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A Study to Compare Various Sealers on Postoperative Pain in Single Visit Endodontics

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ABSTRACT

Background: The main objective of performing root canal therapy is to eliminate bacteria from the infected root canal system or remove inflamed pulp tissue and close it with a biologically acceptable filling material. The present study was conducted to evaluate the effect of bioceramic-based sealers on post-operative pain following single-visit endodontics. **Methods**: The present study was conducted among 40 patients undergoing endodontic treatment in teeth with asymptomatic apical periodontitis. A clinical examination was done. A local anesthetic was administered and endodontic access was achieved under rubber dam isolation. Cleaning and shaping of the canal systems were achieved. An initial working length reading was taken with the apex locator root a confirmatory radiograph was taken. Then, the patients were divided into two treatment groups for obturation. Patients were randomly divided into two treatment groups depending on the sealer used: Group 1 include Obturation done using MTA plus sealer and Group 2include iRoot SP sealer. Patients were then given the Heft and Parker8 Pain Rating Scale. Intergroup analysis was carried out using the analysis of variances with post hoc test. $P < 0.05$ was considered statistically significant. **Results**: In the present study total patients were 40 in which group 1 include 20 patients and group 2 include 20 patients. Table 2 shows mean pain score at different intervals. There was no significant difference found in postendodontic pain scores between the sealers groups. **Conclusion**: Our study concluded that there was no significant difference found in postendodontic pain scores between the sealers groups. So any of the sealer group can be used for single-visit endodontics without fear of postoperative pain.

Keywords: iRoot SP sealer, MTA plus sealer, vertical compaction.

INTRODUCTION

The goal of root canal therapy is thorough disinfection and obturation of the root canal system in all its dimensions.[1,2] The evolution of newer techniques, instruments, materials, and better understanding of canal anatomy, has changed the face of endodontics completely. One concept that has emerged is the single-visit root canal therapy. Single-visit root canal treatment (RCT) has become a common practice and offers several advantages, including a reduced flare-up rate, decreased number of operative procedures, and no risk of interappointment leakage through temporary restorations.[3] Management of necrotic teeth has always presented additional challenge since, the presence of necrotic tissues and bacteria can be pushed into periapical tissues,[4] thereby causing postoperative complications such as induction of inflammation and flare-up, and delay of periapical healing.[5-7] The present study was conducted to evaluate the effect of bioceramic-based sealers on post-operative pain following single-visit endodontics.

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MATERIALS AND METHODS

The present study was conducted among 40 patients undergoing endodontic treatment in teeth with asymptomatic apical periodontitis. Before the commencement of the study ethical approval was taken from the Ethical committee of the institution and informed consent was obtained from the patient. Patients with permanent teeth with fully formed apex, teeth with vital pulp, teeth with no periapical radiolucency, and patients having preoperative pain were included in the study. Teeth with incompletely formed apex, teeth requiring secondary endodontic treatment, patients having complicating systemic disease, patients taking anti-inflammatory or antibiotics, patients giving a history of analgesic or antibiotic intake 1 week before treatment,patients <18 years of age, patients

>60 years of age, teeth having calcified canals, teeth having multiple canals or multirooted teeth, and teeth affected with periodontal disease, and teeth having procedural errors such as transportation, perforation, and missed canals were excluded from the study. A clinical examination was done. The examination included cold pulp testing, heat testing, electric testing, percussion and palpation evaluation, periodontal probing, mobility assessment, and a periapical radiograph. A local anesthetic was administered and endodontic access was achieved under rubber dam isolation. Cleaning and shaping of the canal systems were achieved in the following manner; cleaning and shaping were completed with Flex-O-Files #8, #10, #15, #20. An initial working length reading was taken with the apex locator root ZX mini 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 ProTaper gold files following the manufacturer's instructions. RC prep 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 on the initial diameter of the canal. Then, the patients were divided into two treatment groups for obturation. Patients were randomly divided into two treatment groups depending on the sealer used:

Group 1: Obturation done using MTA plus sealer

Group 2: iRoot SP sealer.

All canals were then obturated using the warm vertical compaction technique. All cases were completed in one appointment. Patients were then given the Heft and Parker8 Pain Rating Scale and were instructed to mark the individual pain level at 4, 24, and 48 h after root canal therapy. Intergroup analysis was carried out using the analysis of variances with post hoc test. $P < 0.05$ was considered statistically significant.

RESULTS

Table 1: Distribution according to sealer

Group	N
Group 1: Obturation done using MTA plus sealer	20
Group 2: iRoot SP sealer	20
Total	40

Table 2: Mean pain scores at various time intervals

Groups	Preoperative	4h	24h	48h
Group 1	89.7	14.1	5.7	3.6
Group 2	90.6	13.8	5.4	3.9

In the present study total patients were 40 in which group 1 include 20 patients and group 2 include 20 patients. [Table 2] shows mean pain score at different intervals. There was no significant difference found in postendodontic pain scores between the sealers groups.

DISCUSSION

The main objective of the root canal treatment is to achieve meticulous debridement and adequate shaping of the root canal system with no or minimal amount of pain. However, extrusion of debris into the peri-radicular region during endodontic treatment results in post-operative pain and flare-ups.[9,10] In this study, Heft–Parker Pain Rating Scale was used as it is more accurate and commonly used scale for measuring pain. It is well known that postendodontic pain is reduced significantly following endodontic therapy. In case of single-visit endodontics, many clinical studies have reported varying degrees of postendodontic pain, ranging from 25% to 40%.[11,12]

According to a systematic review conducted by Pak and White shows a significant reduction in postinstrumentation pain when compared to preoperative pain was observed at all the time intervals, namely, 24 h, 48 h, 72 h, and 7 days. The greatest mean pain in all the three study groups occurred in the first 24 h, with a significant reduction in pain ratings at the subsequent observation time points of 48 h, 72 h, and 7 days.[13]

Bioceramic-based sealers have been shown to cause less postoperative pain than other type of sealers. In case of bioceramics, due to its wettability and viscosity, the bioceramic could spread into any root canal irregularity and noninstrumented 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.[14,15]

CONCLUSION

Our study concluded that there was no significant difference found in postendodontic pain scores between the sealers groups. So any of the sealer group can be used for single-visit endodontics without fear of postoperative pain.

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