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Effect of Bioceramic Sealers on Post Endodontic Pain in Single Visit Endodontics: A Clinical Study.

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ABSTRACT

Background: Aim: to evaluate the effect of bioceramic sealers on post endodontic pain following single visit endodontics. **Methods:** Ninety patients requiring endodontic treatment were selected for the study. Patients were treated in single visit endodontically using three different bioceramic based sealers. **Results:** No significant difference was found in post endodontic pain scores between the sealers groups. **Conclusion:** Any of the three bioceramic sealer can be used for single visit endodontics without fear of post operative pain.

Keywords: Bioceramic sealers, single visit endodontics, heft parker pain scale.

INTRODUCTION

The evolution of newer techniques, instruments, materials and better understanding of canal anatomy, has changed the face of endodontics completely. One concepts that has emerged is the single visit root canal therapy. Single-visit root canal treatment has become a common practice and offers several advantages, including a reduced flare-up rate, decreased number of operative procedures and no risk of inter-appointment leakage through temporary restorations.[1]

The major consideration regarding one appointment endodontics has been the concern about post operative pain.[2] Various studies have evaluated the post endodontic pain difference between single and multiple visit rct, but most studies have ruled out any significant difference in post operative pain.[3] Lately bioceramic based sealers have been used in endodontics. They offer the advantage of being biocompatible and form hydroxyapatite crystals that help in bonding with root dentin. Therefore this study was undertaken to evaluate the effect of these sealers on post endodontic pain.

MATERIALS & METHODS

Ninety patients reporting to the department of conservative dentistry and endodontics for undergoing endodontic treatment in teeth with asymptomatic apical periodontitis were recruited for the study. The following inclusion and exclusion criteria were applied for patient selection for the study

Inclusion criteria

Permanent teeth with fully formed apex, teeth with vital pulp, teeth with no periapical radiolucency, patients having preoperative pain.

Exclusion criteria

Teeth with incompletely formed apex, teeth requiring secondary endodontic treatment, patients having complicating systemic disease such as diabetes, malignancy, pregnancy, central nervous system disorders, Cardiovascular system (CVS) disorders, respiratory disorders, asthma patients, psychiatric disorders, immunocompromised patients, patients taking anti-inflammatory or antibiotics, patients giving history of analgesic or antibiotic intake 1 week before treatment, patients below 18 years of age, patients above 65 years of age, patients having history of peptic ulcer or gastrointestinal bleeding, teeth having calcified canals, teeth having multiple canals or multirooted teeth, teeth affected with periodontal disease. Teeth tender on percussion, teeth having procedural errors such as transportation, perforation, and missed canals. Before starting the procedure Informed consent was obtained, and a clinical examination was administered. The examination included cold pulp testing, heat testing, electric testing, percussion and palpation evaluation, periodontal probing, mobility assessment, and a periapical radiograph. All past and present symptoms of the involved tooth were recorded pulpal diagnosis was determined from the data

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collected in the examination and was recorded. Only those patients with a diagnosis of symptomatic irreversible pulpitis with no apical periodontitis were included in the study.

Standard Endodontic procedure

Before treatment, the patient filled out his/her initial perception of pain on the heft parker pain scale Local anesthetic (1:80,000 Arcaine, Aarge Pvt Ltd., India) was administered, and endodontic access was achieved under rubber dam isolation. Cleaning and shaping of the canal systems were achieved in the following manner; early negotiation and cleaning and shaping was completed with Flex-O-Files (Maileffer Switzerland) #8, #10, #15, #20. An initial working length reading was taken with the apex locator root ZX mini (J Morita Japan) and a confirmatory radiograph was taken. The working length was estimated to be 0.5 mm short of the radiographic apex. Canals were prepared using engine driven rotary nickel titanium pro taper gold files (Dentsply Maillefer, Ballaigues Switzerland) following manufacturer's instructions. RC prep (Premier Dental Products Co., Philidelphia, PA, USA) was used as a lubricant. Irrigation was performed with 5.25% sodium hypochlorite after each file change. Apical enlargement was accomplished with using finishing files which ranged from F1 to F5 depending upon the initial diameter of the canal. Then the patients were divide into three treatment groups for obturation.

Patients were randomly divided into three treatment groups depending upon sealer used:

Group1: obturation done using MTA plus (Prevest India Ltd) sealer

Group2: obturation done using Endosequence BC(Bressler USA) sealer

Group 3: I Root SP (Innovative Bioceramix, Inc Canada) sealer

All canals were then obturated using warm vertical compaction technique. All cases were completed in one appointment (access, cleaning and shaping, and obturation). Patients were then given the Heft and Parker [4] pain rating scale and were instructed to mark the individual pain level at 4, 8, 12, 24, and 48 h after root canal therapy.

Statistical analysis

Parametric data were analyzed with the help of means and standard deviations. Inter group analysis was carried out using the analysis of variances with "least significant difference" post hoc test. For intra group analysis, Student's t-test was used. Chi-square test was applied for nonparametric data. The value of $P < 0.05$ was considered

RESULTS

[Table 1] shows the gender distribution among groups. A total of 90 patients were included in the study. 46 males and 44 female patients participated in the study. No significant difference between the gender distributions was noted among groups. [Table 2] shows the mean age of patients among groups. Age ranged from 18 yrs to 65 yrs. No significant difference in mean age of patients was noted among groups. [Table 3] shows the mean pain scores among groups at various time intervals. A significant difference among mean pain score was noted among groups postoperatively as compared to preoperative pain scores. No significant difference was found between groups at various time intervals postoperatively [Table 4]

Table 1: Gender Distribution Among Groups

Group	Males %	Females %	P-
Group 1(N=30)	16(53.3)	14(46.7)	.965*
Group 2(N=30)	17(56.6)	13(43.4)	
Group 3(N=30)	13(43.4)	17(56.6)	

Non statistically significant difference

Table 2: Mean Age Of Patients Among Treatment Groups.

Groups	Mean Age Years	Range	P-value
Group 1(n=30)	34.4	18-60	.975*
Group 2(n=30)	35.6	22-63	
Group 3(n=30)	36.1	22-62	

Non-significant statistical difference

Table 3: Mean Pain Scores At Various Time Intervals

Groups	Preoperative	4hrs	8hr	12hr	24hr	48hr
Group 1	87.3	13.9	13.8	11.1	5.5	3.4
Group2	85.8	14.2	14.2	11.8	6.2	3.9
Group3	88.9	13.6	14.5	11.5	5.3	3.8

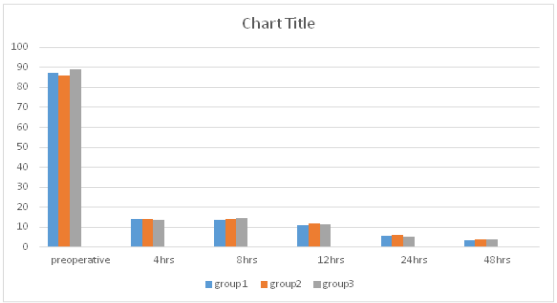

Figure 1: Graphical representation of Mean pain scores among treatment groups

Table 4: Intra Group Comparison Of Mean Pain Scores At Various Time Intervals

Groups	4hrs	8hrs	12hrs	24hrs	24hrs
Group 1 Vs Group 3	0.241	.345	.240	.184	.196
Group 2 Vs Group 3	.344	.234	.160	.184	.177
Group 1vs Group 2	.344	.322	.345	.211	.241

DISCUSSION

Though the accurate classification of pain and its measurement is essential, pain is a subjective feeling, which makes the precise definition of different discomfort categories and detailed description of pain difficult.[5,6] It is well known that pain perception is highly subjective and influenced by many factors, and the most effective method of pain evaluation is self-evaluation. Thus, results were based upon the patient's report of post-obturation pain. Heft parker pain rating scale was used as it is more accurate and commonly used scale for measuring pain. Results from the present study indicate that pain was significantly reduced in all the treatment groups postoperatively [Figure 3]. There was no significant difference between mean pain scores after the endodontic treatment over the evaluated 48 hrs period postoperatively. Regarding age group, only 25.7% of the oldest patients (n = 14) felt post-operative pain, a low percentage when compared to 40% of the youngest patients (n = 16). The highest pain intensity felt during the 48hrs evaluation was more frequently classified as slight pain, both for the oldest (20.0%, n = 13) and youngest patients (26.7%, n =1 4). Despite apparent differences, comparison between age groups revealed no statistically significant differences for highest pain intensity felt during the 48 hrs evaluation period. When considering tooth location, post-operative pain was felt by 33.3% (n = 40) of patients, in both categories. Although patients who treated teeth localized in the mandible showed a higher percentage of moderate pain (13.3% vs. 6.67%), it as compared to maxillary teeth similar to other studies.[7-9] The incidence of post obturation pain was more during the 1st 24 hrs after obturation. However, at 48hrs, post obturation pain decreased significantly which was found in agreement with the findings of other studies.[10-13] In 1st post obturation day as well as 2nd post obturation day females reported more pain than males. These results support findings of previous workers.[14,15] Female patients experienced more pain than male patients, a possible explanation is that biological differences between genders may explain increased pain prevalence in females.[15] In the present study warm vertical compaction was used as obturation technique. It is said that lateral condensation and warm vertical compaction have more probability of apical extrusion of the gutta-percha.[16] In this study, the root canals were prepared with Ni-Ti rotatory files. Arias., et al. in their prospective in vivo study suggested that a higher incidence of postoperative pain should be expected after manual root canal preparation.[17] The instrumentation that uses rotation seems to reduce significantly the amount of debris extruded apically when compared with the manual system (Reddy and Hicks, 1998) and bacteria which may worsen the inflammatory response and result in peri-radicular inflammation, a lower incidence of postoperative pain should be expected.[18]

In the study pain significantly decreased post operatively after endodontic treatment in all three groups. The use of different sealers did not make any significant difference in development of post operative pain suggesting that use of appropriate technique and limiting the preparation to within the apex has a greater role then the type of sealer used for obturation. Bio ceramic based sealers have been shown to cause less postoperative pain than other type of sealers. In case of bio ceramics, due to its wettability and viscosity, the bio ceramic could spread into any root canal irregularity and non-instrumented space. This sealer exhibits the formation of calcium hydroxide on hydration and thus would potentially promote bioactivity and adhesion to the canal wall through mineral tags.[19]

CONCLUSION

Within the limitations of the present study it was concluded that post operative pain was significantly reduced in single visit endodontics using bio ceramic sealers. No significant difference was found between the sealer groups. New studies can be done using different obturating techniques and sealers to evaluate their effect on post endodontic pain.

REFERENCES

1. Walton R, Fouad A. Endodontic interappointment flare-ups: A prospective study of incidence and related factors. J Endod 1992;18:172-7
2. Siqueira JF Jr., Rôças IN, Favieri A, Machado AG, Gahyva SM, Oliveira JC, et al. Incidence of postoperative pain after intracanal procedures based on an antimicrobial strategy. J Endod 2002; 28:457-60.
3. Fava LR. A comparison of one versus two appointment endodontic therapy in teeth with non-vital pulps. Int Endod J 1989; 22:179-83.
4. Heft MW, Parker SR. An experimental basis for revising the graphic rating scale for pain. Pain 1984; 19:153-61.
5. Soltanoff W. "A comparative study of the single-visit and the multiple-visit endodontic procedure". Journal of Endodontics 4.9 (1978): 278-281.
6. Mulhern J., et al. "Incidence of postoperative pain after one-appointment endodontic treatment of asymptomatic pulpal necrosis in single-rooted teeth". Journal of Endodontics 8.8 (1982): 370-375.
7. Segura –Egea J.J, Cisne ros-Cabello R, Liamas-Carreras J.M, Velasco-Ortega E. Pain associated with root canal treatment. International Endodontic Journal, 2009; 42:614-20.
8. Alcam T, Tinaz A.C, Interappointment emergencies in teeth with necrotic pulps. Journal of Endodontics, 2002; 28(5):375-77.
9. Kalhoro F.A, Mirza A.J. A study of Flare ups following single visit root canal treatment in Endodontic patients. Journal of the College of Physicians and Surgeons Pakistan, 2009;19(7):410-4123.
10. DiRenzo A, Gresla T, Johnson BR, Rogers M, Tucker D, BeGole EA, et al. Postoperative pain after 1- and 2-visit root canal therapy. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2002;93:605-10.

11. Fox J, Atkinson J.S, Dinin A.P, Greenfield E, Hechtman E, Reeman CA, et al. Incidence of pain following one visit Endodontic treatment. Oral surgery Oral Medicine and Oral Pathology, 1970;30:123-30.
12. Mulhern JM, Patterson SS, Newton CW, Ringel AM. Incidence of post operative pain after one appointment Endodontic treatment of asymptomatic pulpal necrosis in single rooted teeth. Journal of Endodontics, 1982;8:370-5.
13. Alcam T. Incidence of post operative pain following the use of different sealers in immediate root canal filling. Journal of Endodontics, 1985;11:135-7. 21. Koba K, Kimura Y, Matsumoto K, et al. Post operative symptoms and healing after Endodontic treatment of infected teeth using pulsed Nd: YAG Laser. Endodontics and Dental Traumatology, 1999;15:68-72
14. Albashaireh Z.S.M, Alnegrish A.S. Post obturation pain after single and multiple –visit endodontic therapy. A prospective study. Journal of Dentistry, 1998;26:227-32.
15. AL-Negrish A.R, Habahbeh R. Flare up rate related to root canal treatment of asymptomatic pulpally necrotic central incisor teeth in patients attending a military hospital. Journal of Dentistry, 2006;34(9):635-40
16. Pereira A., et al. "Single-cone obturation technique: a literature review". RSBO 9.4 (2012): 442-447.
17. Arias A., et al. "Prospective case controlled clinical study of post-endodontic pain after rotary root canal preparation performed by a single operator". Journal of Dentistry 43.3 (2015): 389-395.
18. Singla M., et al. "Comparative evaluation of rotary ProTaper, ProFile, and conventional stepback technique on reduction in Enterococcus faecalis colony-forming units and vertical root fracture resistance of root canals". Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics 109.3 (2010): e105-e110.
19. Camilleri J. "Sealers and warm gutta-percha obturation techniques". Journal of Endodontics 41.1 (2015): 72-78.

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