ABSTRACTS ENDO SUMMIT SUL

BALNEÁRIO CAMBORIÚ 2023

SCIENTIFIC RESEARCH

ID: 190/1001-0

EX VIVO EVALUATION OF THE EFFICACY OF PHOTODYNAMIC THERAPY IN ELIMINATING ENTEROCOCCUS FAECALIS FROM DENTINAL TUBULES BY CONFOCAL LASER SCANNING MICROSCOPY.

ROBERTA DE CASTRO LEITÃO GODOY, CARLOS EDUARDO DA SILVEIRA BUENO, ALEXANDRE SIGRIST, RINA ANDRÉA PELEGRINE, MARCO ANTONIO HUNGARO DUARTE, RODRIGO RICCI VIVAN E DANIEL PEDRO GUIMARÃES ROCHA*

The aim of the present study was to investigate ex vivo by confocal laser scanning microscopy (CLSM) the antibacterial effect of photodynamic therapy (PDT) on dentinal tubules in the apical 5 mm of human mandibular premolars contaminated with *Enterococcus faecalis*. Thirty-four teeth were standardized to 20 mm and foraminal anatomic diameters using instrument K#20. Samples were contaminated for 21 days and divided into three experimental groups(n=10): PDT group - instrumented canals and PDT; PUI group - instrumented canals and passive ultrasonic irrigation (PUI); PUI-PDT group - instrumented canals, PUI and PDT; and a control group (n=4): non-instrumented canals. The canals in the experimental groups were instrumented with ProTaper Next up to X3 and rinsed with EDTA-sodium hypochlorite.2,5%. The photosensitizer used was 0.01% methylene blue with a pre-irradiation time of 5 minutes and a diode laser with 4J energy and 660 nm wavelength, with a fiber optic coupling of 1 mm diameter. Cross sections were made 5 mm from the apex of all samples, which were taken for analysis by confocal laser scanning microscopy. The results were analyzed using the Shapiro-Wilk and Kruskal-Wallis (Dunn) tests. Results: There was a lower percentage of live bacteria in the PUI-PDT group, with a statistical difference compared with the control and PDT groups ($p < 0.05$). There was no statistical difference in the percentage of live bacteria between PUI-PDT and PUI ($p > 0.05$). Conclusion: It is concluded that the PUI-PDT association was most effective in disinfecting root canals compared to the control group and PDT, but equivalent when compared to the PUI group. This study was approved by te local research ethics committee under number 3.648.229

Keywords: Laser Scanning Confocal Microscopy; Low Power Laser Therapy; Photodynamic Therapy.

SCIENTIFIC RESEARCH

ID: 190/1002-0

EFFECT OF PUI AND EASY CLEAN IN THE REMOVAL OF FILLING MATERIAL AND APICAL EXTRUSION

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The aim of this study was to evaluate, in vitro, the effect of Passive Ultrasonic

Irrigation and Easy Clean on the removal and apical extrusion of filling material during endodontic retreatment. Thirty artificial maxillary premolars were adapted in specific devices, modeled with Reciproc R25 files and filled using the single cone technique and AH Plus cement. After 30 days, the root canals were unfilled, re-instrumented with Reciproc R25 and R40 files, and randomly divided into 3 groups according to the final irrigation protocol with 2.5% NaOCl (n=10): G1) Conventional irrigation (CI); G2) Conventional Irrigation + Passive Ultrasonic Irrigation (PUI); and G3) Conventional irrigation + Easy Clean (EC). Then, the teeth were longitudinally cleaved in the vestibulopalatal direction and observed under a stereomicroscope. The area of filling material remaining in the root canal and isthmus was measured in mm2 with the help of Image J software. The devices, whether or not containing filling material that was extruded apically, remained in an oven at 70°C for 5 days for evaporation of the irrigating solution and subsequent weighing. Data were analyzed using One way ANOVA and post hoc Tukey, and Kruskal-Wallis and post hoc Dunn tests (α = 5%). The final irrigation protocol PUI was effective in removing remaining filling material and provided better cleaning of root canals (P = 0.007) and isthmus regions (P = 0.045), when compared to CI. As for the apical extrusion of filling material, no significant difference was observed between groups (P > 0.05). The PUI final irrigation protocol promoted better cleaning of root canals and isthmus regions during endodontic retreatment. Both protocols extruded similar amounts of filling material.

Keywords: Apical Extrusion, Passive Ultrasonic Irrigation, Endodontic Retreatment.

SCIENTIFIC RESEARCH

ID: 190/1004-0

EVALUATION OF STAPHYLOCCOCUS EPIDERMIDIS BIOFILM DETECTED IN VITRO THROUGH DIFFERENT FLUOROPHORES

LÍVIA RAMOS ALVARIZA, LIVIU STEIER, MARIELI PRADEBON, JORDANA KOCH E JOSÉ ANTÔNIO POLI DE FIGUEIREDO.*

Biofilm is the main mediator of endodontic disease, and Staphylococcus epidermidis is one of the most prevalent bacterial species in cases of endodontic treatment failure. Fluorescence is na innovative and relevant diagnostic approach for the detection of bacterial biofilms, as it can help to differentiate healthy from contaminated tissues. This study evaluated the effect of different fluorophores on the visualization of S. epidermidis endodontic biofilm in bovine teeth. Forty-five (45) single-rooted teeth were contaminated with S. epidermidis for 48 hours, and then randomly assigned to 5 treatment groups: Negative Control, Positive Control, 5-ALA, Qubit and Calcein. Samples were clinically analyzed using Reveal FGS (ReVeal, Designs for Vision, New York, USA) and categorized as positive or negative for fluorescence and image scattering. Samples were also subjected to scanning electron microscopy (SEM) and colony-forming units (CFU) counting, which were statistically analyzed using Kruskal Wallis, Mann-Whitney, and ANOVA with Tukey post hoc (P<0.05) tests. Results showed that Calcein, Qubit, and 5-ALA were effective fluorophores for clinical visualization of S. epidermidis biofilm under UV light. However, 5-ALA was found to be the best fluorophore tested, as it showed a uniform fluorescence without image scattering, as well as antimicrobial properties against S. epidermidis biofilm.

Keywords: Staphylococcus Epidermidis, Fluorescence, Biofilm

CASE REPORT

ID: 190/1005-0

ENDODONTIC TREATMENT OF A FIVE ROOT CANAL LOWER MOLAR: CASE REPORT

LUIZ FERNANDO MONTEIRO CZORNOBAY, BIANCA PAES DA SILVEIRA, MARIA VICTÓRIA FEIJÓ ECHEVENGUÁ, MARIA EDUARDA PAZ DOTTO, JULIA MENEZES SAVARIS, LIVIA RIBEIRO, TAMER FERREIRA SCHIMDT, ANA MARIA HECKE ALVES, CLEONICE DA SILVEIRA TEIXEIRA E LUCAS DA FONSECA ROBERTI GARCIA

A proper knowledge of the dental anatomy and its variations is one of the factors that determine the success of endodontic therapy. This paper aims to present a clinical case report a lower molar with 5 root canals. The prevalence of mesiomedial canal in lower molars can range from 1 to 23%. A 33-year-old female patient presented fracture and infiltration of composite resin restoration required endodontic treatment in element 36. During the access surgery with the aid of the clinical operating microscope, the presence of 5 canals was observed: three in the mesial root (mesiobuccal, mesiomedial and mesiolingual), nd two in the distal root (distobuccal and distolingual). Initial exploration was performed with C-pilot manual files # 08e 10#, working length of all canals was established at 18 mm. Chemical-mechanical preparation was performed with Primary reciprocating file (25.07) from Wave One Gold technique (Denstply) and irrigation was performed with a 2.5% sodium hypochlorite solution. Ultracal XS (Ultradent) was used as intracanal medication for 30 days. In the second session, root canal obturation was performed by single cone technique and Sealer Plus cement (MK Life), a

provisional restoration was performed with Riva Light Cure Glass ionomer cement (SDI) and the patient was referred for an indirect ceramic restoration. Patient is asymptomatic and under clinical and radiographic follow-up. Knowledging dental anatomy, use of technology such as operative microscopy was fundamental for the accomplishment of this endodontic treatment. The inability to recognize and treat this accessory root canal may lead to endodontic failure.

Keywords: Endodontics, Anatomy, Anatomic Variation.

CASE REPORT

ID: 190/1006-0
ENDODONTIC REINTERVENTION IN DENS INVAGINATUS WITH CYSTIC LESION: CASE REPORT

LUIZ FERNANDO MONTEIRO CZORNOBAY, GABRIELA PASQUALIN GHIDINI, MARIA EDUARDA PAZ DOTTO, JULIA MENEZES SAVARIS, MARIA VICTÓRIA FEIJÓ ECHEVENGUÁ, LÍVIA RIBEIRO, TAMER FERREIRA SCHIMDT, ANA MARIA HECKE ALVES, CLEONICE DA SILVEIRA TEIXEIRA E LUCAS DA FONSECA ROBERTI GARCIA*

Dens invaginatus, also known as dens in dente, is a rare anomaly affecting human dentition and occurs as a result of the invagination of the enamel organ. These cases may present difficulties with respect to its diagnosis and treatment because of canal morphology. The prevalence of adult teeth affected with dens invaginatus is between 0.3% and 10%. This paper aims to present a clinical case report a endodontic retreatment in a tooth with dens invaginatus associated with a periapical odontogenic cyst. A 33-year-old male patient presented an acute periapical abscess associated with dental element 22. On radiographic and tomographic examination, it was observed that the tooth had dens invagitatus, periapical odontogenic cyst, two canals but only one (palatine) was endodontically treated. Drainage of the abscess was performed and removal of the obturator material in the palatine canal. With the aid of the clinical operating microscope, access to the vestibular canal was performed. Chemical-mechanical preparation was performed with large reciprocating file (45.05) from Wave One Gold technique (Denstply) and irrigation was performed ultrasonic-activated 2.5% sodium hypochlorite solution. Ultracal XS (Ultradent) was used as intracanal medication for 30 days. Then, an apicectomy was performed, removal of the cystic lesion and filling with bone graft. Root canal obturation was performed by the lateral condensation technique with epoxy resin-based cement (AH Plus, Dentsply). Afterwards, the tooth was restored with composite resin. Patient is asymptomatic and under clinical and radiographic follow-up. Adequate planning, as well as knowledge of the internal dental anatomy, the use of technologies such as operative microscopy was essential for carrying out this treatment.

Keywords: Endodontics, Dens In Dente, Anatomic Variation

LITERATURE REVIEW

ID: 190/1008-0
PATIENTS WITH OSTEOPOROSIS HAVE A HIGHER PREVALENCE OF PERIAPICAL LESIONS? SYSTEMATIC REVIEW OF CROSS-SECTIONAL STUDIES OF PREVALENCE. DISSERTATION

GABIANA RODRIGUES FREITAS, BÁRBARA LUZIA CAPITANIO, THEODORO WEISSHEIMER e MARCUS VINICIUS REIS SÓ*

Objectives: This systematic review aimed to evaluate available scientific evidence regarding the prevalence of periapical lesions in teeth of patients with osteoporosis. Methodology: Systematic searches were performed on PubMed, Cochrane Library, SCOPUS, Web of Science, EMBASE and Open Gray. Only clinical studies that compared the prevalence of periapical lesions in patients with osteoporosis with the prevalence of lesions in patients without osteoporosis were included. The quality of the studies and the overall evidence were assessed using the McGuinness and GRADE tools respectively. Results: Of the 429 potentially relevant studies, only 2 were finally included, of which one was classified as having a critical risk of bias and the other a moderate risk of bias. Both studies reported a higher prevalence of periapical lesions in patients with osteoporosis than in patients without osteoporosis (OR=3.36; $p<0.0001$) and (OR=4.2; $p=0.061$) in selected studies. GRADE analysis demonstrated low quality of evidence for the included studies, although there was a strong association of effect on the evidence. In one of the studies, it was shown that osteoporotic patients treated with bisphosphonates had a lower chance of developing periapical lesions, especially when risedronate was used (OR 1.34; $p<0.0001$) and patients treated with alendronate had an OR of 1.6 for prevalence of periapical lesion ($p<0.0001$). Conclusions: It is possible to conclude that the existence of periapical lesions in patients with osteoporosis was higher than in patients without osteoporosis. However, this evidence was low, requiring a greater number of well-designed studies for this trend to be strongly confirmed, as well as caution in interpreting the results.

Keywords: Endodontics, Osteoporosis, Periapical Lesions, Systematic Review.

SCIENTIFIC RESEARCH

ID: 190/1010-0

EVALUATION OF FILLING AND INTRATUBULAR PENETRATION IN THE ISTHMUS REGION AFTER DIFFERENT ROOT CANAL OBTURATION TECHNIQUES

LEONARDO THOMASI JAHNKE, WESLEY MISAEL KRABBE, GABRIEL BARCELLOS SÓ, PEDRO HENRIQUE FERREIRA DE MENEZES, MARCUS VINICIUS REIS SÓ, EMMANUEL JOÃO NOGUEIRA LEAL SILVA, FELIPE GONÇALVES BELLADONNA, RICARDO ABREU DA ROSA E RICARDO ABREU DA ROSA*

To evaluate the impact of the obturation technique (single cone, ultrasonic activation and single cone, Tagger's hybrid and thermoplasticized injectable gutta-percha) on filling the root canal and isthmus region of mesial roots of mandibular molars and on the intratubular penetration of an epoxy resin-based cement. Forty mandibular molars was scanned with computed microtomography for sample selection and divided into 4 experimental groups according to the obturation protocol: single cone (SC), ultrasonic activation and single cone (UASC), Tagger hybrid (THT) and thermoplasticized injectable gutta-percha (TPI). Rhodamine was added to the resin sealer. Ultrasonic activation was performed in the UA group for 20 seconds in each channel towards the isthmus. One week after the obturation, a new scan was performed to evaluate the filling quality. Afterwards, three slices were produced for each root, one of each root third for analysis in confocal laser scanning microscopy regarding intratubular penetration. One-way analysis of variance and Tukey's tests were performed to identify differences between the groups, both with a significance level of 5%. There were no differences among the groups regarding the final volume of voids and GAPs ($P > 0.05$). UASC protocol presented higher mean values of intratubular penetration than the other groups ($P < 0.05$). UASC group promoted higher intratubular penetration than the other obturation techniques in the cervical and middle thirds of the root canals ($P < 0.05$). The lowest intratubular penetration was observed for in the middle and THT for apical thirds ($P < 0.05$). The obturation techniques did not completely fill the root canals neither the isthmus. The ultrasonic activation of the resin-based sealer promoted higher intratubular penetration compared to the other techniques.

Keywords: Single Cone; Endodontic Sealer; Ultrasonic Activation.

SCIENTIFIC RESEARCH

ID: 190/1011-0

INFLUENCE OF THE OPERATOR'S EXPERIENCE ON THE CUTTING AND SHAPING ABILITY OF RECIPROC AND RECIPROC BLUE INSTRUMENTS IN SIMULATED CANALS WITH DOUBLE CURVATURE.

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The objective of the present study was to investigate the influence of the operator's experience on the cutting capacity, shaping and preparation time of files with different heat treatments, Reciproc and Reciproc Blue, in simulated canals with double curvature. One hundred and twenty resin blocks with S-shaped canals were randomly distributed among the groups according to the system used and the operator's experience (n=20): Groups RC1 and RC3 – instrument R25 inexperienced operators; Group RC2 – instrument R25 experienced operator; Group RCB1 and RCB3 – instrument R25 Blue – inexperienced operators; RCB2 Group - R25 Blue instrument – experienced operator. All canals were filled with pre-instrumentation Pelikan black ink and post-instrumentation red ink, which helped in the superposition of the images using the Photopea editor, thus enabling the evaluation of the modeling capacity of the systems. The cut capacity analysis was evaluated by the difference in weight pre and post instrumentation using an analytical balance, and the time to preparation was analyzed. To evaluate the data in relation to the modeling capacity of the instruments, the non-parametric Mann Whitney tests were carried out and to compare the operators the non-parametric tests of Kruskal Wallis and Dunn were carried out and a significance level of 5% was established. Regarding the cutting capacity of the instruments, there was no significant difference between the systems regarding the reduction in the weight of the simulated canals ($p>0.05$), however there was an important disparity between the operators ($p<0.05$). It was observed that the experience of the experienced operator (RC2 and RCB2) influenced the weight reduction of the canals, unlike the inexperienced operator (RC3 and RCB3) who showed a smaller decrease ($p<0.05$). On the other hand, when comparing the modeling capacity of the instruments, it was observed that the inexperienced operator (RCB3) caused greater wear on the inner side of the coronal curvature. Regarding apical deviation, there was no significant difference between the two systems ($p>0.05$). Regarding the preparation time, the experienced operator (RC2 and RCB2) presented the longest preparation time

($p<0.05$). It was concluded that the type of nickel-titanium alloy did not affect the cutting capacity of the instruments, but the operator's experience influenced the preparation,

Keywords: Root Canal Preparation. Dental Technology. Endodontics.

CASE REPORT

ID: 190/1012-0
ENDODONTIC MANAGEMENT OF DILACERATED MAXILLARY CENTRAL INCISOR: A CASE REPORT

BRUNA FERNANDA ALIONÇO GONÇALVES, ALEXANDRE KOWALCZUK, AMANDA DIAS DE CASTRO, LUIZA GIACOMET CASSOL, KARINA SANTOS FRASQUETTI, EVERDAN CARNEIRO, VÂNIA PORTELA DITZEL WESTPHLEN, ULISSES XAVIER DA SILVA NETO E ULISSES XAVIER DA SILVA NETO.*

Dilaceration is a developmental anomaly characterized by an abrupt change in the axial inclination between the crown and root of a tooth. Mechanical trauma to the deciduous predecessor tooth is believed to be a possible cause of dilaceration, leading to the abnormal development of the succeeding permanent tooth. The presence of dilaceration can complicate the diagnosis, access cavity preparation, root canal preparation, and filling during endodontic procedures. The objective of this study was to present a case of severe dilaceration in a maxillary central incisor with pulp necrosis in a 14-year-old boy, focusing on the endodontic management. According to the patient's father, the boy experienced an accident at the age of 3, resulting in avulsion of the two maxillary deciduous central incisors and the two maxillary deciduous lateral incisors. Cone-beam computed tomographic scans were used to accurately determine the position and extent of dilaceration in the root. The access cavity was prepared on the buccal surface of the tooth to provide direct access to the apical foramen. Root canal instrumentation was performed using size 15-35 NiTi Manual Instruments (Dentsply Sirona, Charlotte, North Carolina, USA) and WaveOne Gold Medium (Dentsply Sirona, Charlotte, North Carolina, USA). Throughout the instrumentation process, the canal was irrigated with 2.5% sodium hypochlorite (NaOCl) solution after each instrument, and the final irrigation was conducted using 2.5% NaOCl and 17% ethylenediaminetetraacetic acid (EDTA) solutions. After drying the root canal with sterile paper points, it was filled with gutta-percha and AH Plus root canal sealer (Dentsply Sirona, Charlotte, North Carolina, USA) using the hybrid condensation technique. Due to proper planning and the use of appropriate techniques, it was possible to perform the endodontic treatment in this case.

Keywords: Dilaceration; Endodontic Treatment; Trauma.

SCIENTIFIC RESEARCH

ID: 190/1015-0
THE PULP STONES: MORPHOLOGICAL ANALYSIS IN SCANNING ELECTRON MICROSCOPY AND SPECTROSCOPIC CHEMICAL QUANTIFICATION

MARIELI CHITOLINA PRADEBON, ALEKSANDRA PALATYNSKA ULATOWSKA, LIVIA RAMOS ALVARIZA, JÉSSICA NAIARA ARAÚJO DE SOUZA, JORDANA DA SILVA KOCH, KELLYN ROCCA SOUZA, GUILHERME VIANA JOTZ E JOSE ANTONIO POLI DE FIGUEIREDO.*

This work aimed to morphologically analyze the pulp pits and present their chemical quantification, identifying their main chemical elements. It also correlates the results with their possible induction mechanisms. Seven pulp nodules were collected from molar teeth needing endodontic treatment. The morphology of the stones was analyzed by scanning electron microscopy (SEM), and their chemical composition was determined by X-ray dispersive energy spectroscopy (EDX). These structures varied considerably in shape, size, and topography. The location of the calculi in the pulp cavity was the factor that most affected the morphology. When found in the pulp chambers, they had a nodular morphology, while those in the root canals had a diffuse shape, resembling the anatomy of the root canal. Chemically, the location of these nodules showed variance when in the pulp cavity and in relation to the relief of the structure. Topographically, the nodules presented heterogeneous relief, revealing smooth and compact areas contrasting with bumpy and porous ones. Damaged cells of the coronal pulp pre-establish mineralization, in which the diffuse morphological pattern is determined due to the presence the presence of larger caliber vascular bundles and higher collagen fiber. Therefore, it is essential to understand that the chemical, morphological and topographic analysis of these nodules provides a cross-referencing of information between theoretical and clinical research, which seeks to prevent and treat certain conditions.

Keywords: Pulp Calcifications, Endodontic Treatment, Mineralized Pulp Nodules.

SCIENTIFIC RESEARCH

ID: 190/1016-0
EVALUATION OF ROOT CANAL MORPHOLOGY OF MAXILLARY PREMOLARS OF A SOUTH BRAZILIAN SUBPOPULATION: A CONE-BEAM COMPUTED TOMOGRAPHY STUDY

LUIZA BONEZI BOFF, CARLOS EDUARDO DA SILVEIRA BUENO, DANIEL GUIMARÃES PEDRO ROCHA, CARLOS EDUARDO FONTANA, RINA ANDREA PELEGRINI, ANA GRASIELA DA SILVA LIMOEIRO, WAYNE MARTINS NASCIMENTO, RUGISLAINE REGINA LOPES CASTRO, EDUARDO NESELLO BARP, ALEXANDRE SIGRIST DE MARTIN E ALEXANDRE SIGRIST DE MARTIN*

Knowing the dental anatomy and the root canal system well are essential prerequisites for the successful execution of endodontic treatment. Many studies have already reported that the maxillary premolar presents a high variability in the internal configuration of the root canal. The aim of this study was to evaluate the anatomy variation of maxillary premolars in relation to the number of roots and root canal configuration through Cone Beam Computed Tomography images. The sample included patients of both genders, aged between 16 and 87 years. A total of 599 patient images were evaluated (313 female and 286 male). Two examiners independently evaluated the CT scans. Agreement between examiners was assessed using the Kappa test. The canals were evaluated according to the Vertucci classification, number of canals and number of roots. All analyzes were performed using the R program, with a significance level of 5%. The agreement between the two examiners was considered perfect and almost perfect by the Kappa test. The results indicated that there was a significant association between gender and the number of upper premolar roots ($p<0.05$). There was a higher prevalence of upper premolars with more than one root among men (48.3%) than among women (29.7%). For maxillary premolars with one root, there was a significant association between tooth position and root canal configuration ($p<0.05$). Among the second premolars, there was a higher prevalence of type I (53.1%) and Type III (20.2%) canals, and among the first premolars, there was a higher prevalence of type II canals (24.3%), IV (31.4%), V (2.1%), VI (5.7%) and VII (7.1%). Most teeth with two roots had a type IV root canal (97.3%). All teeth with three roots had type VIII root canal. It was concluded that most maxillary first premolars had two roots with a type IV configuration and this configuration was more frequent in men, while the second premolars had only one root, type I configuration and more frequent in women. There was a significant association between gender and the number of maxillary premolar roots in a southern Brazilian subpopulation.

Keywords: Anatomy. Endodontics. Root Canals. Cone Beam Computed Tomography.

SCIENTIFIC RESEARCH

ID: 190/1017-0

ANALYSIS OF OBTAINING APICAL PATENCY INDEXES DURING ENDODONTIC TREATMENTS CONSIDERING GENDER, AGE, PULPOPERIRADICULAR DIAGNOSIS AND CANAL/TOOTH—A CLINICAL STUDY

JAQUELINE DA SILVA NASCIMENTO, RICARDO MACHADO, ULISSES XAVIER DA SILVA NETO, CLAUDEMIR DE SOUZA JÚNIOR, EDUARDO DONATO EING ELGELKE BACK, DANIEL COMPARIN, SÉRGIO APARECIDO IGNÁCIO E ULISSES XAVIER DA SILVA NETO.*

This study aimed to perform an analysis of obtaining apical patency indexes during endodontic treatments considering gender, age, pulpoperiradicular diagnosis and canal/tooth (n. 639/383). Following previous clinical procedures, a thin K-File (No. 20, 15, 10 or 08) was used to achieve apical patency. These specific data and some demographic and clinical information were submitted to the statistical analysis ($p < 0.05$). Significant statistical differences were not identified considering gender ($p = 0.156$) and age ($p = 0.793$). However, in 14.6% of the canals of vital teeth and 14.1% of the canals of necrotic teeth without periapical lesions, apical patency could not be achieved, which occurred in only 7% of the canals of necrotic teeth with periradicular disease ($p = 0.009$). Considering canal/tooth, apical patency was more challenging to obtain in canals of posterior teeth ($p = 0.000$). The pulpoperiapical diagnosis and canal/tooth significantly influenced the obtaining of apical patency.
(CAAE. 45492115.2.0000.0109)

Keywords: Apical Patency; Pulpoperiradicular Diagnosis; Root Canal.

SCIENTIFIC RESEARCH

ID: 190/1019-0

INTERFACIAL ADAPTATION AND PRESENCE OF GAPS OF NEOMTA PLUS, BIOROOT RCS AND MTA IN ROOT-END CAVITIES: A MICRO-CT STUDY.

SHEILA AIOLFI TITTON, MURILO MÂNCIO DOS SANTOS, LEONARDO THOMASI JAHNKE, GABRIEL BARCELOS SÓ, CAROLINE ROESCH MAYER, LUCAS SIQUEIRA PINHEIRO, MARCUS VINÍCIUS REIS SÓ E RICARDO ABREU DA ROSA*

This study aims to evaluate the interfacial adaptation of NeoMTA Plus, BioRoot RCS, and MTA in the apical cavities of bovine incisors.Thirty standardized bovine roots measuring 15 mm in length were selected. Chemical-mechanical preparation was performed using the apex-crown technique up to instrument #80 and obturation using the lateral condensation technique with cement based on zinc oxide and eugenol. The

roots were kept at 37º C for seven days. Afterward, apicectomy of the apical 3mm was performed, and retro-end filling with a high-speed dental handpiece (drill 330) drill at 3mm depth. Computed microtomography (micro-CT) was performed to measure the volume of the retroactivity. The roots were divided by stratified randomization into three groups according to the retro-end filling material: NeoMTA Plus, BioRoot RCS, and MTA. A new micro-CT was performed to assess the presence of voids in the root-end filling material and between it and the canal wall. One-way ANOVA and Tukey tests were performed using the BioEstat 4.0 program. There was no difference in the initial volume values of the retrocavities ($P > 0.05$). After insertion of root-end filling materials, the largest volumes of voids were observed in the NeoMTA Plus group ($P < 0.05$), with no difference for the BioRoot RCS and MTA Angelus groups ($P > 0.05$). MTA, and BioRoot RCS have better interfacial adaptation than NeoMTA Plus when used as root-end filling materials and analyzed by Micro CT.

Keywords: Apical Surgery; Root-End Filling Material; Micro-Computerized Tomography.

CASE REPORT

ID: 190/1020-0

TISSUE REPAIR OF EXTENSIVE ROOT RESORPTIONS FOLLOWING DENTOALVEOLAR TRAUMA: A CASE REPORT

BRUNA FERNANDA ALIONÇO GONÇALVES, ALEXANDRE KOWALCZUK, EVERDAN CARNEIRO, VÂNIA PORTELA DITZEL WESTPHALEN, ULISSES XAVIER DA SILVA NETO E ALEXANDRE KOWALCZUK.*

Root resorption is characterized by the loss of hard dental tissue due to odontoclastic activity. Damage to blood vessels in the periodontal ligament can lead to hypoxia, resulting in the death of cementoblasts and initiating the process of root resorption by odontoclasts. External cervical resorption can lead to premature loss of the affected tooth, especially if there is contamination from periodontal disease. This study aims to report a clinical case of a female patient who suffered dentoalveolar trauma, resulting in subluxation of tooth 22 and the development of deep root resorptions in the middle and cervical thirds, as verified by cone-beam computed tomography. The prognosis for the case was challenging. However, a treatment plan was proposed, involving the chemical-mechanical preparation of the root canal system and the use of calcium hydroxide intracanal medication. The high pH of calcium hydroxide was considered beneficial in halting osteoclastic activity. Several exchanges of the calcium hydroxide paste were performed at 30-day intervals. After 4 months of follow-up, stability of the resorptive process was observed, allowing for root canal obturation. Tissue repair of the resorbed areas was noted during follow-up appointments. Root resorption is often challenging to diagnose and manage accurately. However, this case report presents an alternative approach that resulted in successful treatment. This outcome highlights the importance of a careful and individualized approach in managing root resorption, allowing for the best prognosis for affected patients.

Keywords: Root Resorption; Calcium Hydroxide; Cone-Beam Computed Tomography.

CASE REPORT

ID: 190/1021-0

ROOT CANAL RECOVERY IN THE DISTAL ROOT OF THE LOWER FIRST MOLAR (46): CASE REPORT

MARIANA ROSADO SCHEFFER, EDUARDA MILENA DALL AGO KRAULICH, MICIELE DOS SANTOS, SILVIA BALZAN, LETICIA LEMES, TIAGO LANGE DOS SANTOS E TIAGO LANGE DOS SANTOS*

The present work consists of a clinical case report of element 46, where there was a deviation in the distal canal. The patient did not have exacerbated pain or edema, just a slight discomfort in the gingival region. A plan was made to carry out the retreatment, initially with the request for a tomography. Then, an attempt was made to remove the gutta percha via coronary access, however, when trying to remove the gutta percha cone, it broke and remained at the middle third of the root. Then, the perforation was closed with MTA in the lingual and distal part where the cone was located, followed by the placement of the CIV. In the second session, surgical removal of the gutta percha was performed. In the following session, the distal canal was located, and the canals were unobturated and instrumented, with the Easy system and also placement of calcium hydroxide (ultracal). After 15 days, endodontics was completed. In this case report, the techniques for unobturation, instrumentation and final obturation of a canal deviation were discussed.

Keywords: Retreatment, Overtreatment.

SCIENTIFIC RESEARCH

ID: 190/1022-0

A NEW METHOD OF ACCESS AND ENDODONTIC TREATMENT GUIDE: LABORATORY STUDY

ARTHUR BALEN, TIAGO LANGE DOS SANTOS, LETÍCIA LEMES, SÍLVIA BALZAN e TIAGO LANGE DOS SANTOS*

This work explores a new method of access and endodontic treatment guide using 3D printing technologies and 3D modeling software. The objective is to evaluate the precision and effectiveness of this method, comparing it with currently used conventional methods. The study uses materials such as InVesalius Program, Meshmixer Program, Ultimaker Cura Program, 3D Printer Ender 3 v2, PLA filament, and Kiri Engine Program, in addition to an artificial tooth for endodontic treatment practice. The obtained results aimed to assess the adaptation of the guides to the PLA tooth and the artificial tooth, and the guidance of files into the cervical third of their respective teeth. The adaptation of the guides to the PLA teeth and the artificial tooth was satisfactory, and the guides provided precision in guiding the files. The new method showed advantages over conventional methods, reducing treatment time, decreasing the risk of failure, and making the low cost for guide fabrication accessible.

Keywords: Three-Dimensional Printing, Computer-Aided Design

SCIENTIFIC RESEARCH

ID: 190/1023-0

EVALUATION OF THE VIABILITY AND CELLULAR BIOACTIVITY OF EMDOGAIN AS A VEHICLE FOR MINERAL TRIOXIDE AGGREGATE

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To evaluate the viability and cellular bioactivity of Mineral Trioxide Aggregate (MTA) associated with Emdogain (EMD). The samples were divided into 3 experimental groups: G1= MTA + Water, G2= MTA + EMD and G3= MTA + Water + EMD. The specimens followed ANSI/ADA specification number 57. For cellular assays, Saos-2 osteoblastic cells and Mrc-5 fibroblasts were used. Cell viability was evaluated by the MTT test after 24h. To evaluate the bioactivity and formation of mineralization nodules, alkaline phosphatase (ALP) and alizarin red tests were performed, respectively. Data were analyzed by analysis of variance, one-way ANOVA and Tukey's post-hoc tests. The significance level was set at 5%. In the MTT test, greater viability and cell perspectives were observed in the MTA + EMD group, both in Mrc-5 cells and in Saos-2 cells ($P<0.05$). In addition, a higher rate of ALP and formation of mineralization nodules was seen when the MTA + EMD combination was used for both seven and fourteen days ($P<0.05$). The addition of EMD to MTA demonstrated increased viability and cell experience and increased ALP compared to MTA with water. In addition, there was a significant increase in the amount of production of mineralized nodules.

Keywords: Endodontics, Mineral Trioxide Aggregate, Emdogain

LITERATURE REVIEW

ID: 190/1026-0

WHAT IS THE PREVALENCE OF APICAL PERIODONTITIS IN PATIENTS BEFORE HEMATOPOIETIC CELL TRANSPLANTATION? A SYSTEMATIC REVIEW.

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Hematopoietic cell transplantation is the treatment of choice for several diseases that affect the production of stem cells and elements of the immune system. Complementary measures are necessary for this transplant to avoid possible rejection, such as radiotherapy and/or chemotherapy. These measures can have consequences for the patient, including oral complications. The purpose of the present review is to answer the following question: "What is the prevalence of apical periodontitis in patients before hematopoietic cell transplantation?". A systematic search was performed in the PubMed, Cochrane Library, SciELO, Web of Science, EMBASE and Grey Literature Report. The eligibility criteria were based on the PECOS strategy, as follows: (P) patients (adult and pediatric); (E) need for hematopoietic stem cell transplant; (O) apical periodontitis; (S) observational (prospective and retrospective) studies. Cochrane Risk of Bias in Exposure Studies tool was performed to assess the quality of the included studies. Overall quality of evidence was assessed through the Grading Recommendations Assessments, Development, and Evaluation (GRADE) tool. In total, eight studies were included according to eligible criteria. One study was classified as having 'very high risk of bias', one as 'high risk of bias', and six were classified as having 'some concerns'. The GRADE analysis demonstrated a very low quality of evidence. Significant limitations regarding the lack of control of confounders were verified. This systematic review indicates, with a very low certainty of evidence, that there's a low to medium prevalence of apical periodontitis in patients before hematopoietic cell transplantation.

Keywords: Bone Marrow Transplantation, Hematopoietic Stem Cell Transplant, Endodontics, Apical Periodontitis, Systematic Review.

LITERATURE REVIEW

ID: 190/1027-0
3D PRINTING IN ENDODONTICS

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Endodontic training constitutes the bulk of dental education for undergraduate and graduate students, in which they must be adequately trained to perform good quality root canal treatments. Extracted human teeth have been used for many years in order to teach endodontic procedures in the pre-clinic, however, there are disadvantages of using this type of material, including the risk of cross-infection, difficulty in obtaining it, standardization and ethical factors. What came to stimulate the development of alternative simulators, among them 3D printing, which is a specific ceramic modeling technique, but simple, possible to reproduce a series of important characteristics as close as possible to the natural tooth, in terms of instrumentation, radiography and obturation, in addition to the composition, microstructure, hardness and anatomy of the canal. Its manufacturing process can be easily adapted to produce any channel shape and any characteristics. However, in endodontic treatment it is suitable for determining the working length of the apex, in addition to being excellent for training students (being possible to simulate a complete treatment, from caries excavation, coronal opening, instrumentation, obturation and restoration) and to perform research into new technologies. Works from the last 5 years that presented full text for analysis were included for this study. Soon after, it was verified that of the 35 articles that were analyzed, regarding the relationship in their content, abstract and theme, only 3 articles were selected for the development and construction of this work.

Keywords: Printing, Root Canal Irrigants, Endodontics

SCIENTIFIC RESEARCH

ID: 190/1028-0
STUDY ON ENDODONTIC FILES M OF NICKEL-TITANIUM WITH SIMULATION IN ACRYLIC RESIN BLOCKS

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In endodontics, many transformations have been observed over time. Numerous advances have been achieved, from changes in the compositions of materials, in the improvement of endodontic protocols, to technological development, such as motors and endodontic techniques. The performance of an adequate cleaning and a satisfactory disinfection of the conduits during the preparation are important obstacles to achieve a positive result in the endodontic treatment. One of the biggest changes in endodontic practice was the insertion of the Nickel-Titanium alloy for the manufacture of files, providing advantages when compared to conventional endodontic files, which are rigid and do not provide adequate flexibility, making instrumentation difficult, especially in curved and atresic channels. The objective of this work is to present the advantages of the use of M files, through the performance of durability and cutting power tests. Evaluate how many channels can be run safely without accidents and complications, such as fractures. Describe the characteristics and properties of the files and clarify the advantages over the conservation of the dental remnant. The work is characterized as an experimental study in an in vitro laboratory, where Easy resin blocks were used, simulating a molar with 3 conduits with varying curvatures, nickel-titanium M files from Bassi and Easy of first series (15-40) with taper 0.03 and files M orifice shaper 15.08 used in the region that represents the 1/3 cervical of the preparation, as a pre-enlargement. We performed 18 root preparations with orifice shaper files 15.08, and 17 were successfully completed with M files (15-40) of taper 0.03. It was concluded that Easy's Nickel-titanium M files can be used safely without fractures. This was shown in up to 17 simulated channels in acrylic resin blocks.

Keywords: Endodontics, Root Canal Preparation, Endodontic Files

SCIENTIFIC RESEARCH

ID: 190/1029-0
ANALYSIS OF PH, CALCIUM ION RELEASE, AND ENERGY DISPERSIVE SPECTROSCOPY OF A BIOCERAMIC ROOT CANAL DRESSING.

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This study compared the pH and calcium ion release of calcium silicate-(Bio-C Temp) and calcium hydroxide-based (Ultracal XS) medications. Intracanal remnants of both medications were also evaluated using SEM-EDS after the removal protocol. Thirty-five bovine teeth were prepared. Fifteen were filled with Bio-C Temp and 15 with Ultracal XS. Five remained without intracanal medication (control group). Five samples from each experimental time (i.g. 24, 72, and 168 hours) were used to measure pH and calcium ions

release using a digital pH meter and microplate reader, respectively. Afterward, the peaks of the chemical elements composing both medications were analyzed in SEM-EDS. One-way ANOVA and Tukey's post hoc test analyzed the pH and calcium ion release data. Student's t-test compared the medications in each experimental time. SEM-EDS described the percentage of chemical elements in the samples. Bio-C Temp and Ultracal XS showed a significant pH increase from 24 to 168 hours ($p<0.05$). Ultracal XS showed a higher pH value at 24 hours than Bio-C Temp ($p<0.05$) but were similar at 72 and 168h ($p > 0.05$). Calcium ion release did not depend on the experimental period ($p > 0.05$). Bio-C Temp showed lower calcium ions release than Ultracal XS at 24 hours ($p<0.05$). SEM-EDS analyses showed the remains of both medications, but the concentration of Si, Al, and W ions was present only in the calcium silicate-based medication. Bio-C Temp presented alkaline pH and a satisfactory calcium ion release along the time. Remaining of both medications were present after the protocols for paste removal.

Keywords: Calcium Silicate-Based Medication, Calcium Hydroxide-Based Medication, Energy Dispersive X-Ray Spectroscopy.

CASE REPORT

ID: 190/1033-0
ASYMPTOMATIC APICAL PERIODONTITIS: CASE REPORT

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Asymptomatic apical periodontitis is a microbial and inflammatory disease, acting as a defensive inflammatory response of the host, causing bone resorption, resulting in granulation tissue. The objective of this report is to clarify the importance of endodontics, facilitating the bacterial reduction of the canals with medication changes between consultations. R.V., a male, went to the Lange Dental Clinic, reporting having undergone orthognathic surgery, which resulted in necrosis of elements 14 and 15. Clinically, pain absent, no changes, no fracture, with complete apexes, thickened periodontal ligament, periapex with discontinuous alveolar cortical, alveolar bone with rarefaction. Diagnosis: Asymptomatic Apical Periodontitis. Treatment: endodontics. In element 15, both channels, CRT 18.5mm. In element 14, CRT in the vestibular canal 20.5mm and in the palatine canal 19.5mm. Both sessions, the instrumentation was performed with Easy Logic2 system files 15.03, 25.03, 30.03 and memory file 35.03. Agitation of sodium hypochlorite 2.5% with ultrasound, drying of the channels with absorbent paper cones, intracanal ultrasound medication, temporary sealing with VSD and systemic medication Beserol. Second consultation, anesthesia, mechanical chemical preparation, agitation of sodium hypochlorite 2.5% with Easy clean and final toilette with EDTA activated with Easy clean, three times of 20 seconds. Performed again the agitation of the auxiliary chemical, drying of the channels, cementation with cement AH plus together with gutta-percha cone Bassi. Following with cutting of the cones, cleaning of the pulp chamber, sealing of the entrance of the channels with cavitec, restoration with composite resin and radiography of both elements. It was concluded that asymptomatic periapical lesions come from pulp trauma due to several factors. Two endodontic sessions are recommended to solve this type of apical pathology added to the correct root chemical sanitization. Follow-up of the case is fundamental for the regression of the lesion and that success is achieved, bringing benefits to our patient.

Keywords: Apical Periodontitis, Endodontics, Intracanal Medication

CASE REPORT

ID: 190/1034-0
IMPORTANCE OF KNOWLEDGE OF ANATOMICAL VARIATIONS OF THE LOWER CENTRAL INCISOR IN ROOT CANAL THERAPY: A CASE REPORT

RAQUEL DA COSTA MARTINS E LUIZ ROBERTO COUTINHO MANHÃES JR*

The anatomy of the root canal system directly influences the diagnosis, planning, prognosis, and success of the endodontic intervention. Each group of teeth has similar characteristics, but in some situations complex variations may occur, hindering and/or compromising treatment efficacy. Thus, a thorough clinical and radiographic examination is necessary to identify such anatomical variations. The aim of this paper is to present a clinical case report of root canal therapy in mandibular central incisor that presented anatomic variation with two root canals in pulp necrosis associated with periapical lesion. A male patient was referred to the dental clinic of Sest Senat in need of root canal therapy. After identifying the anatomic variation by radiographic examination and later confirmed by access surgery, the canals were treated using Protaper Gold® instruments, observing that the presence of two root canals does not modify the biomechanical preparation techniques, irrigating solutions, intracanal medication and obturating cements that were used, but the care in instrumenting both root canals. The treatment was performed in two sessions. Clinical and radiographic follow-up will be performed for a minimum period of 2 years. It was concluded that the success of root canal therapy depends on knowledge

of the internal anatomy of the teeth as well as the anatomical variations present, especially in the mandibular central incisor, for diagnosis and correct identification of root canals that need to be treated. A good initial radiographic image is of great importance for the identification of these anomalies.

Keywords: Endodontics; Root Canal Therapy; Anatomic Variation

SCIENTIFIC RESEARCH

ID: 190/1035-0
CYCLIC AND TORSIONAL FATIGUE RESISTANCE OF A NEW ROTARY FILE ON A ROTARY AND RECIPROCATING MOTION.

CAROLINE ROESCH MAYER, GABRIEL BARCELOS SÓ, MARCO ANTÔNIO H. DUARTE, MARCUS VINICIUS REIS SÓ, MURILO ALCALDE, PEDRO CALEFI, RODRIGO RICCI VIVAN E RICARDO ABREU DA ROSA*

This study evaluated the cyclic and torsional fatigue resistance of a new nickel-titanium (Flat File 25.04) instrument on the continuous and reciprocating motion. Sixty instruments of the ProDesign Logic2 25.03 and 25.05 (Easy Equipamentos Odontológicos, Belo Horizonte, Brazil), and MK Flat File 25.04 (n=20) (MK Life, Porto Alegre, Brazil) were used. For the cyclic fatigue test, an artificial stainless steel simulated canal with an angle of 60° and a radius of curvature of 5 mm located 5 mm from its tip was used. The torque and rotation angle at the instruments' failure on the torsional fatigue test was based on the ISO 3630-1 protocol, in which the 3 mm tip of each instrument was fixed and connected to an electric motor and a load cell. The fractured surface of each fragment was examined by scanning electron microscopy. Data were analyzed using a 1-way analysis of variance and Tukey's test with a significance level of 5%. Flat File 25.04 had lower cyclic fatigue in both kinematics than the Logic instruments ($P < 0.05$). Reciprocating motion improved the cyclic fatigue of the tested instruments ($P < 0.05$). Flat File 25.04 had similar torque to Logic2 25.05 ($P > 0.05$), and both were superior to Logic2 25.03 ($P < 0.05$). The angular deflection values were different for the three tested instruments ($P < .05$), in the decreasing order: Logic2 25.03, 25.05, and Flat File 25.04. Flat File presented good resistance to cyclic and torsional fatigue resistance. Reciprocating motion improved the cyclic fatigue resistance of the instruments and can be considered when using programmable motors.

Keywords: Endodontics. Cyclic Fatigue. Torsional Resistance.

SCIENTIFIC RESEARCH

ID: 190/1037-0
INFLUENCE OF STORAGE TEMPERATURE ON BOND STRENGTH OF ENDODONTIC SEALERS TO ROOT DENTIN

MARIA EDUARDA PAZ DOTTO, DANIELA PERESSONI VIEIRA SCHULDT, TAYNARA SANTOS GOULART, JULIA MENEZES SAVARIS, LUIZ FERNANDO MONTEIRO CZORNOBAY, LUIZ CARLOS DE LIMA DIAS JUNIOR e CLEONICE DA SILVEIRA TEIXEIRA*

The aim of this study was to investigate the influence of three different storage temperatures on the extrusion shear bond strength of endodontic sealers to root dentin. A total of 81 slices of 1.0 mm thick root dentin were obtained from 50 mandibular human premolars. In each slice, three cavities of 1.2 mm in diameter were made parallel to the root canal wall, maintaining a constant distance of 1 mm between them, between the cementum and between the root canal walls. The cavities were filled with BioRoot RCS, Endomethasone N and AH Plus Jet cements, which had previously remained for 30 days at controlled temperatures of 5ºC, 20ºC or 35ºC (n=24). After seven days, the bond strength shear by extrusion test (push-out) was performed in a universal testing machine at a crosshead speed of 0.5mm/min. The failure mode was analyzed under a stereomicroscope. Statistical analysis was performed using Kruskal-Wallis and Dunn's post hoc tests ($p = 0.05$). BioRoot RCS and Endomethasone N sealers were affected by the different storage temperatures, where the values obtained for the sealers stored in 5ºC and 35ºC were statistically lower when compared to sealers stored in at 20ºC ($p < 0.0001$ e $p = 0.004$, respectively). On the other hand, the AH Plus Jet sealer showed no difference in values at any of the investigated temperatures ($p = 0.098$). The different storage temperatures influenced the bond strength shear by extrusion values of the BioRoot RCS and Endomethasone N cements but did not influence the values found for the AH Plus Jet. Although it is an initial study, the 20ºC storage temperature can be suggested.
N° CEP: 5.556.298

Keywords: Endodontic Sealers, Push-Out Bond Strength To Root Dentin

SCIENTIFIC RESEARCH

ID: 190/1038-0
ANALYSIS OF MORPHOLOGY AND SYMMETRY OF THE ROOT CANAL SYSTEM OF INCISORS, PREMOLARS AND MANDIBULAR MOLARS USING CBCT

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CAROLINA PESSOA STRINGHETA, POLLYANE BORTOLUCCI HARTMANN E ALEXANDRE SIGRIST DE MARTIN

The purpose of this study was to evaluate the morphology and symmetry of incisors, premolars, and mandibular molars using cone beam computed tomography (CBCT). Descriptive statistical analysis was performed for the frequency of categorical variables and, when appropriate, a chi-square test or Fisher's exact test was used to test the relationship between sex and side compared with the number of roots, number of canals, and Vertucci classification. Forty-five CBCT scans were evaluated, and 444 mandibular teeth were analyzed. Of these, 120 were molars, 148 were premolars, and 176 were mandibular incisors. When the axial, coronal, and sagittal sections were examined, the number of roots, the number of canals, the nature of the canals in each root according to the Vertucci classification, and the presence of a symmetrical relationship between pairs of posterior teeth were analyzed. It was found that 100% of mandibular incisors had a single root; 74% of mandibular central incisors (ICi) had one canal and 26% had two canals; 73% of mandibular lateral incisors (ILi) had one canal and 27% had two canals, with a significant difference in the number of canals between the male and female groups ($p < 0.05$). The frequency of a single root was higher in the premolars. In mandibular first premolars (1PMi), one canal was detected in 70.5% and two canals in 29.5%; in mandibular second premolars (2PMi), a single canal was detected in 98.5%. The mandibular first molar (1Mi) was observed with two roots in 98% and three roots in 2%. The second mandibular molar (2Mi) had two roots in 92.5% of cases, one root in 6%, and three roots in 1.5%. The 2Mi was the tooth with the most variations in Vertucci classification in both roots. Symmetry was greater in females compared to males in central incisors. It can be concluded that teeth of the same group can have different morphologies in the same patient.

Keywords: Endodontics; Anatomy; Permanent Teeth.

CASE REPORT

ID: 190/1039-0
CLINICAL MANAGEMENT OF OROFACIAL TRAUMA INCLUDING MULTIPLE AVULSIONS, LATERAL LUXATION AND ALVEOLAR FRACTURE: FIVE-YEAR FOLLOW-UP.

JULIA MENEZES SAVARIS, FILIPE COLOMBO VITALI, MARIA EDUARDA PAZ DOTTO, LUIZ FERNANDO MONTEIRO CZORNOBAY, GABRIELA SUMAR, CHARLES MARIN, DILMA HELENA NEVES HENRIQUES E CLEONICE DA SILVEIRA TEIXEIRA.*

The concomitant occurrence of different types of trauma can make it difficult to establish the most appropriate treatment. This report describes the clinical management of complex orofacial trauma, including multiple avulsions, lateral luxation, and alveolar fractures, and its sequelae after five years of follow-up. A 19-year-old woman sought emergency care after an accidental fall that resulted in the avulsion of teeth 11, 21, and 41; complicated crown fracture and lateral luxation of tooth 12; uncomplicated crown fracture of tooth 22; and a fracture of the maxillary alveolar bone. Immediate treatment included surgical reduction of the lateral luxation and bone fracture, followed by the initiation of endodontic treatment and late reimplantation of the maxillary central incisors. Rigid restraint was applied for stabilization. Subsequent visits involved the completion of endodontic treatments, removal of the retainer, dental implantation to replace the avulsed lower incisor, and esthetic rehabilitation. Follow-ups were carried out every six months and then annually, showing good results up to four years after the trauma. In the five-year follow-up, Cone Beam Computed Tomography images were performed, showing advanced root resorption involving the reimplanted incisors. This report demonstrates that adequate knowledge about trauma by clinicians is essential for the management of more complex cases. Additionally, it highlights the importance of prolonged follow-up in cases of avulsion and reimplantation, due to long-term sequelae.

Keywords: Dental Avulsion, Dental Fractures, Dental Luxation, Dental Trauma

CASE REPORT

ID: 190/1040-0
GUIDED ENDODONTICS FOR ROOT CANAL LOCATION APICALLY TO AN EXTERNAL RESORPTION

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The aim of this study is to report a clinical case of calcification in the cervical third of a tooth with external root resorption using guided endodontics. The patient was referred for endodontic treatment of tooth 21. Imaging examinations revealed the presence of external root resorption in the middle third of the root and mineralization of the root canal in the cervical third. Clinical examination showed acute pain upon cold thermal testing and positive vertical percussion. A guide for endodontic access was then fabricated. After local anesthesia, enamel was removed from the palatal region using a diamond tip 1012, and the guide was positioned. The access was completed with a drill 103.395, reaching the area of resorption. After rubber dam isolation,

the apical location of the root canal was determined beyond the resorptive defect using a K-file #10. Electronic and radiographic working length measurements were taken, and chemomechanical preparation was performed using a Wave One Gold instrument #45.05. The removal of granulation tissue from the resorbed area was carried out with a Clearsonic Black ultrasonic insert. Sodium hypochlorite 2.5% (NaOCl) and 17% EDTA were used as irrigating solutions activated with an Irrisonic ultrasonic tip. Ultracal paste was used as an intracanal dressing for 15 days. In the subsequent session, the intracanal medication was removed using an Irrisonic ultrasonic insert and irrigating solution. The apical portion of the canal was obturated using the weakened cone technique and AH Plus sealer. The resorbed area and the rest of the canal were obturated with Bio-C Repair. The access cavity was temporarily restored with glass ionomer. The patient returned after 8 months for clinical and radiographic follow-up, showing no clinical or radiographic alterations. Guided endodontics allows access to calcified canals with greater safety, causing less damage to the tooth structure and avoiding possible complications.

Keywords: Guided Endodontics, Canal Obliteration, Root Resorption.

CASE REPORT

ID: 190/1041-0
SURGICAL RETREATMENT FOR PERIAPICAL CYST TREATMENT

THAINE OLIVEIRA LIMA, RODRIGO RICCI VIVAN, MARCO ANTÔNIO HÚNGARO DUARTE, GUILHERME FERREIRA DA SILVA, STEFANI JOVEDI ROSA, PAULO ROBERTO JARA DE SOUZA E MURILO PRIORI ALCALDE.*

The biological objective of endodontic treatment is to prevent or control apical periodontitis. However, treatment failure may occur due to the persistence of microorganisms in the root canal systems, extra-radicular infections and cystic lesions. Therefore, endodontic surgery may become necessary. The objective of the present work is to report a clinical case, describing step by step a parendodontic surgery for the treatment of periapical cyst. Patient, male, 46 years old, presented with a complaint of increased volume in the region of hard palate in the region of teeth 11 and 12, persisting after endodontic treatment and retreatment. The radiographic examination revealed the presence of a radiolucent lesion, circumscribed by a radiopaque halo, affecting the apexes of units 11 and 12, suggestive of a periapical cyst. After anamnesis and thorough evaluation of the cone beam tomography, endodontic surgery was indicated to remove the lesion and biopsy. During surgery, citrine yellow liquid was obtained through puncture. Apicectomy was performed, with retrograde obturation using Sealer cement 26 in dense consistency, apical plasty. Then, a collagen membrane was inserted in the palatal region of the surgical cavity, filling it with collagen sponges and the vestibular surface covered with a collagen membrane. The suture was performed with simple stitches and a vertical hook. After clinical and radiographic control, it was possible to observe, respectively, the absence of clinical signs and excellent healing pattern. Histopathological examination showed it to be a periapical cyst. With this, it can be concluded that in cases of extensive lesions, with persistent lesions, endodontic surgery is a viable option for solving cases with the presence of periapical cyst and histopathological biopsy should be performed to confirm the clinical diagnosis.

Keywords: Apicoectomy; Retrograde Obturation; Root Canal Treatment.

CASE REPORT

ID: 190/1042-0
REGENERATIVE ENDODONTIC TREATMENT OF DENS-IN-TOOTH WITH PULP NECROSIS AND INCOMPLETE RHIZOGENESIS: 6 MONTHS OF FOLLOW-UP

WESLEY MISAEL KRABBE, LEONARDO THOMASI JAHNKE, MARCUS VINÍCIUS REIS SÓ E RICARDO ABREU DA ROSA*

This work aims to report a clinical case of pulpal revascularization in an immature permanent tooth with developmental anomaly, associated with a periapical lesion. 8-year-old boy, history of trauma, referred for endodontics of tooth 22 with dens in dente diagnosed with chronic periapical abscess after clinical and radiographic examinations. The proposed treatment was filling the dens in dente with bioceramic material and, in the main canal, performing pulp revascularization. In the first consultation, anesthesia, absolute isolation and coronary opening were performed. Then, disinfectant penetration (2% chlorhexidine gel - CHX) and odontometry. Dens in dente was prepared with instrument #40.06. The main channel was sanitized with CHX activated by an ultrasonic insert (Clearsonic). Final irrigation was performed with 17% EDTA and saline solution. Calcium hydroxide was used as an intracanal medication and the tooth was provisionally restored with glass ionomer. After 15 days, the patient returned without signs and symptoms of infection. Anesthesia (3% mepivacaine without vasoconstrictor), absolute isolation and removal of the provisional restoration were performed. New disinfection using activated CHX with ultrasonic insert (Irrisonic). Final irrigation was performed with 17% EDTA and saline solution. The dens in dente were filled with BioRoot RCS cement and bleeding was induced with a #35 K-file 2mm

beyond the root apex into the main canal. After clot formation, a plug was made with Bio-C Repair cement and the tooth was restored with composite resin. At the 6-month follow-up, the radiographic image demonstrates remission of the lesion, normal apical periodontal space, and closure of the foramen. Teeth with developmental anomalies may require complex approaches to endodontic infection control.

Keywords: Regenerative Endodontics, Dental Trauma, Bioceramic

CASE REPORT

ID: 190/1043-0
DENS IN DENTE: ENDODONTIC INTERVENTION OF TYPE III AMELODENTINARY INVAGINATION – CASE REPORT

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The Lateral Incisor presents in most cases a single root, some cases in the literature reported two roots, however, studies have described cases of dental anomalies linked to this tooth. The invaginated tooth, dens invaginatus or dens in dente, is an embryological anomaly, resulting from the invagination of a developing amelodentinal structure into the crown or root.
The diagnosis of this anomaly usually occurs during a routine consultation, with evidence of a change in shape on the palatal surface, featuring an indentation; and also, complementary exams, from periapical x-rays to three-dimensional images of cone beam computed tomography. Therefore, the sooner the treatment of cases with a complex root canal system begins, more visible a conservative prognosis will be.
This dental anomaly is found mainly in the upper lateral incisors (75%), resulting in a view of the inner cavity of the tooth coated with enamel.
Due to having several classifications, the most used for this type (Oehlers, 1957) divides the dental anomaly into 3 types:
• type I: invagination is limited to the enamel;
• type II. extends apically to the JCE (Dentin-Enamel Junction) but remains confined to the root.
• type III extends apically to the JCE junction, but the communication with the pulp normally does not occur. Also, 1 apical foramen is present.
The objective is to report the case of a 19-year-old patient who came with painful pain in another tooth and who was treated, however he was also diagnosed, and soon was started the treatment of tooth 22, which is the subject of the present study.

Keywords: Dens In Dente, CBCT, Magnification

CASE REPORT

ID: 190/1044-0
HELP OF HIGH-DEFINITION TOMOGRAPHY AND MAGNIFICATION IN COMPLEX CASES OF ENDODONTICS - CASE REPORT

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The maxillary first molar is a tooth that presents great morphological variation, being that, in Brazil the incidence of the mesio buccal canal 2 is 82.4% (MARTINS, et.al.,2018). This reflects in a higher rate of clinical failure. The advantage of tomography and magnification in endodontics are an important aid in the resolution of complex cases. The aim of this study is to report a clinical case showing the advantage of tomography locating a root canal that is difficult to visualize. A 25-years-old patient came to the office reporting constant pain in the tooth 16, answering positively to percussion tests, inconclusive tomographic exam, with suggestive image of the presence of a supposed mv2 root canal not yet treated, reason why the symptomatology was still present. A new tomography with superior quality (x800 morita) was performed and the presence of the same was observed, being atresic and with calcified embouchure. With the assistance of microscopy, wear was performed with ultrasound and Finder tip, shaping, disinfection and obturation from this root canal. Achieving successful treatment. It is concluded that after the treatment performed the use of tomography and image magnification are indispensable for all cases as the reported.

Keywords: Tomography, Magnification, Root Canal.

SCIENTIFIC RESEARCH

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EVALUATION OF REPRODUCIBILITY OF CANAL CURVATURE MEASUREMENT METHODS

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Root curvatures (RC) represent one of the major difficulties in performing endodontic treatment. Accurately assessing the curvature angle of the canals is a preponderant factor in determining the complexity of treatments. However, there is no consensus on the method to be used. The objective of this study is to compare two different CR evaluation methods, analyzing their degrees of reproducibility. Ten students, in the last year of the Dentistry Course at PUCRS, were invited to participate in

the study and are evaluating the RC, through two methods (Schneider and Pettiette), in radiographs of 40 extracted human lower molars. The measurements, with both methods, were performed using the ImageJ software in two different periods. After the conclusion of the evaluations, the degree of Inter- and Intra-examiner reproducibility of each method was compared, using the Intraclass Correlation Index (ICC) calculation. Partial results demonstrate that the degree of reproducibility of the Pettiette method (0.82) is good and higher than that of Schneider (0.64). This result corroborates the hypothesis that, perhaps, the Schneider method should not be the first choice for measuring root curvature.

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INFLUENCE OF STORAGE TEMPERATURE ON THE FLOW, DIMENSIONAL CHANGE, SOLUBILITY AND PH OF ENDODONTIC SEALERS

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The aim of this study was to investigate the influence of three different storage temperatures on the flow, dimensional change, solubility, and pH of four endodontic sealers. The sealers BioRoot RCS, Endomethasone N, Bio-C Sealer, and AH Plus Jet remained for 30 days at controlled temperatures of 5ºC, 20ºC, or 35ºC. The flow test was based on ISO 6876 (2012) standards. The pH evaluation was carried out by analyzing the water, in which each disc used in the solubility test was individually immersed. Except for flow, the other properties were evaluated after 24h, 7d, 14d and 30d. Statistical analysis was performed using Kruskal-Wallis and Dunn's post hoc tests ($p = 0.05$) for comparison between storage conditions and Friedman's ANOVA and post hoc of Durbin-Conover ($p = 0.05$) for comparison between evaluation times. Regarding flow, only AH Plus Jet showed a statistically significant difference between storage temperatures, with lower flow when stored at 5ºC (14.6 mm) ($p = 0.0273$). All the tested sealers showed, at least at one of the investigated points, expansion beyond the recommended by ISO 6876 (2002). In terms of solubility, despite the statistical difference between storage temperatures ($p < 0.05$), all sealers remained within the maximum of 3% mass loss recommended by ISO 6876 (2012). The bioceramic sealers showed high pH values, regardless of the storage temperature. The different storage temperatures influenced the dimensional change, solubility, and pH of BioRoot RCS, Endomethasone N, Bio-C Sealer and AH Plus Jet cements. Furthermore, the flow of AH Plus Jet cement was influenced when storage at 5ºC.

Keywords: Endodontic Sealers, Physical-Chemical Properties