groups obturated with AH26 compared with the groups obturated with Roth 801 sealer. It was concluded that the removal of smear layer has a significant influence on the degree of microleakage in obturated root canals.

Case Report

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Treatment Of Invasive Cervical Resorption With MTA: Case Report

Abstract

This paper presents a case report of a maxillary lateral incisor affected by invasive cervical resorption. The tooth was submitted to a 21-day treatment with calcium hydroxide followed by root canal filling. The area of resorption was sealed with MTA followed by glass ionomer cement and restored with composite resin. Two-year radiographic follow-up showed stability of the resorption site and normal coronal colour and depth of gingival sulcus.