

PR1

Effect of Using Different Single-File Root Canal Preparation Systems on Microbial Count And Post-Operative Pain

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ABSTRACT

Objectives: Clinical evaluation of microbial count following root canal preparation using different single file systems. Clinical evaluation of the post-operative pain following root canal preparation using different single file systems. Comparison between the effect of different single file systems on microbial count and post-operative pain after root canal preparation.

Methods: Thirty patients aged from 20 to 40 years requiring routine root canal treatment of single-rooted tooth with single root canal were selected for this study. Cases were randomly divided into three equal groups (n=10) according to the root canal preparation system, Group 1: Hyflex EDM, Group 2: XP-endo Shaper, Group 3: Primary WaveOne Gold. Samples were taken for culture before and after preparation to detect bacterial count. Root canal treatment was carried out in a single visit and the severity of post-operative pain was evaluated using visual analog scale (VAS) at 24, 72 hours, and 7 days after treatment.

Results: All instrumentation systems significantly reduced the intracanal bacterial population after root canal preparation ($P < 0.001^*$). Instrumentation with XP-endo Shaper resulted in significantly greater bacterial reduction than those with Hyflex EDM and WaveOne Gold ($P < 0.001^*$). The incidence of post-operative pain was higher in the XP-endo Shaper compared with those in Hyflex EDM and WaveOne Gold ($P = 0.329$).

Conclusions: All instrumentation systems significantly reduced the number of bacteria but failed to render all root canals free of bacteria. There were no significant differences in the postoperative pain reported between the three groups.

PR2

Effectiveness of Various Irrigants With or Without Activation on Radicular Dentin Microhardness: An in-Vitro Study

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ABSTRACT

Objectives: This in-vitro study was done to comparatively evaluate the effect of Etidronic acid (HEBP), Sodium hypochlorite (NaOCl), and Ethylene Diamine Tetraacetic Acid (EDTA), with or without passive ultrasonic irrigation (PUI) on dentin microhardness. The null hypothesis was the absence of significant differences between the tested irrigants.

Methods: Eighty extracted human single rooted mandibular premolars were selected. Standardized root samples were obtained by sectioning the teeth horizontally at 8 mm from the apex. Root canals were prepared using Hyflex CM rotary files and cleaned with 2.5% NaOCl irrigation. Samples were divided randomly into 4 groups (n=20) according to the final rinse used (saline, 2.5% NaOCl, 17% EDTA or 18% HEBP). Each group was subdivided into 2 subgroups (n=10) according to the usage of PUI (with or without). Dentine microhardness was measured by Vickers microhardness tester before and after the final rinse at 100 and 500 μm from pulpal lumen, then the difference was calculated. Statistical analysis was done using ANOVA, t-test, and Tukey's post hoc test ($P \leq 0.05$).

Results: All tested irrigants except saline decreased the microhardness significantly ($P < 0.05$) at 100 and 500 μm . EDTA produced the highest significant reduction at 100 μm . While at 500 μm , EDTA and HEBP produced the highest reduction ($P < 0.001$) followed by NaOCl. Microhardness reduction at 100 μm was significantly higher than that at 500 μm . Subgroups with PUI showed a non-significant greater microhardness reduction than those without at both measuring points ($P > 0.05$).

Conclusions: 17% EDTA is a stronger dentine chelator than 18% HEBP whether associated with PUI or not. PUI has no significant effect on dentin microhardness.

PR3

Regenerative Endodontic Procedures For The Treatment of Necrotic Mature Teeth: A Preliminary Randomized Clinical Trial

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ABSTRACT

Objectives: This preliminary randomized, controlled trial aimed to compare the clinical and radiographic outcomes of two regenerative endodontic procedures (REPs), revitalization and a platelet-rich fibrin (PRF)-based technique, in the treatment of mature permanent teeth with necrotic pulps.

Methods: The study protocol was registered at the clinical trial registry (ClinicalTrials.gov) with identifier number NCT04158232. Twenty patients with mature necrotic anterior teeth with large periapical lesions were randomly allocated into two groups (n = 10): group I, treated with revitalization with the blood clot (BC) technique and group II, treated with a PRF-based technique. The follow-up was for 12 months. Periradicular healing was assessed using standardized radiographs taken at baseline, and at 6 and 12 months after treatment. An electric pulp tester was used to assess whether pulp sensibility had been regained during the follow-up period. Statistical analysis was conducted using Mann-Whitney test and Wilcoxon test for non-parametric data. For parametric data, repeated measures analysis of variance was used. The significance level was set at $p \leq .05$.

Results: There was a significant increase in periradicular healing in both groups at 6 and 12 months, compared to that at baseline, with no significant difference between the studied groups after 12 months ($p = .143$). There was a significant difference between the tooth sensibility readings at baseline, 6-month and 12-month follow-up timepoints ($p < .001$).

Conclusions: The findings of this preliminary trial indicate the potential for using REPs, such as revitalization or PRF-based techniques, as treatment options for mature teeth with necrotic pulps.

PR4

Efficacy of Different Chelating Agents in Smear Layer Removal

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ABSTRACT

Objectives: To assess the ability of 17% ethylene diamine tetra acetic acid (EDTA), 10% citric acid, 2.25% peracetic acid (PAA) and 1% phytic acid (IP6) in removing smear layer from root canal system using scanning electron microscopic analysis (SEM).

Methods: Forty single canal human mandibular premolars with nearly straight mature roots were used. Teeth were decoronated perpendicular to their long axes leaving roots approximately (13±1mm). Mechanical preparation was done using ProTaper instrument up to F4 master apical file with irrigation of 2.5% NaOCl. Depending on the final irrigant, the samples were divided randomly into four experimental groups Group I: 17% EDTA Group II: 10% citric acid. Group III: 2.25% PAA Group IV: 1% phytic acid. The experimental time period was 1 minute. These samples were observed by SEM for the absence or presence of smear layer in the coronal, middle, and apical thirds of the root canal. The data were statistically analyzed by Kruskal-Wallis Test and Mann-Whitney Test.

Results: In intergroup comparison, there was no statistically significant difference among the four groups. In intragroup comparison, there was no statistically significant difference between coronal and middle thirds. However, there were statistically significant differences between apical third versus both coronal and middle thirds in all tested groups.

Conclusions: The four tested final irrigation solutions can effectively remove the smear layer from the coronal and middle root canal thirds but they did not completely remove the smear layer at the apical one third.

PR5

Cytotoxicity of Three Root Canal Sealers with Different Bases on Human Dental Pulp Stem Cells Using MTT Assay

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ABSTRACT

Objectives: Cytotoxicity of three root canal sealers with different bases on human dental pulp stem cells using MTT assay.

Methods: Root canal sealers used in this study were Well Root St, GuttaFlow Bioseal and AH Plus. Human dental pulp stem cells were isolated from freshly extracted maxillary premolars by collagenase enzyme and cultured. Sealers were tested through time, after 1, 4 and 7 days. Cell proliferation of human dental pulp stem cells were determined using MTT assay. Cells without treatment with sealer extracts were used as a control. Level of absorption was measured by Eliza spectrophotometer.

Results: Human dental pulp stem cells showed a single morphological and phenotypic characteristic during the 2nd passage (P2), most of the cells had fibroblast morphology. After one day, there was no significant difference between the four groups. After 4 days and 7 days, there was a significant difference in mean percentage of cell proliferation between groups. After 4 days and 7 days, the highest mean percentage of cell proliferation was noted with control group, followed by GuttaFlow Bioseal group, then Well Root St group, and the lowest mean percentage was noted with AH plus group. For all sealers groups, the highest mean percentage of cell proliferation was noted with one day, followed by 4 days, and the lowest mean percentage was noted with 7 days.

Conclusions: GuttaFlow Bioseal was the least cytotoxic while AH Plus was the most.

PR6

Biocompatibility of Three Different Root Canal Sealers

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ABSTRACT

Objectives: To evaluate the biocompatibility of three different root canal sealers through implantation in subcutaneous tissues of rats.

Methods: Fifty-five male rats were distributed into three groups each received a subcutaneous dorsal implant of polyethylene tubes filled with (Well Root St, GuttaFlow Bioseal and AH Plus). The control group had ten rats received empty tubes. After the 7th, 15th, and 30th days, tissues were collected, fixed and processed for histologic evaluation. CD3 and CD68 markers were used for detection of lymphocytes and macrophages respectively then the slides were imaged and analyzed digitally.

Results: H&E staining showed that all groups exhibited an inflammatory response with formation of a fibrous capsule after 7 days, the inflammatory response and the thickness of fibrous capsule decreased after 30 days. CD3 staining showed that after 7 and 15 days, the highest mean percentage of lymphocytes infiltration was noted with AH Plus, followed by Well Root St, then GuttaFlow Bioseal. After 30 days, there was no significant difference in mean percentage of lymphocytes infiltration between groups. After 7, 15, and 30 days CD68 staining showed a significant difference in mean percentage of macrophages infiltration between groups. The highest mean percentage of macrophages infiltration was noted with AH plus group, followed by Well Root St group, then GuttaFlow Bioseal group, and the lowest mean percentage was noted with control group.

Conclusions: GuttaFlow Bioseal and Well Root St were biocompatible in comparison to AH Plus as root canal sealers.

PR7

1% Phytic Acid For Smear Layer Removal After Root Canal Preparation with Three Different Rotary Systems

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ABSTRACT

Objectives: This study compared smear layer removal by 1% phytic acid and 17% ethylenediamine-tetraacetic acid (EDTA) after root canal preparation with Smarttrack X3, Endo*star E, and ProTaper Gold rotary systems using environmental scanning electron microscope (ESEM).

Methods: Sixty single rooted unidentified extracted maxillary anterior human teeth were selected. The length of all the teeth used was adjusted at 16mm from the apex. Modified access cavities were done. Roots were randomly and equally divided into 3 main groups (n=20) according to rotary systems used: group A1; Smarttrack X3, group A2; Endo*star E3, and group A3; ProTaper Gold. Each group was further subdivided into 2 equal subgroups (n=10) according to the chelating agents used as a final rinse: subgroup B1; 1% Phytic acid, and subgroup B2; 17% EDTA. Roots were sectioned in buccolingual direction into 2 equal halves then examined under ESEM at the cervical, middle and apical thirds for presence or absence of smear layer.

Results: 1%phytic acid and 17% EDTA were evenly effective for smear layer removal. Smear layer removal and opened dentinal tubules were more recorded at the coronal third than at the apical third for all rotary systems.

Conclusions: 1% phytic acid was as effective as and not different from 17% EDTA in removing smear layer form root canals after instrumentation using Smarttrack X3, Endo*star E3 or ProTaper Gold rotary systems.

PR8

Bacterial Reduction of Mature *Enterococcus Faecalis* Biofilm by Different Irrigants and Activation Techniques Using Confocal Laser Scanning Microscopy

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ABSTRACT

Objectives: The aim of this study was to evaluate the effect of ultrasonic and sonic activation using three irrigants on mature *Enterococcus faecalis* biofilm.

Methods: Seventy singlerooted premolars were prepared and sterilized. Mature *E. faecalis* biofilm was developed. Roots were randomly divided into three groups ($n = 21$) according to activation technique: ultrasonic, sonic, and positive control. Each group was further subdivided into three subgroups ($n = 7$) according to the irrigant used: 4% propolis, 2% chlorhexidine (CHX), and 2.5% sodium hypochlorite. Samples were cut and scanned using cone focal laser scanning microscopy. The fluorescent images were analyzed using Zen imaging software. Statistical Analysis Used: Data analysis was performed using one-way analysis of variance and Tukey's honestly significant difference test for pairwise comparison. Statistical significance was set at 5%.

Results: Both activated groups showed a statistically significant bacterial reduction ($P \leq .001$). CHX showed the highest antibacterial effect.

Conclusions: Irrigant activation is an essential step in reduction of bacterial counts. CHX has a potent antibacterial effect against mature *E. faecalis* biofilm.

PR9

Evaluation of Dental Pulp Stem Cells Behavior After Induction by Three Different Bioactive Materials Using Two Different Scaffolds

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ABSTRACT

Objectives: To investigate the odontogenic effect of the glass-incorporated light-curable bioactive material Activa Bioactive in comparison to Theracal LC and the most widely used bioactive material Mineral trioxide aggregate (MTA) when combined with the effect of two different types of scaffolds.

Methods: The first scaffold is a composite of Polycaprolactone, nano chitosan and synthetic hydroxyapatite and the other type of scaffolds composed of Polycaprolactone, nano chitosan and synthetic Mg-substituted hydroxyapatite on dental pulp stem cells DPSCs isolated from freshly extracted premolars from young orthodontic patients to find which material and scaffold can induce the odontogenic differentiation of the cultured DPSCs more profoundly using gene expression analysis of Dentin Sialo Phospho Protein DSPP by quantitative real-time polymerase chain reaction, the data was analyzed statistically.

Results: This study strongly evidenced higher odontogenic differentiation effect of Mg HA polycaprolactone nano chitosan on the DPSCs than the other type of scaffold which did not contain Mg. The study also revealed significantly higher odontogenic differentiation effect of MTA on the cultured DPSCs than Activa bio active and Theracal LC. The combination between the scaffolds and the bioactive materials positively affected the induction of the DPSCs into odontoblasts like cells.

Conclusions: Polycaprolactone nano chitosan Mg-substituted HA scaffold has better odontogenic differentiation effect on the cultured DPSCs. MTA is the best bioactive material to induce the odontogenic differentiation of the cultured DPSCs when compared with Activa bioactive material and Theracal LC.

PR10

Effects of Autologous Dental Pulp Stem Cells And Mineral Trioxide Aggregate on Dogs' Dental Pulp

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ABSTRACT

Objectives: This study evaluated dogs' dental pulp response after direct capping with autologous dental pulp stem cells (DPSCs) and compared the results with MTA (Angelus, Brazil). After two different time intervals (6 and 12 weeks) through histological examination and immunohistochemical detection of TGF- β 1 in the pulp tissue.

Methods: Sixty teeth from six mongrel dogs were included (n=60), divided into four groups; negative control (n=12), positive control (n=12), MTA (n=24), and DPSCs (n=24). DPSCs were isolated and cultured from extracted first premolars (1pre-molar/dog). Class V cavities were prepared, the pulp exposed and treated according to each group. The cavities were restored with Riva Self Cure (SDI, Australia). After six and twelve weeks, the dogs were euthanized by an overdose of anesthesia. The teeth were prepared for histological and immunohistochemical analyses. Statistical analysis was calculated using One and Two-way ANOVA tests, $P \leq 0.05$.

Results: MTA induced the formation of an almost complete calcific bridge. DPSCs successfully regenerated the injured pulp and dentin. The comparison between the capping groups and time intervals had a statistically significant effect, as well as, the interaction between the two variables.

Conclusions: DPSCs had greater ability in the reparative and regenerative process of dentin and odontoblastic differentiation by having a significantly stronger TGF β 1 expression than MTA.

PR11

Depth and Percentage of Penetration of Sure Seal Root and AH Plus Sealers Into Dentinal Tubules with Two Different Obturation Techniques

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ABSTRACT

Objectives: To evaluate and compare depth and percentage of penetration of Sure Seal Root sealer and AH Plus sealer into dentinal tubules with cold lateral condensation (CLC) and single cone (SC) obturation techniques.

Methods: Human freshly extracted 40 maxillary anterior teeth were prepared and assigned to 4 experimental groups (n =10), designated as group I: (AH Plus + CLC), group II: (AH Plus + SC), group III: (Sure Seal Root + CLC) and group IV: (Sure Seal Root +SC). Teeth were sectioned at three root canal levels (coronal, middle, and apical) and examined by confocal laser scanning microscopy. Then, the depth of sealer penetration in dentinal tubules and percentages of the penetrated sealer into dentinal tubules in each section were measured. Data were analyzed using one-way ANOVA in a level of confidence at 95% followed by post hoc tukey test for comparisons.

Results: Group III showed significantly higher penetration depth at all levels than the other groups. The percentage of sealer penetration around the root canal walls in group III was significantly higher than other groups at all levels.

Conclusions: Regardless of the filling technique used, Sure Seal Root achieves a better filling quality and greater tubular penetration than AH Plus. Taking into account the excellent bioactivity of the Sure Seal Root sealer, it can improve the sealing of the root canal system.

PR12

Single Visit Root Canal Treatment Versus Pulpotomy in Management of Pulpitis

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ABSTRACT

Objectives: To evaluate the clinical success rate of pulpotomy in mature teeth with irreversible pulpitis. To compare pulpotomy with single visit root canal treatment (RCT) and show which has better radiographic improvement. Can pulpotomy be an alternative option for the management of irreversible pulpitis in mature teeth?

Methods: Twenty-four patients diagnosed with irreversible pulpitis in their mature permanent mandibular molars, were selected and randomly divided into two equal groups (single visit RCT or pulpotomy). For single visit RCT, canals were prepared by ProTaper NEXT rotary system. While in pulpotomy, after coronal pulp amputation and hemostasis, Biodentine was used as the pulpotomy agent. All teeth were finally restored by composite resin. The clinical examination was performed at baseline, 3, 6, 9 and 12 months. While the radiographic examination using cone beam computed tomography (CBCT) was carried out at baseline and 12 months. Statistical analysis was done using Chi-square and T-test.

Results: Single visit RCT had clinical success rate of 91.67%, while pulpotomy showed 83.33%. Radiographically, both groups showed reduction in PLMS and improvement in bone density with no statistically significance between groups.

Conclusions: Single visit RCT and pulpotomy had high success rate in management of mature permanent teeth with irreversible pulpitis. Pulpotomy can be considered as an alternative treatment option to RCT.

PR13

Healing Rate of Periapical Lesions After Using Different Intra-Canal Medications

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ABSTRACT

Objectives: The study aimed to evaluate the healing rate of periapical lesions following application of different as intra-canal medications. It assesses the healing progress clinically and radiographically using Cone Beam Computed Tomography (CBCT).

Methods: Thirty patients with periapical lesions less than 200 mm² in size were randomly selected, Perioperative CBCT images to verify lesion size and position were taken as a base line data. traditional root canal treatment steps were done. The patients were randomly assorted in 3 groups according to intra-canal medicaments (Calcium hydroxide for first group, Simvastatin for second group, while Epigallocatechin-3-gallate used for the third group). All medications were applied for 2 weeks before complete obturation of the canal. The patients were recalled at 6, 12 and 18 months for clinical and CBCT evaluation.

Results: No severe pain, complications, or failure was reported. 63.33% of cases showing complete healing in an average 6 months, while 30% of patient need a double of this period for healing. 6.66% of cases showed decrease in lesion size but not complete healing. A high rate of healing was reported in both first and second group in comparison to the third one.

Conclusions: Conventional root canal treatment should be the first conservative line of periapical lesion management. Intra-canal medicaments indicated antiseptic stimulative effect, which enhanced and shortened healing time of periapical lesions. Both Calcium hydroxide and Simvastatin showed a superior result compared to Epigallocatechin-3.

PR14

The Effect of Amorphous Calcium Phosphate Nanoparticles Loaded in Chlorhexidine as an Intracanal Medicament on The Enterococcus Faecalis Biofilm

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ABSTRACT

Objectives: The aim of this study was to evaluate the antimicrobial efficacy of 20% amorphous calcium phosphate nanoparticles loaded in chlorhexidine, as an intracanal medicament, against *Enterococcus faecalis* biofilm.

Methods: Dentin sections were inoculated with *E. faecalis* for 4 weeks to establish a standard mono-species biofilm model. Specimens were randomly divided into 4 groups (n=10) according to the medicament used: 20% amorphous calcium phosphate nanoparticles in chlorhexidine (NACP + CHX), 2% chlorhexidine (CHX), calcium hydroxide (Ca(OH)₂), and positive control. Samples were stained and evaluated under the confocal laser scanning microscope (CLSM). Images were analyzed with Zen imaging software to determine the percentage of live/dead cells in the dentinal tubules.

Results: All test groups showed a statistically significant bacterial elimination, ranging from 36.81% to 59.19% reduction ($P \leq 0.001$). CLSM analysis showed that NACP + CHX and CHX had the highest antibacterial effect without significant difference between them, calcium hydroxide demonstrated the least antibacterial effect amongst the test groups.

Conclusions: The findings of the present study suggested that NACP + CHX when used as an intracanal medicament, demonstrates antibiofilm efficacy against *E. faecalis* biofilm.

PR15

Microbial Evaluation Following Two Irrigation-Medication Protocols in Secondary Infection Cases

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ABSTRACT

Objectives: Evaluate the microbial effect of different irrigations on *E. faecalis*, evaluate the microbial effect different intracanal medications on *E. faecalis* and evaluate the microbial reduction when used irrigation and intracanal medication alternatively.

Methods: Thirty-two patients with single-canal teeth who had developed secondary infection were divided into four groups according to type of irrigation and intracanal medication used. Group 1 (2% CHX irrigation and intracanal medication), Group 2 (2% CHX irrigation and Propolis intracanal medication), Group 3 (30% Propolis irrigation and CHX intracanal medication), and Group 4 (30% Propolis irrigation and intracanal medication). The first microbial sample (S1) was obtained following complete removal of the primary filling material then the second sample (S2) was obtained following chemomechanical preparation with various irrigant solutions. Finally, the third sample (S3) was collected after the intracanal medication was removed. After cultivating the samples, growing colonies were counted and recorded as colony forming units (CFU).

Results: The third microbial sample recorded the lowest microbial count in all groups. No statistical significant difference was recorded between the rate of reduction of S2 to S1 among the groups while there was statistically significant difference in relation to S3 to S2.

Conclusions: Irrigation and intracanal medication both aid in microbial reduction, particularly in cases of secondary infection and CHX is effective in these cases.

PR16

Comparison of Postoperative Pain After Root Canal Shaping With Two Rotary Systems: A Clinical Trial

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ABSTRACT

Objectives: The aim of the study was to compare between postoperative pain intensity following root canal shaping with two rotary systems.

Methods: This research was conducted with the approval of the research ethics committee of the faculty of dentistry, Ain Shams University. Fifty patients were included in this study. All patients were asked to follow general instructions to sign an informed consent explaining the aim of study and to monitor their pre and postoperative pain grades on a numerical rating scale (NRS) at 6, 24, 48, 72 hours and 7 days postoperatively. Patients were randomly assigned into two groups according to the rotary system used for mechanical preparation. In Group A the preparation was done using rotary MPro files in the following sequence: #18 (4%), #20 (4%), #25 (6%) and #35 (4%), and in the Group B it was done using rotary Edge File X3 in the following sequence: N1: #17(6%), C1: #20(6%), C2: # 25(6%), C3 #30(6%) and C4 #40 (6%).

Results: No statistically significant differences in pain levels were found among the two groups, however, there was a statistically significant difference in analgesic intake between the two groups. Postoperative pain showed significant decrease at 24 hours interval in both groups.

Conclusions: No significant difference in postoperative pain levels after instrumentation with MPro or EdgeEndo X3 rotary file systems. Postoperative pain levels decline gradually with time.

PR17

Effect of Neo Mineral Trioxide Aggregate and Hydroxyapatite Nanoparticulates on Odontogenic Differentiation and Proliferation of Human Dental Pulp Stem Cells

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ABSTRACT

Objectives: Aim of the study was to evaluate the effect of Neo Mineral Trioxide Aggregate and Hydroxyapatite Nanoparticulates on odontogenic differentiation and proliferation of human dental pulp stem cells.

Methods: Materials: Nano NeoMTA2 and nanohydroxyapatite (NHAP). Methods: The materials were prepared and characterized. Human dental pulp stem cells (DPSCs) were isolated from three sound fully impacted third molars. DPSCs were isolated from dental pulp tissue using enzyme digestion method then cultured. When the cells reached 70% confluence, the cells were harvested and passaged. Cells from 3rd passage were used. Cells were seeded with the nanomaterials where, Group1: hDPSCs cultured in prepared Nano NeoMTA (9.92µg/ml), Group2: hDPSCs cultured in prepared Nano-hydroxyapatite(10µg/mL), Group3: Positive control group, hDPSCs cultured in odontogenic differentiation medium. Group4: Negative control group, hDPSCs cultured in DMEM. Plates were incubated for 72hours, each experiment was carried out in triplicate form. Cell differentiation was evaluated by alkaline phosphatase (ALP) activity and dentin matrix protein (DMP) expression using Immunofluorescence staining. Cell viability and proliferation were evaluated by trypan blue staining and MTT proliferation assay.

Results: The highest ALP activity was detected in hDPSCs co-cultured with Nano NeoMTA (77.95± 2.32), followed by NHAP group (68.01± 2.73). The DMP expression was reflected by H-score. The highest H-score (169.33± 4.04) was detected in Nano NeoMTA group, followed by NHAP group (140.33±2.52). The highest viable cell count was found in Nano NeoMTA group (3.51x10⁷), followed by NHAP group (7.69x10⁶). The highest proliferation potential was found in Nano NeoMTA group, followed by NHAP group.

Conclusions: Nano NeoMTA and NHAP biomaterials have the ability to induce odontogenic differentiation and proliferation of DPSCs.

PR18

The Antibacterial Activity of Lactobacilli Probiotics on Enterococcus Faecalis Biofilm.

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ABSTRACT

Objective: To evaluate the antibacterial activity of probiotics cocktail (PC); Lactobacillus plantarum, Lactobacillus rhamnosus and Lactobacillus acidophilus as an intracanal medication on Enterococcus faecalis (E. faecalis) biofilm after 24 hours and 7 days.

Methods: Sixty-four extracted human single-rooted teeth with standardized length were instrumented, sterilized, and inoculated with E. faecalis. After 21 days incubation, four specimens were randomly selected to validate the biofilm formation by scanning electron microscope. Then, they were randomly divided into: Group 1: PC 300 mg/ml in poloxamer gel, Group 2: calcium hydroxide paste (35% Ultra Cal XS Ca(OH)₂), Group 3: poloxamer gel alone Group 4: E. faecalis only (positive control), and Group 5: free from E. faecalis and/or the medication (negative control). These groups were subdivided into two subgroups according to the incubation period (24 hours and 7 days). Dentin shavings and paper points were used to collect the intracanal samples. The antibacterial action was assessed by bacterial count using bacterial colony-forming units per milliliter (CFUs/ml).

Results: All the tested medication showed a significant percentage of bacterial reduction ($p < 0.05$) except poloxamer, and the highest reduction was found in Ca (OH)₂ group followed by PC. A statistically significant difference was found between Ca (OH)₂ and PC after 24 hours ($p < 0.05$). However, a non-significant difference was found between them at day 7 ($p > 0.05$).

Conclusions: PC has potential antibacterial effect on E. faecalis comparable to Ca (OH)₂. Consequently, it can be used as promising intracanal medication.

PR19

Revascularization Induced Maturogenesis of Non-Vital Immature Teeth Using Different Scaffolds and Intra Canal Medications

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ABSTRACT

Objectives: Clinical and radiographical evaluation of revascularization induced maturogenesis of non-vital immature teeth using platelets rich plasma compared to blood clot as scaffold with two different intracanal medications (modified triple antibiotic paste and calcium hydroxide mixed with chlorhexidine) concerning root length increase, clinical and radiographical evaluation of revascularization induced maturogenesis of non-vital immature teeth using two different scaffolds with two different intracanal medications concerning root canal diameter decrease and clinical and radiographical evaluation of revascularization induced maturogenesis of non-vital immature teeth using two different scaffolds with two different intracanal medications concerning apical foramen diameter decrease.

Methods: Thirty-two patients aged between 9 and 20 years requiring endodontic therapy of maxillary central incisors were selected for this study. Patients were randomly divided into four equal groups (n=8) Group I: Blood clot scaffold and mTAP intra canal medication, Group II: PRP scaffold and mTAP intra canal medication, Group III: Blood clot scaffold and Ca(OH)₂ mixed with CHX intra canal medication, Group IV: PRP scaffold and Ca(OH)₂ mixed with CHX intra canal medication. Radiographic digital examination was done immediately postoperative and at 3,6,9 and 12months of follow-up under same circumstances.

Results: Platelets rich plasma produced better results compared to blood clot and modified triple antibiotic paste produced superior results compared to calcium hydroxide mixed with chlorhexidine concerning root length increase, canal width decrease and apical foramen width decrease.

Conclusions: Platelet rich plasma is better than Blood clot as a scaffold concerning root length increase, canal width decrease and apical foramen decrease. Modified triple antibiotic paste is better than calcium hydroxide mixed with chlorhexidine as intracanal medications concerning root length increase, canal width decrease and apical foramen decrease.