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Postoperative Pain and Incidence of Extrusion Following the Use of Two Intra-Canal Medications in Retreatment of Single Rooted Teeth A Prospective Clinical Trial

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KEYWORDS

Postoperative pain, Flare up, Apical extrusion, Endodontic retreatment, Bioceramic based intracanal medicament.

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ABSTRACT

Aim: Compare the postoperative pain intensity and flare up and extrusion incidence of two intracanal medications in retreatment of single rooted teeth in a double blinded prospective clinical trial. Subjects and methods: Thirty healthy patients; diagnosed with asymptomatic apical periodontitis; equally and randomly divided into two groups according to the applied intracanal medication (Metapex (MP) group and Bio-C Temp (BC) group) after complete removal of the old obturation material. Postoperative Pain intensity were documented on visual analog scale (VAS) 12 hours then every 24h for 7 days. Incidence of apical extrusion and flare ups were also recorded. Results: All pairwise comparisons between time points intragroup were significant at p value \leq (0.004), demonstrating a clear pattern of progressive pain reduction over the observation period. However, intergroup comparison at any of the measured time points and flare up incidence showed no significance. MP group showed significantly higher extrusion rate than did BC group with p value = (0.005). In the MP group, 8 participants (53.3%) experienced extrusion compared to only 1 participant (6.7%) in the BT group. Conclusion: Bioceramic based intracanal medicament is as effective and safe as calcium hydroxide in reducing postoperative pain and flare up incidence in retreatment cases. However, it is significantly lower regarding extrusion incidence.

INTRODUCTION

Postoperative pain is a common clinical complication that occurs during or after root canal treatment ⁽¹⁾. The aim of endodontic treatment is to provide optimum biological outcome and prevent pain during endodontic procedures and following the treatment ⁽²⁾. Postoperative pain is a multifactorial event; as many factors affect its occurrence such as preoperative pain, gender and age, systemic disease, presence of apical periodontitis, endodontic procedure itself, type of irrigation used and type of intra-canal medications.⁽³⁾

The frequency of flare up occurrence has been reported in many studies; in comparison to primary treatment cases flare ups are more prominent in cases of retreatment. Many studies have agreed that the most dominant cause of postoperative pain is microorganisms that persist with in the root canal space. $^{(4, 5, 6)}$

Persistent or secondary intra-radicular infection give rise to an inflammatory disorder of the periapical tissues; post-treatment apical periodontitis.^(7,8) Unlike primary root canal infections; microbial flora retrieved from unsuccessful root canal treatments are differs. Enterococcus faecalis plays a major role in persistent periradicular infections while, there presence is not significant in primary infection.⁽⁹⁾ Persistent infection is the microorganism that survives after obturation. However, secondary infection is microorganism that is introduced through coronal and/ or apical leakage in to root canals (10) Therefore, in retreatment cases, although the bulk of microorganisms are eliminated mainly through chemo-mechanical preparation, intracanal medication may help reaching this aim more effectively. ^(11, 12)

Many methods have been advocated for treating post-treatment apical periodontitis including; endodontic retreatment, decompression therapy, using intracanal dressing, aspiration – irrigation technique and active nonsurgical decompression technique. These non-surgical endodontic approaches for managing large periapical radiolucency are, in most cases, more feasible due to the less tissue trauma and more patient acceptance. Periapical tissues have remarkable regenerative potential, once the causative factor is removed the tissues tend to recover. ^(13, 14)

One of the well-known intracanal dressings is Metapex; which is a paste combining calcium hydroxide and 38% iodoform in an oily vehicle; a combination that has proven to boost the antimicrobial efficacy of calcium hydroxide against Enterococcus faecalis and other bacteria.⁽¹⁵⁾ The paste high PH has destructive effects on cell membrane and protein structure of microorganisms. ⁽¹⁶⁾ It is provided syringe with disposable tips. Calcium hydroxide as the main component of the paste not only acts as a bactericidal material but promotes healing and repair moreover; the high pH stimulates fibroblasts. ^(17, 18)

Another more recent intracanal medication; Bio-C Temp; calcium silicate based paste. This formula is a unique type of bioceramic based material which is biocompatible, antimicrobial and possesses bioactive properties . Unlike conventional calcium silicate-based endodontic materials it does not solidify within the root canal. ⁽¹⁹⁾

The null hypothesis is that there is no difference between the two tested intracanal medications in regards to postoperative pain, flare up and extrusion incidence.

AIM OF THE STUDY

Compares the postoperative pain and incidence of extrusion and flare up of two intracanal medications in retreatment of single rooted teeth.

PARTICIPANTS AND METHOD

Ethical regulations: The current prospective randomized clinical trial was a double blinded two grouped parallel armed study design with ratio 1: 1 and following the CONSORT guideline for clinical trials Fig (1) and adhered to the rules settings of medical protocol and ethics of Declaration of Helsinki. The research protocol was granted clearance by research ethic committee under ID number (144/ 1026) and registered in the Clinical Trials.gov database with ID (NCT06913673). All participants provided a written informed consent.

Sample size calculation

Applying a power analysis; using G Power version 3.1.9.7; to the null hypothesis that no difference would be shown regarding postoperative pain when using either of the tested intracanal medications based on former study ⁽²⁰⁾; at an alpha level of (0.05), the power=80% and a critical (z) value of (1.96). The sample size(n) was calculated to be 26 cases; which was raised to 30 to consider the potential dropouts (i.e., 15 cases per group).





Fig. (1) Flow chart sample selection, treatment and analysis following CONSORT

Selection of participants and Recruitment strategy:

Patients were selected from those referred to the outpatient clinics- Faculty of Dentistry- Minia University. Consecutive sampling was established until the target population was achieved. Thirty patients were included according to the following eligibility criteria:

The inclusion criteria:

- 1. Healthy patients (Class I category ASA) with no gender predilection and 18 to 40 years in age.
- 2. Patients having endodontic treated permanent mature single rooted; single canaled teeth that need retreatment.
- 3. Patients who agree to (participate and abide) with the study and are able to use VAS.

The exclusion criteria:

- 1. Patients with systemic diseases.
- 2. Immuno-compromised patients.

- 3. Pregnant women and smokers.
- 4. Teeth with root fractures or perforations
- 5. Un-restorable teeth (have excessive loss of coronal structure) or advanced periodontal disease.
- 6. Presence of adjacent teeth needing root canal treatment that may cause pain disturbing accurate postoperative pain records.
- 7. Teeth that develop complications during removal of the previous obturation material.

Randomization, blinding and grouping of participants:

A random sequence was generated by computer software (Microsoft Excel) where all groups (MP, BT); according to the medication used; were denoted and equally and randomly distributed. Simple envelope selection was applied to assign each participant to one of the test groups. A double blinding was preformed where the patients were

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blinded as well as the radiologist who assessed extrusion of the intracanal medication.

The participants were randomly divided into two equal groups according to the intracanal medicament applied following previous root canal filling material removal: group MP (n=15 patients); Metapex (META Biomed Co. Lt., Korea) application and group BT (n= 15 patients), Bio-c Temp (BIO; Angelus, Brazil) application

Treatment procedure 1st visit:

All retreatment procedures were performed by the same endodontist in a two visit root canal retreatment. All radiographs were established using size 2 Vatech HD intra-oral digital x-ray sensor (VATECH Co., Ltd., Korea) in a standard paralleling technique. A report form for each case was recorded including: pain on palpation, pain with percussion, presence of a fistula, previous restoration condition, presence of mobility and periodontal probing. Following local anesthesia (ARTINIBSA 40; S.L.U. Ctra., Spain) administration and establishing rubber dam isolation; coronal restorations and any carious lesions were removed and coronal build up was performed. A conventional access cavity was established and previous obturation material was removed using retreatment files Protaper Universal system (Dentsply Maillefer, Ballaigues, Switzerland) in crown down technique; 300 rpm and torque of 3Ncm; until working length was reached in sequence; D1for coronal third, D2 for coronal two thirds of the root canal and finally D3 to full working length. Apical patency was confirmed with a stainless-steel ISO size 10 K file. Working length was determined using Root ZX mini electronic apex locater (J Morita, Tokyo, Japan) and periapical radiograph confirmed total elimination of the obturation material.

Shaping procedure was completed using Pro Taper Next® (Dentsply Maillefer, Ballaigues, Switzerland) rotary files mounted on a torque controlled endodontic motor (NSK Endo-mate TC2, NSK, Japan), in a continuous rotation motion, X1, X2, X3 respectively, while torque and speed were adjusted according to manufacturer instructions. For larger canals; X4 and X5 files were used. three ml of 2.5 % sodium hypochlorite was used in between each file with a 27-gauge irrigation needle (Endo Eze, ultradent, USA); Following completion of the preparation 3 ml of 17% EDTA for each canal was done and a final flush of 10 ml of sterile distilled water.

Intracanal medicament application:

Following complete dryness with paper point of the corresponding size of the root canal the medicament was applied as following: **Group MP**: the tip of the Metapex syringe was placed 2mm short of the working length and gradually withdraw to obtain complete filling of the canal up to the cemento-enamel junction. **Group BT**: the tip of the Bio-C Temp syringe was placed 2mm short of the working length and gradually withdraw to obtain complete filling of the canal up to the cementoenamel junction.

Root canal orifice was sealed off with sterile teflon tape and the access cavity filled using resin reinforced glass ionomer (Riva, SDI, Germany) for 1 week.

Root canal obturation 2nd visit:

At the second visit, after ensuring the teeth were symptom free. The coronal filling and Teflon were removed as well as the intracanal medication all in the same procedure with 2.5% NaOCl irrigation and ultrasonic activation using size 25 woodpecker NITI K-File fixed to woodpecker ultrasonic scaler (Guilin Woodpecker Medical Instrument Co., Ltd., China). An appropriate sized master cone gutta-percha (META Biomed Co. Lt., Korea) was selected and obturation was established with cold lateral condensation using Adseal resin sealer (META Biomed Co. Lt., Korea). A postoperative



radiograph was obtained to ensure adequate filling. The access cavities were filled appropriately using Filtek Z350XT composite (3M ESPE; Germany).

Outcome assessment

- Post-operative pain assessment: pain score was recorded on a visual analogue scale (VAS) at (12, 24, 48, 72 hours and 7 days) after medication placement. Using a 0 to 10 points to record pain intensity. Patients were educated before treatment how to record their own pain status on the scale and directed to record the score at each period interval. Patients were also directed to make contact when unbearable pain is experienced and an emergency appointment was arranged and 400mg ibuprofen (Brufen, Abbott Laboratories, USA) was prescribed to be used every 8 hours for 3 days
- Extrusion assessment: A periapical radiograph was obtained in a standard paralleling technique with same parameters as the preoperative radiograph and the results were recorded as (yes or no) via a separate radiologist who was blinded to the type of medicament used.
- 3. Flare up assessment: following first visit; removal of previous endodontic treatment and placement of either intracanal medication; patients were instructed to call the clinic if severe pain and/or swelling was experienced and the case was recorded as a flare-up event. The result for this outcome was recorded as (yes or no).

Data collection and statistical analysis

The collected data were entered electronically in tables. Participant files and records were stored securely. Statistical analysis was performed using a commercially available software program (SPSS Chicago, IL, USA).

Declaration of interests: The study is selffunded and there is no conflict of interest to declare.

RESULTS

Forty-one patients were considered for the study; 11 cases were excluded as shown in Fig. (1). A total of 30 patients were included; regarding gender distribution; the MP group consisted of 5 males (33.3%) and 10 females (66.7%), while the BT group included 4 males (26.7%) and 11 females (73.3%). Comparison of demographic data between the MP and BT groups, each containing 15 participants. The mean age in the MP group was 30.1±6.1 years, while in the BT group it was 28.1±6.0 years. Independent Samples T-test recorded no significant difference between the two groups with p value = (0.389); indicating that both groups were comparable in terms of age distribution. The Chi-square test demonstrated no significant difference regarding gender distribution between the groups at p value = (0.960). These findings demonstrate that the two groups were well-matched on key demographic variables. Tab (1)

Table (1) Demographic data between the MP groupand BT group.

| | | MP group | BT group | Dualua |
|--------|----------------|-----------------------|-----------------------|---------|
| | | N=15 | N=15 | P value |
| Age | $Mean \pm SD$ | 30.1±6.1 | 28.1±6 | 0.389 |
| Gender | Male Female | 5(33.3%) 10(66.7%) | 4(26.7%) 11(73.3%) | 0.960 |

 Independent Samples T test for normally distributed quantitative data between the two groups

- Chi square test for qualitative data between the two groups.
- Significant level at P value < 0.05

A comprehensive analysis of Visual Analog Scale (VAS) pain scores between the MP (Metapex) and BT (Bio-c Temp) groups across multiple time points (12 hours, 24 hours, 48 hours, 72 hours, and 7 days) as shown in Tab (); demonstrated within each group, pain scores showed a consistent and statistically significant decrease over time (p<0.001 for both groups). The median VAS scores in both groups started at 5 at 12 hours, decreased to 3 at 24 hours, further reduced to 2 at 48 hours, 1 at 72 hours, and reached 0 at 7 days. All pairwise comparisons

between time points within each group were statistically significant ($p \le 0.004$), demonstrating a clear pattern of progressive pain reduction over the observation period.

Interestingly, there were no statistically significant differences in VAS scores between the two groups at any of the measured time points (all p-values > 0.05), suggesting that both interventions provided similar pain relief profiles. Tab.(2), Fig. (2)

| Table (2) Comparison of VAS score between the Magnetic | 1P |
|--------------------------------------------------------|----|
| group and BT group at different times. | |

| | | MP group | BT group | Р |
|---------------------------------|---------------|------------|-------------|-------|
| | | N=15 | N=15 | value |
| VAS 12H | Median IQR | 5 (4-7) | 5 (4-6) | 0.203 |
| VAS 24H | Median IQR | 3 (3-5) | 3 (3-5) | 0.624 |
| VAS 48H | Median IQR | 2 (2-3) | 2 (1-3) | 0.846 |
| VAS 72H | Median IQR | 1 (0-2) | 1 (0-2) | 1 |
| VAS 7 D | Median IQR | 0 (0-1) | 0 (0-1) | 0.553 |
| P value between different times | | <0.001* | <0.001* | |
| 12 hr. vs 24 | 4 hr. | 0.001* | 0.001* | |
| 12 hr. vs 48 hr. | | 0.001* | 0.001* | |
| 12 hr. vs 72 hr. | | 0.001* | 0.001* | |
| 12 hr. vs 7 days | | 0.001* | 0.001* | |
| 24 hr. vs 48 hr. | | 0.001* | 0.001* | |
| 24 hr. vs 72 hr. | | 0.001* | 0.001* | |
| 24 hr. vs 7 days | | 0.001* | 0.001* | |
| 48 hr. vs 72 hr. | | 0.001* | 0.001* | |
| 48 hr. vs 7 days | | 0.001* | 0.001* | |
| 72 hr. vs 7 days | | 0.004* | 0.004* | |

- Mann Witney test for not normally distributed quantitative data between the two groups
- Friedman test for not normally distributed quantitative data between all times within each group
- Wilcoxon Signed Rank test for not normally distributed quantitative data between each two times within each group
- *: Significant level at P value < 0.05



Fig. (2) Box plot showing comparison of VAS score between MP group and BT group at different time intervals

Regarding extrusion incidence between the MP and BT groups. A statistically significant difference in extrusion rates between the tested groups at p value 0.005. In the MP group, 8 participants (53.3%) experienced extrusion compared to only 1 participant (6.7%) in the BT group. This substantial difference suggests that the BT approach is significantly more effective at preventing extrusion.

Concerning flare-ups incidence 2 participants (13.3%) in the MP group experienced this complication; it is worth noting that those 2 patients experienced the highest pain scores and showed intracanal medication extrusion, while no participants (0%) in the BT group had flare-ups. However, this did not attain significance with p value of (0.143), the small sample size possibly may have attributed to this in addition to the low overall incidence of flare-ups. Despite the lack of statistical significance for flareups, the numerical trend favors the BT Group for both outcome measures, suggesting potential clinical advantages of the BT approach in reducing complications. Tab. (3), Fig. (3)



Table (3) Comparison of extrusion and flare up between the two groups.

| | | MP group | BT group | Davalara |
|-----------|-----------|-----------------------|----------------------|----------|
| | | N=15 | N=15 | P value |
| Extrusion | No Yes | 7(46.7%) 8(53.3%) | 14(93.3%) 1(6.7%) | 0.005* |
| Flare up | No Yes | 13(86.7%) 2(13.3%) | 15(100%) 0(0%) | 0.143 |

Chi square test for qualitative data between the two groups.

*: Significant level at P value < 0.05



Fig. (3) Bar chart showing comparison of extrusion and flare up incidence between the MPgroup and BT group.

DISCUSSION

Post-treatment apical periodontitis is consistently linked to the presence of microorganisms in the root canal. The microbiota of infected root canals is predominantly facultative anaerobic microorganisms. Control of the local infectious process during retreatment favors healing of the apical and periapical region which is critical to successful endodontic treatment.⁽¹⁾

Unfortunately, retreatment is associated with postoperative pain which is closely related to microorganisms which survive with in the root canal system. Elimination of microbes is easier said than done especially in retreatment cases which is attributed to remnants of previous obturation material. Subsequently, this results in higher flare-up frequency in retreatment cases compared to patients undergoing primary root canal treatment. ^(3,5,6)

Thus, placing intracanal medicaments into root canal space after a careful chemo-mechanical preparation and removal of the previous filling material improves disinfection of the root canal system in retreatment cases and minimize risks of postoperative pain. ^(11, 12)

In the present study premixed intracanal medicament was used in both groups which reduces the potential risk of heterogeneity that may result from manual mixing. Undoubtedly, the correct proportioning and mixing of the material provides the optimum material properties. A premixed material is also easy and quick to use. ^(21, 22)

Limited number of clinical trials have examined the influence of placing intracanal medicaments on postoperative pain, extrusion and flare-up incidence in endodontic retreatment. Thus, for the current study was designed to compare the effect of Metapex and Bio-C Temp intracanal medicaments on postoperative pain, extrusion and flare-up incidence in retreatment. A double blinded model was utilized preventing bias to any of the two test groups

Visual Analogue Scale (VAS) was selected to record pain score which is considered to be a valid and reliable ratio scale for measurement of pain. Extreme care was taken to rule out preoperative factors that might result in postoperative pain. ⁽²³⁾ Only asymptomatic teeth were selected, since preoperative pain predisposes retreatment cases to postoperative pain. Only single-rooted teeth were included to minimize the risk of iatrogenic errors. Furthermore, only patients without other pain source that could interfere with pain resulting from endodontic therapy. Patients with multiple problematic teeth that required treatment were excluded to eliminate the possibility of referred pain. ⁽³⁾

Regarding postoperative pain within the same group; a consistent and statistically significant decrease over time. The median VAS scores in both groups started at 5 at 12 hours, decreased to 3 at 24 hours, further reduced to 2 at 48 hours, 1 at 72 hours, and reached 0 at 7 days, demonstrating a clear pattern of progressive pain reduction over the observation period.

The initial pain with in the first 24 hours is a common occurrence in retreatment cases and has been reported by many researches.^(4,5,6) Yoldas **etal;**⁽²⁴⁾ demonstrated that postoperative pain with in the first 24 hours was the highest. Further elaborating that 2 visit technique using intracanal medication between the two visits recorded significantly less postoperative pain than single visit technique. Further **Comparin etal;**⁽²⁵⁾ who found that significantly more intense pain was recorded by patients after 24 hours up to 48 hours after the removal of the previous root filling material and application of an intracanal medication.

This can be due to many causes **Seltzer and Naidorf**⁽¹⁾ have attributed it to local adaptation syndrome, extrusion of debris, extrusion of irrigation solutions, changes in the pressure of periapical tissues, microorganisms, host factors and psychological factors.

Comparing both groups no significant difference was found and a clear pattern of progressive pain reduction over the observation period. Fortyeight hours following application of intracanal medications only mild pain was observed which declined to no pain by day seven; giving an indication that the intracanal medications used in both groups had pain relieving effect. These results come in agreement with **Omaia et al.**⁽²⁶⁾ and **El Abbasy et al.**⁽²⁷⁾ who demonstrated the positive effect regarding pain relief when Metapex was used as intracanal medication.

Metapex, is a well-known intracanal dressing composed of calcium hydroxide paste combined

with 38% iodoform in a silicone oil based vehicle. This combination has been shown effective in killing Enterococcus feacalis. The antimicrobial efficacy of calcium hydroxide is directly linked to its high pH of 12.5 which has been demonstrated to possess destructive effect on the cell membranes and protein structures of microorganisms.⁽²⁸⁾

Soares et al.⁽²⁹⁾ has attributed the Metapex's relief of pain to its ability to eliminate micro-organisms and promotes repair through multiple physiologic processes; controlling the inflammatory process, neutralizing osteoclasts activity, inducing cellular differentiation via activation of both alkaline phosphatase and adenosine triphosphates finally by neutralization of exotoxins.

Many researchers have further explained the antibacterial action of Metapex on microorganisms owing it to the high pH which negatively affects bacterial growth, metabolism and bacterial cell division. Hydroxyl ions have the ability to attack cytoplasmic membrane which is essential for many cellular functions as metabolism, cellular division, cell growth, cellular wall formation, electron transport and oxidative phosphorylation. ^(30, 31, 32)

Cwikla etal⁽³³⁾ pointed out the superior antimicrobial efficacy of Metapex that is a result of the combination of calcium hydroxide and iodoform which may prolong the action of the medicament and enhances the antimicrobial effects specially against E. faecalis. The powerful germicidal properties of iodoform have been confirmed in many studies.⁽³⁴⁾ Iodine not only is bactericidal but is also fungicidal. As the antimicrobial activity takes place the periapical tissues are provided with an environment that encourages accelerated healing and decrease in inflammatory mediators leading to pain relief.⁽³⁵⁾

Likewise, Bio-C Temp showed moderate pain score the first 24 hours which rapidly declined with total relief of postoperative pain at day seven; this comes in agreement with **Mohammadi etal** ⁽¹⁸⁾ who showed that calcium silicate paste has antimicrobial



potential and bioactivity potentially contributing in postoperative pain relief.

This can be explained by the high and stable alkalinity of Bio-C Temp responsible not only for the antibacterial activity but the induction of repair, remineralization and neutralizing lactic acid all of which eventually lead to relief of pain. The main component of Bio-C Temp is calcium Silicates once hydrated is gives off calcium hydroxide that dissociates into calcium and hydroxyl ions. The released (OH-) is responsible for the significant increase in the pH value in root canal space and periapical tissues, creating an unsuitable environment for bacterial growth.⁽³⁶⁾ In a comparative study **Delfino etal** ⁽³⁷⁾, they came to conclude that the Bio-C Temp, not only provides a high pH value but also had the ability to maintain and even increase over the period.

Despite the lack of statistical significance for flare-ups, the numerical trend favors the BT Group for this outcome, suggesting potential clinical advantages of the BT approach in reducing complications. This may be due to the prolonged and stable release of Ca2+ ions that have many favorable effects on the surrounding tissues modulating inflammatory reactions and enhancing regeneration and repair. ⁽³⁸⁾

Moreover, once the hydroxyl ions are released the pH stability of the bacterial cell membrane is altered negatively by chemical injury the integrity of the cytoplasmic membrane is damaged which subsequently affects all the cell membrane functions leading to microbial cell death. ^(18, 39)

In a study by **Guerreiro etal** ⁽¹⁹⁾ Bio-C Temp was tested for cyto-compatibility and the effect on the biology of the human osteoblast-like. The authors found that Bio-C Temp had similar cytocompatibility to calcium hydroxide intracanal medicament while showing higher induction of ALP activity and deposition of mineralized nodules than calcium hydroxide giving an indication that it would allow accelerated healing; this may explain the significant relief of pain at the 48-hour point.

Regarding results of intracanal medicament extrusion a statistically significant difference in extrusion rates between the two test groups at p =(0.005). In the MP group, 8 participants (53.3%) experienced extrusion compared to only 1 participant (6.7%) in the BT group. This substantial difference suggests that the BT approach is significantly more effective at preventing extrusion. Our results are in agreement with **Subramaniam and Gilhotra**⁽⁴⁰⁾ whom found that Metapex had a 20% extrusion. They contributed the high extrusion rate with the thin consistency of the premixed paste.

Further, in accordance with **Ali etal** ⁽⁴¹⁾ who studied the effect of combining Absorbable Gelatin Sponge (AGS) and Colla cote as a biological barrier with Metapex to confine it to root canal space. The authors found that when using Metapex alone all cases showed apical extrusion of the material. They came to conclude that this is due to the extremely low viscosity that the clinician cannot control or/ and due to thick and inflexible plastic tips of the commercially available pastes which persuades the operator to apply more pressure on the syringe consequently causing apical extrusion of the material.

The present randomized clinical trial comparing postoperative pain, apical extrusion, flare up incidence of two intracanal medicament the null hypothesis was partially rejected; regarding postoperative pain and flare up incidence no significant difference was shown while for intracanal medication apical extrusion MT group showed significant higher extrusion rate.

CONCLUSION

Bioceramic based intracanal medicament is as effective and safe as calcium hydroxide in reducing postoperative pain and flare up incidence in retreatment cases. However, it is significantly lower regarding extrusion incidence.

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النشر الرسمي لكلية طب الأسنان جامعة الأزهر أسيوط مصر





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الألم بعد الجراحة ومعدل حدوث بروز الأسنان بعد استخدام دواءين داخل القناة لعلاج الأسنان ذات الجذر الواحد تجربة سريرية مستقبلية

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الملخص :

الهدف: مقارنة شدة الألم بعد الجراحة ومعدلات اشتعاله ومعدل بروز الأسنان لدواءين داخل القناة في علاج الأسنان ذات الجذر الواحد في بجربة سريرية مستقبلية مزدوجة التعمية.

المواد والاستاليب: ثلاثون مريضًا سليمًا: شُخِّصوا بالتهاب دواعم السن القمي بدون أعراض: قُسِّموا بالتساوي وبشكل عشوائي إلى مجموعتين وفقًا للدواء المُستخدم داخل القناة (مجموعة ميتابيكس (MP) ومجموعة بيو-سي تيمب (BC)) بعد الإزالة الكاملة لمادة الحشو القديمة. وُثِّقت شدة الألم بعد الجراحة على مقياس التناظر البصري (VAS) بعد 12 ساعة. ثم كل 24 ساعة لمدة 7 أيام. كما تم تسجيل معدل حدوث بروز قمة السن ونوبات الاشتعال.

النتائج: كانت جميع المقارنات الزوجية بين نقاط زمنية داخل الجموعة ذات دلالة إحصائية عند قيمة (0.004 ≥ P). ما يدل على وجود نمط واضح من انخفاض الألم التدريجي خلال فترة الملاحظة. ومع ذلك. فإن المقارنة بين الجموعات في أي من نقاط الوقت المقاسة ومعدل حدوث الاشتعال لم تظهر أي دلالة إحصائية. أظهرت مجموعة MP معدل بروز أعلى بكثير من مجموعة BC بقيمة (0.005 = P). في مجموعة MP. عاني 8 مشاركين (/53.3 من البروز مقارنة بشارك واحد فقط (/6.5) في مجموعة BT).

الخلاصة: الدواء داخل القناة القائم على السيراميك الحيوي فعال وآمن مثل هيدروكسيد الكالسيوم في تقليل الألم بعد الجراحة ومعدل حدوث الاشتعال في حالات إعادة العلاج. ومع ذلك، فهو أقل بكثير فيما يتعلق *ب*عدل حدوث البثق

الكلمات المفتاحية: ألم ما بعد الجراحة. الاشتعال، بروز قمة السن. إعادة العلاج اللبية، الدواء داخل القناة القائم على السيراميك الحيوي.