

Original Research

Postoperative pain assessment following root canal treatment using hand and rotary instrumentation

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ABSTRACT:

Background: Postoperative pain is a frequent complication associated with root canal treatment, and can be influenced by insufficient root canal preparation, extrusion of irrigant, debris or intra canal inter-appointment medicament, presence of preoperative pain, presence of periapical pathosis, and apical patency during root canal instrumentation. The present study was conducted to compare postoperative pain after root canal treatment using hand and rotary instruments in non- vital teeth. **Materials & Methods:** 40 patients requiring root canal treatment were subjected to root canals treatment using the hand instrumentation in group I and ProTaper rotary instrumentation technique in group II. Postoperative pain was recorded using a visual analog scale (VAS) at 24 hours, 72 hours and 7 days. **Results:** VAS score 0 was seen in 18 at 24 hours, 19 at 72 hours and 20 at 7 days in group I and 19 at 24 hours, 20 at 72 hours and 20 at 7 days in group II. VAS score 1 was seen in 1 and score 2 in 1 patient in group I at 24 hours, in group II 1 patient each had score 1 at 24 hours. **Conclusion:** Rotary instrumentations had less postoperative pain as compared to hand instrumentation.

Key words: Pain, VAS, Root canal treatment

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INTRODUCTION

Postoperative pain is a frequent complication associated with root canal treatment, and can be influenced by insufficient root canal preparation, extrusion of irrigant, debris or intra canal inter-appointment medicament, presence of preoperative pain, presence of periapical pathosis, and apical patency during root canal instrumentation. The apical extrusion of irrigant and debris, including bacteria and necrotic tissue, may lead to postoperative pain, inflammation and Even though all instrumentation techniques and instruments are associated with debris extrusion, may affect the amount of debris extrusion, the instrumentation technique and file design may affect amount of debris extrusion.

During chemomechanical preparation of the root canals, all instrumentation techniques can produce apical extrusion of debris, even when short of the apical

foramen. Some debris, such as dentin and necrotic debris, microorganisms, pulp tissue remnants, and irrigating solutions cause irritation to the periradicular tissue, thereby provoking different levels of postoperative pain.

Post-endodontic pain can be caused by several factors. The most important seems to be related to the instrumentation procedure, which can provoke an acute periapical inflammatory response secondary to mechanical, chemical and/or microbial injury to the periradicular tissues. Inflammation may be produced by the extrusion of dentinal debris, pulp tissue, microorganisms, and irrigants to the periapical tissues during chemo-mechanical preparation. The intensity of pain seems to be correlated with the extent of tissue damage. In order to simplify endodontic instrumentation and improve the fracture resistance of

rotary nickel-titanium (NiTi) files, the concept of shaping canals with a single file was introduced in endodontics. The present study was conducted to compare postoperative pain after root canal treatment using hand and rotary instruments in non- vital teeth.

MATERIALS & METHODS

The present study was conducted among 40 patients requiring RCT in non- vital molars. All were informed and their consent was obtained. The study was approved from institutional ethical committee. Data such as name, age, gender etc. was recorded. In group I, biomechanical preparation of the root canals was performed using the hand instrumentation using K file and in group II, ProTaper rotary instrumentation technique was used. Postoperative pain was recorded using a visual analog scale (VAS) at 24 hours, 72 hours and 7 days after the endodontic procedure. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Technique	Hand instrumentation	Rotary instrumentation
Number	20	20

Table I shows that hand instrumentation was performed in group I and ProTaper rotary instrumentation technique in group II. Each group comprised of 20 patients.

Table II Assessment of pain in both groups

VAS	Group I			Group II		
	24 hours	72 hours	7 days	24 hours	72 hours	7 days
0	18	19	20	19	20	20
1	1	1	0	1	0	0
2	1	0	0	0	0	0
3	0	0	0	0	0	0

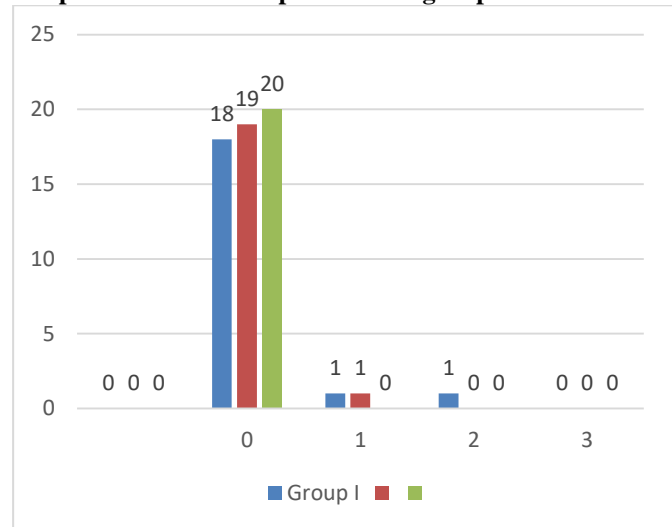
Table II, graph I shows that VAS score 0 was seen in 18 at 24 hours, 19 at 72 hours and 20 at 7 days in group I and 19 at 24 hours, 20 at 72 hours and 20 at 7 days in group II. VAS score 1 was seen in 1 and score 2 in 1 patient in group I at 24 hours, in group II 1 patient each had score 1 at 24 hours. The difference was significant (P< 0.05).

DISCUSSION

Postoperative pain, described as the perception of any annoyance after root canal treatment, is reported by 25-40% of patients, regardless of their pulp and periradicular status. Post-endodontic pain usually occurs during the first 2 days after treatment, and generally

diminishes after a few hours. However, it sometimes persists for several days. According to a recent systematic review, the prevalence of pain during the first 24 hours after root canal treatment is 40%, falling to 11% after 7 days. Thus, pain control, both during and after root canal treatment, poses a huge challenge to the clinician. The present study was conducted to compare postoperative pain after root canal treatment using hand and rotary instruments in non- vital teeth.

Graph I Assessment of pain in both groups



In this study we enrolled 40 patients with non- vital mandibular molars requiring root canal treatment. García et al¹¹ compared clinically the incidence of postoperative pain after endodontic treatment using the Reciproc System, taking into account the operator’s experience. One hundred patients scheduled for routine endodontic treatment were enrolled in this study. Endodontic treatment was carried out in a single visit by undergraduate and postgraduate students. The chemomechanical preparation of root canals was performed with Reciproc instruments. Pre-treatment and postoperative pain was recorded using a visual analogue scale (VAS). Postoperative pain and the need for analgesic consumption were assessed at 4, 8, 16, 24, 48 and 72 hours post-treatment. The mean value of pain after root canal treatment was 1.13±1.94 and 1.91±2.07 on a VAS between 0 and 10 in treatments performed by undergraduate and postgraduate students, respectively. There was a significant difference in the incidence of postoperative pain between the two groups (P< 0.05). We found that VAS score 0 was seen in 18 at 24 hours, 19 at 72 hours and 20 at 7 days in group I and 19 at 24 hours, 20 at 72 hours and 20 at 7 days in group II. VAS score 1 was seen in 1 and score 2 in 1 patient in group I at 24 hours, in group II 1 patient each had score 1 at 24 hours. Relvas et al¹² assessed postoperative pain in a prospective randomized clinical trial comparing two

groups, using the Reciproc® system in one group and the ProTaper® rotary system in the other. The study included 78 male patients, aged 18–64 years (mean age of 26 years), with asymptomatic pulp necrosis in mandibular molar teeth (n = 78). The single-session endodontic treatment was performed by a single operator specialized in Endodontics. Mechanical preparation of the root canals was performed using the ProTaper® and Reciproc® instrumentation techniques. Postoperative pain was recorded using a verbal rating scale (VRS) and verbal description with well-defined categories at the three following time intervals: 24 h, 72 h, and 7 days after the endodontic procedure. The assessment of postoperative pain was recorded as no pain, mild pain, moderate pain, and severe pain or flare-up. The incidence of postoperative pain in the ProTaper group (PT) 24 h after the endodontic procedure was 17.9 and 5.1 % after 72 h. In the Reciproc group (RP), the incidence after 24 h was 15.3 and 2.5 % after 72 h.

CONCLUSION

Authors found that rotary instrumentations had less postoperative pain as compared to hand instrumentation.

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