

Original Research

A comparative study of Hand and rotary instrumentation in reducing post-operative pain in root canal treated teeth

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ABSTRACT:

Background: Reducing the incidence and severity of postoperative pain following one-appointment treatment is based on cleaning and disinfection. The present study was conducted to compare hand and rotary instrumentations in reducing post-operative pain in root canal treated teeth. **Materials & Methods:** 40 non vital mandibular molar teeth were divided into 2 groups. Group I teeth were instrumented with rotary technique using rotary Pro Taper files and group II teeth were instrumented with manual technique using step-back method of cleaning and shaping. In both groups pain using VAS and time taken for procedure was recorded after 12 hours, 48 hours, 72 hours and 84 hours. **Results:** In group I, rotary and in group II hand technique was followed. Both groups had 20 teeth each. The mean pain (VAS) score in group I pre-operatively was 6.2 and in group II was 6.9, after 12 hours in group I was 5.0 and in group II was 6.1, after 48 hours was 4.6 in group I and 5.4 in group II, after 72 hours was 1.2 in group I and 2.6 in group II. There was no pain after 84 hours. The mean time taken for instrumentation in group I was 20.6 minutes and in group II was 52.6 minutes. The mean time for obturation in group I was 21.4 minutes and in group II was 42.8 minutes. **Conclusion:** Authors found that rotary instrumentation found to be effective in reducing post-operative pain than hand instrumentation.

Key words: Hand instrumentation, Pain, rotary

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INTRODUCTION

Single-visit root canal treatment has become the treatment of choice due to its advantages when compared to multiple-visit endodontics. It has no risk of bacterial leakage beyond a temporary coronal seal between appointments, immediate familiarity with the internal anatomy, canal shape and contour that facilitates obturation, constant working length, no inter-appointment pain, reduction of clinic time, minimizes fear and anxiety and patient comfort.¹

Reducing the incidence and severity of postoperative pain following one-appointment treatment is based on cleaning and disinfection. A root canal treatment with postoperative pain can result in long-term success, whereas treatment without postoperative pain may result in failure. Various research scholars have done extensive work on vital teeth, but very few studies are conducted on nonvital teeth.²

Canal preparation can be carried out by manual or rotary instrumentation using single or multiple visit technique.³ Conventionally, manual technique with stainless steel files for biomechanical preparation has

been more popular, but their usage has been associated with undesirable canal curvature or root canal that is difficult to fill.⁴ Furthermore, they are more time consuming and may lead to extrusion of infected remnants or debris to the periapical tissues, thus causing more post-operative pain and flare-ups. Hence, attention has been directed toward the development of better root canal preparation technique.⁵ The present study compared hand and rotary instrumentations in reducing post-operative pain in endodontically treated teeth.

MATERIALS & METHODS

This in vivo study was conducted on 40 non vital mandibular molar teeth. The study was approved from institutional ethical committee.

Teeth samples were randomized into 2 groups of 20 each. Group I teeth were instrumented with rotary technique using rotary Pro Taper files and group II teeth were instrumented with manual technique using step-back method of cleaning and shaping. Root canal treatment was performed. In both groups pain using

VAS and time taken for procedure was recorded after 12 hours, 48 hours, 72 hours and 84 hours. Results were analyzed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of teeth

Groups	Group I	Group II
Method	Rotary technique	Manual technique
Number	20	20

Table I shows that in group I, rotary and in group II hand technique was followed. Both groups had 20 teeth each.

Table II Comparison of pain in both groups

Time (Hours)	Group I	Group II	P value
Pre- operative	6.2	6.9	0.81
12 hours	5.0	6.1	0.05
48 hours	4.6	5.4	0.03
72 hours	1.2	2.6	0.001
84 hours	0	0	0

Table II, graph I shows that mean pain (VAS) score in group I pre- operatively was 6.2 and in group II was 6.9, after 12 hours in group I was 5.0 and in group II was 6.1, after 48 hours was 4.6 in group I and 5.4 in group II, after 72 hours was 1.2 in group I and 2.6 in group II. There was no pain after 84 hours. The difference was significant (P< 0.05).

Graph I Comparison of pain in both groups

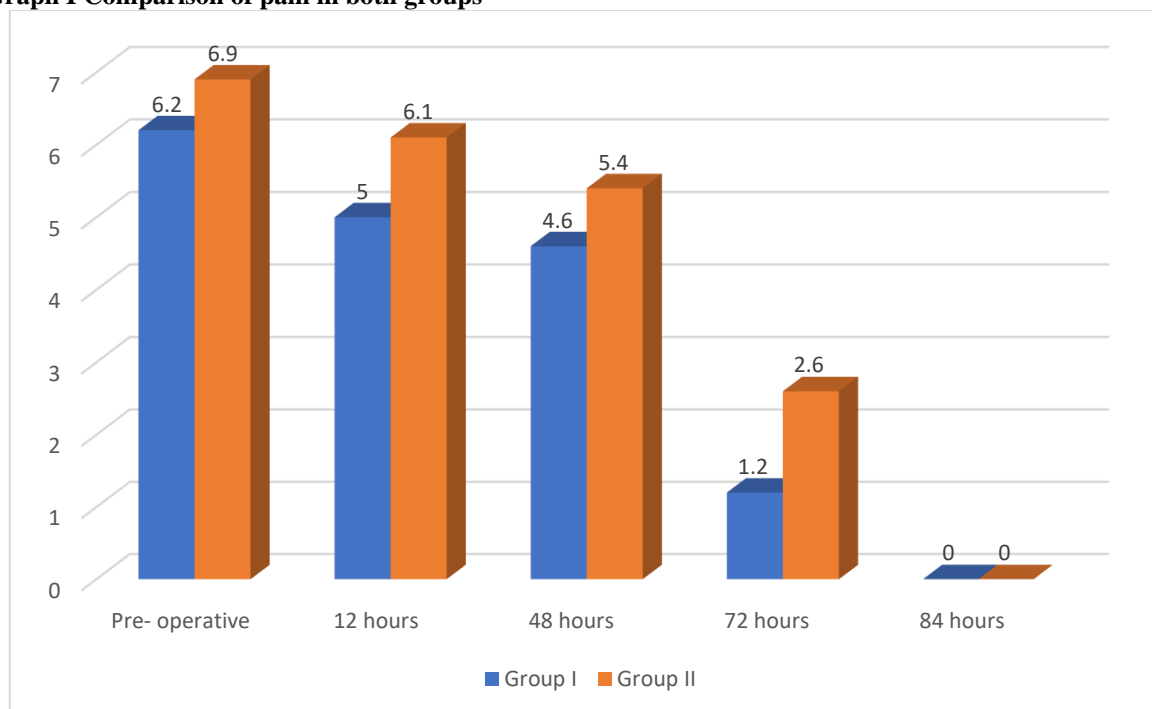
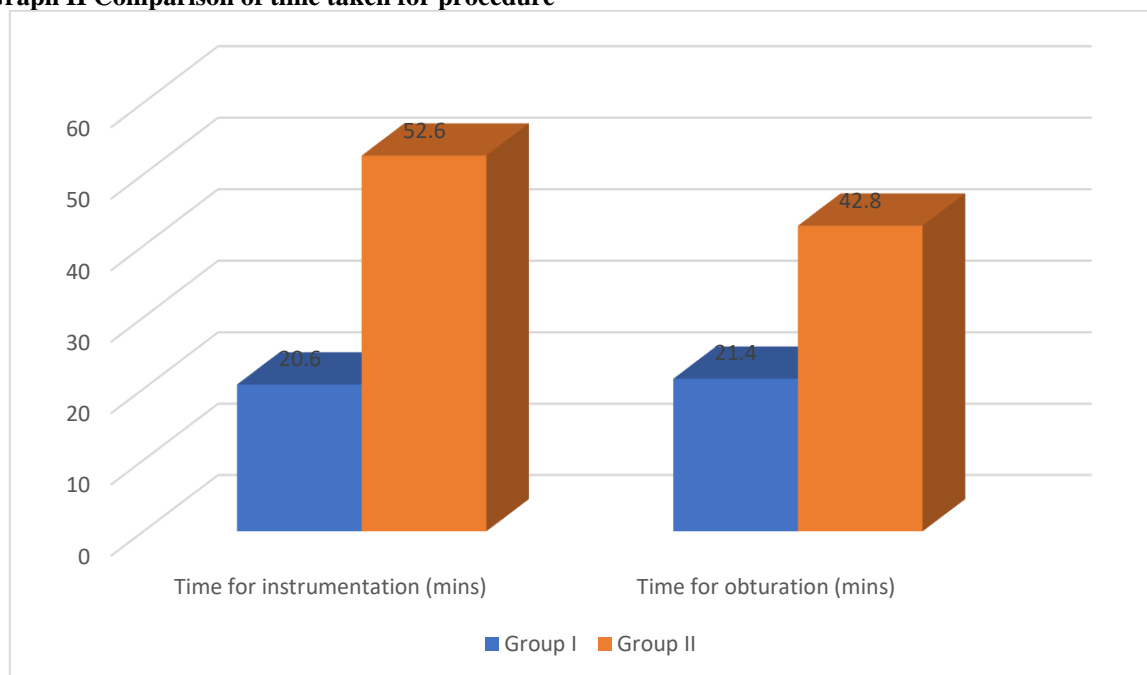


Table III Comparison of time taken for procedure

Groups	Group I	Group II	P value
Time for instrumentation (mins)	20.6	52.6	0.001
Time for obturation (mins)	21.4	42.8	0.001

Table III, graph II shows that mean time taken for instrumentation in group I was 20.6 minutes and in group II was 52.6 minutes. The mean time for obturation in group I was 21.4 minutes and in group II was 42.8 minutes. The difference was significant (P< 0.05).

Graph II Comparison of time taken for procedure

DISCUSSION

The main aim of endodontic treatment is to treat infected and necrotic dental pulp and prevention or treatment of apical periodontitis, thereby maintaining the natural form and function of teeth. Endodontic treatment comprises of three main phases: Biomechanical preparation (cleaning and shaping), disinfection, and obturation of canals.⁶

Post-endodontic pain is an annoying experience for the patient, undermining the patient-clinician relationship.⁷ Despite major improvements in armamentarium and pharmacologic interventions, pain after endodontic treatment remains to be a major problem with a frequency ranging from 1.9 to 48% in the literature. This broad range is probably due to differences in study design and the definition of post-operative pain.⁸ Even when the highest standards are followed, post-endodontic pain of mild (with a frequency of 10-30%) and severe (with a frequency of 6-12%) intensities have been reported in the literature.^{9,10} The present study compared hand and rotary instrumentations in reducing post-operative pain in endodontically treated teeth.

In present study, in group I, rotary and in group II hand technique was followed. Both groups had 20 teeth each. Gupta et al¹¹ compared the frequency of post-operative pain and time taken after ProTaper (NiTi) rotary and manual step-back root canal preparation techniques in single-visit endodontics. In Group I, root canals were prepared by ProTaper (NiTi) rotary instrument and in Group II root canals were prepared by manual step back technique using hand files. Less time was taken with rotary NiTi instrument as compared to manual technique, with no difference in the incidence of post-operative pain in both the groups.

We found that mean pain (VAS) score in group I pre-operatively was 6.2 and in group II was 6.9, after 12 hours in group I was 5.0 and in group II was 6.1, after 48 hours was 4.6 in group I and 5.4 in group II, after 72 hours was 1.2 in group I and 2.6 in group II. There was no pain after 84 hours. Motlani et al¹² evaluated the incidence and severity of postoperative pain following root canal treatment in nonvital pulps with hand and rotary instrumentation techniques. Sixty asymptomatic single-canaled nonvital teeth were selected and were divided into two groups of 30 each. Group I: 30 single-canaled teeth were treated in a single visit and prepared with hand file system. Group II: 30 single-canaled teeth treated in a single visit and prepared with K3-rotary file system. Group I and II were divided into two subgroups of 15 each (Group IA, IB and Group IIA, IIB) which were irrigated with 2% chlorhexidine and 5.25% sodium hypochlorite, respectively. The patients were recalled at 24, 48, and 72 h and at 1 week to record the incidence and severity of postoperative pain by using visual analog scale. Results showed low incidence and severity of postoperative pain following a single-visit treatment with rotary instrumentation when compared to hand instrumentation technique. No statistical significant difference was observed between the groups at different time intervals, i.e., at 24, 48, and 72 h and at 1 week. The use of recent endodontic techniques and devices reduces the postoperative pain.

We observed that mean time taken for instrumentation in group I was 20.6 minutes and in group II was 52.6 minutes. The mean time for obturation in group I was 21.4 minutes and in group II was 42.8 minutes. Mattscheck et al¹³ suggested that the pain is not related to the canal contents, but likely due to procedure, in general. The other reason for pain could

be due to mechanical, chemical, or microbial injuries to the periradicular tissues, thereby resulting in acute inflammation.

CONCLUSION

Authors found that rotary instrumentation found to be effective in reducing post-operative pain than hand instrumentation.

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