Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 82.06

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

A Comparative study of Protaper and Wave One file systems in reducing post operative pain in root canal treatment

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ABSTRACT

Background: Different single-file systems have been marketed with the ability to prepare root canals with only one instrument. The present study was conducted to compare Protaper and Wave One file systems in reducing post operative pain. **Materials & Methods:** The present study was conducted in the department of Endodontics on 60 patients. The patients were divided into 2 groups of 30 each. Cleaning and shaping of root canals was done using PTN (Group I) and Wave One instruments (Group II). Status of postoperative pain was recorded, as described by the patient, according to the pre-established pain categories using VAS at each time points. **Results:** VAS score pre-operatively in group I was 52.6 and in group II was 48.6, after 24 hours was 29.4 in group I and 25.2 in group II, at 48 hours was 24.3 in group I and 23.6 in group II, at 72 hours was 16.4 in group I and 11.2 in group II, after 1 week was 7.2 in group I and 1.2 in group II. The difference was significant (P< 0.05). **Conclusion:** Authors found that WaveOne has less pain score as compared to Protaper in single sitting root canal treatment.

Key words: Protaper, Pain, WaveOne

Received: 22 December, 2019 Accepted: 21 January, 2020

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This article may be cited as: Prasad RS, Kumar N, Kumar B, Priyadarshi V, Kumari A, Kumar A. A Comparative study of Protaper and Wave One file systems in reducing post operative pain in root canal treatment. J Adv Med Dent Scie Res 2020;8(2):127-130.

INTRODUCTION

Successful endodontic therapy depends on many factor, one of the most important step in any root canal treatment is root canal preparation. In addition, respecting the original shape of the canal is of the same importance; otherwise, canal aberrations such as transportation will be created. The basic principles of root canal treatment are the eradication of root canal irritant, obturation of the root canal system and preservation of the natural dentition.[1] Traditionally root canal treatment is performed in multiple visits; however with various advances in materials and techniques in endodontics, single visit root canal treatment is now being commonly performed in indicated cases.[2] Despite advances in endodontic therapy, studies have shown that pain frequency and intensity vary after root canal treatment. The incidence of post obturation pain, which, although often short-lived, is embarrassing for the

dentist and annoying for the patient, especially if the tooth was symptomless before the start of treatment.[3]
Recently, different single-file systems have been marketed with the ability to prepare root canals with only one instrument. Wave One and Reciproc instruments are manufactured from M-wire alloy.[4] The One- Shape file by Micro Mega is another single-file system, but used in continuous clockwise rotation. These instruments have an innovative design with three different cross-sectional areas over the entire length of the working part and have a variable pitch and a noncutting safety tip.[5] The present study was conducted to compare Protaper and Wave One file systems in reducing post operative pain.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. The approval was taken from the institutional ethical committee. Patients reporting to the department were screened and selected based on the presence of symptomatic irreversible pulpitis with/without

The patients were divided into 2 groups of 30 each. After administering local anesthesia (2% lidocaine 1:80,000 an ideal access opening and glide path establishment were done. The working
length was determined using an apex locator and confirmed radiographically. Cleaning and shaping of root canals was done using PTN and Wave One instruments were used in reciprocating mode with
endomotor X-SMART® Plus. Intermittent irrigation with 10 ml of 5.25% NaOCl per canal was done using a 30G side-vented needle at 1 mm short of working length followed by the use of normal saline and 17% aqueous EDTA, which was activated using an EndoActivator. Patients were contacted telephonically by the principal operator after 24, 48, and 72 h, and assessed clinically after 7 days. Status of postoperative pain was recorded, as described by the patient, according to the pre-established pain categories using VAS at each time points. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
System	Protaper	WaveOne
Number	30	30

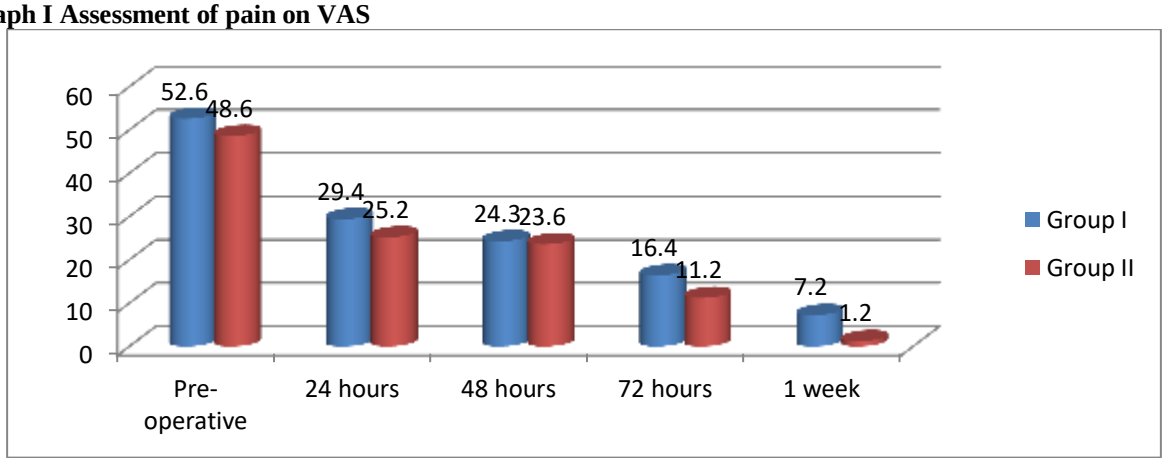
Table I shows that group I patients were treated with Protaper file system and group II with WaveOne.

Table II Assessment of pain on VAS

Duration	Group I	Group II	P value
Pre- operative	52.6	48.6	0.05
24 hours	29.4	25.2	0.02
48 hours	24.3	23.6	0.91
72 hours	16.4	11.2	0.01
1 week	7.2	1.2	0.01

Table II shows that VAS score pre-operatively in group I was 52.6 and in group II was 48.6, after 24 hours was 29.4 in group I and 25.2 in group II, at 48 hours was 24.3 in group I and 23.6 in group II, at 72 hours was 16.4 in group I and 11.2 in group II, after 1 week was 7.2 in group I and 1.2 in group II. The difference was significant (P< 0.05).

Graph I Assessment of pain on VAS



DISCUSSION

The success of endodontic therapy is defined not only by the efficacy of cleaning, shaping, and obturation but also by the degree of postoperative discomfort. One of the major shortfalls confronted while evaluating postoperative pain is the subjective nature of this evaluation and the
inherent difficulty in measuring pain.

Single-visit endodontic treatment was chosen to maintain a simple uniform treatment protocol and to rule out the potential influence of intracanal medication.[6] Several etiologic factors are attributed to post-operative pain including a history of preoperative pain, defective canal debridement, hyper occlusion, periapical disease and extrusion of debris into the periapical tissue. Extrusion of infected dentin into the periapical tissue has been suggested as a major source of pain after endodontic treatment. Although debris extrusion is an inevitable finding even when instrumentation is limited to the confines of the canal, different armamentarium seem to be associated with different amounts of debris extrusion with some studies reporting higher amounts of extruded debris after using hand files compared to engine-driven files due to Archamedes screw effect of full rotational movement.[7] The present study was conducted to compare Protaper and Wave One file systems in reducing post operative pain.

In present study, group I patients were treated with Protaper file system and group II with WaveOne. Saha et al[8] compared the incidence of postoperative pain using the ProTaper Next (PTN), WaveOne Gold (WOG), and Self-Adjusting File (SAF) systems. Two hundred and fourteen patients with irreversible pulpitis were selected for single-visit endodontics. The teeth were blindly assigned to three groups based on the instrumentation system used: Group A (PTN), Group B (WOG), and Group C (SAF). Participants were asked to note the incidence of the pre- and postoperative pain on a visual analog scale at different time intervals. The greatest mean pain in Group A (PTN) and Group B (WOG) was found to be maximum in the first 24 h with a significant reduction in pain at the subsequent observation time points of 48 h, 72 h, and 7 days. Group C (SAF) showed minimum pain followed by Group B followed by Group A which showed comparatively higher pain scores even at the end of 7 days. In single-visit endodontics, SAF system may prove to be a better system compared with PTN and WOG as it produces minimal postoperative pain, thus improving the overall acceptance of endodontic treatment.

Mollashahi et al[9] compared the intensity of postoperative pain after endodontic treatment using hand files, single file rotary (OneShape), and single file reciprocating (Reciproc) systems. A total of 150 healthy patients aged between 20 to 50 years old were diagnosed with symptomatic irreversible pulpitis of one maxillary or mandibular molars. The teeth were randomly assigned to three groups according to the root canal instrumentation technique: hand files (control), OneShape and Reciproc. Treatment was performed in a single visit by an endodontist. The severity of the postoperative pain was assessed by the visual analogue scale (VAS) after 6, 12, 24, 48 and 72 h. The patients in control group reported significantly higher mean postoperative pain intensity at 12, 24, 48, and 72 h compared to the patients in the two other groups ($P<0.05$). There was no significant difference in mean intensity of postoperative pain between Reciproc and OneShape at 5 time points.

We found that VAS score pre-operatively in group I was 52.6 and in group II was 48.6, after 24 hours was 29.4 in group I and 25.2 in group II, at 48 hours was 24.3 in group I and 23.6 in group II, at 72 hours was 16.4 in group I and 11.2 in group II, after 1 week was 7.2 in group I and 1.2 in group II.

Postoperative pain associated with irreversible pulpitis is commonly associated with preparation procedures, arising from an immune response to the irrigant, microorganisms present in extruded debris, over instrumentation, or foreign body reactions to filling materials.[10]

CONCLUSION

Authors found that WaveOne has less pain score as compared to Protaper in single sitting root canal treatment.

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