

A Correlation Between Post-Operative Pain in Single Visit Rotary Versus Hand K-Files Root Canal Treatment: A Randomized Clinical Trial

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Received: February 10, 2020; **Published:** February 24, 2020

Abstract

Endodontic pain can be atrocious for the patients. The occurrence and intensity of post-endodontic pain can be enhanced by the anomalous instrumentation method. The objective of the study is to compare post-operative pain of motor driven and hand filing after single visit root canal treatment. Randomized clinical trial of sixty participants was completed at Jinnah medical and dental college from March 2019 to August 2019. Participants were selected randomly and divided into two group. For canal preparation in manual group hand k file and in motor driven NiTi was used. Step back technique was implemented for canal cleaning and shaping. Patients were advised to compute pain on a 10 cm horizontal VAS at 4, 8, 12 and 24hours. Rotary files for cleaning and shaping of canals cause less post-operative pain in contrast to hand files which cause more post-operative pain ($p = 0.001$). Rotary NiTi filing system for instrumentation is less responsible for post-operative pain in comparison to manual filing.

Keywords: Root Canal Treatment; Rotary Instrument; Hand K-files; Single Visit; Post-Operative Pain; Endodontics

Introduction

Endodontic treatment is a complex procedure which comprises discrete steps. Each step carries a vital significance; however, canal preparation is fundamental for efficacious root canal treatment [1]. Pulp denervation and decontamination via endodontic instrumentation and adequate irrigation leads to successful endodontic treatment [2]. The endodontic failure results mainly from residual irritants and microbial remnants during canal preparation residing root canal system [3]. Although different techniques have been implemented for endodontic preparation however chemo- mechanical has shown the most favorable results [4,5]. During canal preparation, susceptibility of irritants to cross apical foramen and reside peri-apical region is very high, [6-11] ultimately resulting in post-operative pain, inflammation and flare ups [12-14]. According to researches, instrumentation technique using up and down stroke is more accountable for apical extrusion of irritants than rotational one. On the other hand, motor driven endodontic files grounds for less debris extrusion than hand filing [9,10,13,15,18]. Researches on hand instrumentation techniques have illustrated more post-operative pain in contrast to NiTi files [17-22]. On the contrary, no major difference in post-operative pain was observed with different instrumentation technique [22]. Instrumentation has no association with post-endodontic pain, as assessed from preceding studies [23]. Similarly, number of visits

has no affiliation with post-op pain [24-29] although, some researches have revealed severe pain completed in multiple visits [30,31]. While other depicted more pain in single visit endodontic procedure [32-35].

The objective of the study is to compare post-operative pain of motor driven and hand filing after single visit root canal treatment.

Materials and Methods

Randomized clinical trial of sixty participants was completed at Jinnah medical and dental college from March 2019 to August 2019. Participants were selected randomly and divided into two group. For canal preparation in manual group hand k file and in motor driven NiTi was used. Step back technique was implemented for canal cleaning and shaping. Patients were advised to compute pain on a 10 cm horizontal VAS at 4, 8, 12 and 24hours and re-visit after 1 day for final assessment. Patients were prescribed with ibuprofen after 4 to 6 hours. Informed consent was signed by all individuals. SPSS 23.00 version was used for analysis. Chi-square and Mann Whitney test was applied to compare and evaluate pain incidence.

Results

Gender	Male	43.3%
	Female	53.3%
Age	13 - 20 years	10%
	21 - 30 years	35%
	31 - 40 years	40%
	41 - 50 years	5%
	51 - 60 years	10%
Arch	Maxilla	39%
	Mandible	61%
Type of Treatment	Rotary	50%
	Hand k - file	50%

Table 1: Demographic data of the patients.

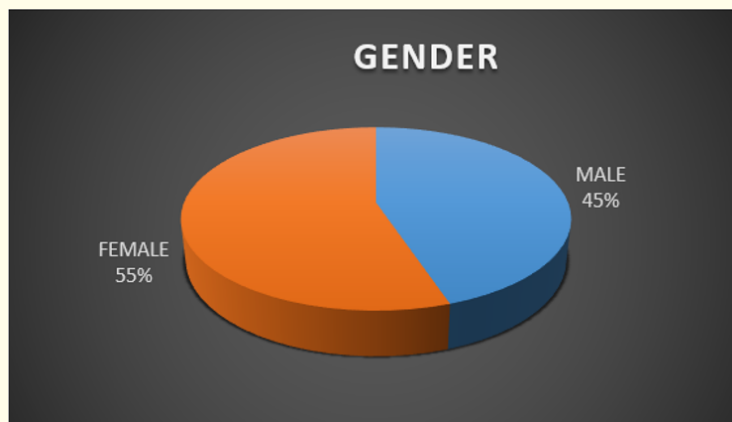


Figure 1: Shows the gender distribution.

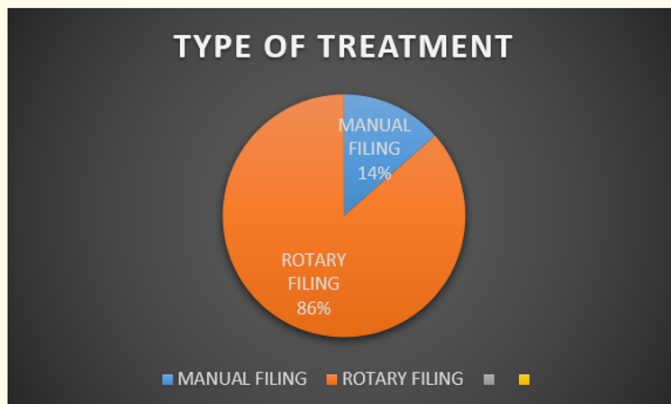


Figure 2: Shows the different treatment option of the patients.

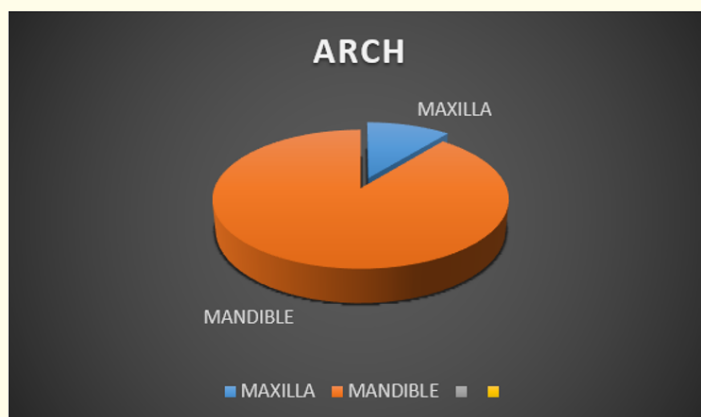


Figure 3: Shows the region involved in the study.

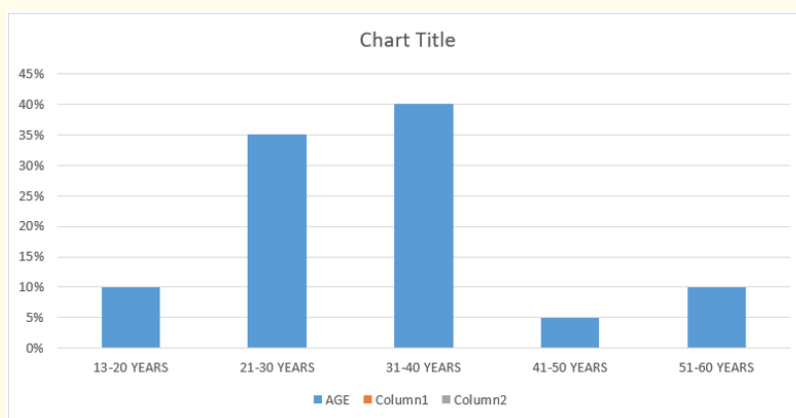


Figure 4: Age range of the Patients participated in the study.

Sixty patients participated in this randomized clinical trial, out of which 53.3% were female and 43.3% were male. The VAS pain score, measured by the patient is mentioned in below table 2. 34 did not felt to take painkiller after treatment, out of whom 26 (43.3%) were from rotary group and 8 (13.3%) were from hand group. which, 17 were from the rotary group (56.7%), and one was from the hand K-file group (3.3%). The difference in the incidence of postoperative pain among the two distinct groups was significant i.e. $p = 0.001$.

	Rotary group	Manual group	p Value
P0	24.60 ± 0.80	38.92 ± 0.94	0.00
P4	23.35 ± 0.65	38.02 ± 0.99	0.00
P8	23.25 ± 0.77	37.63 ± 1.20	0.01
P12	22.08 ± 0.98	37.75 ± 1.10	0.00
P24	22.01 ± 0.99	36.40 ± 0.90	0.03

Table 2: Mean and standard deviation of the groups.

Pain		Rotary group	Manual group	p Value
P4	None	19 (63.3%)	3 (10.0%)	0.00
	Mild	6 (20.0%)	12 (40%)	
	Moderate	2 (6.7%)	7 (23.3%)	
	Severe	3 (10.0%)	8 (26.6%)	
P8	None	22 (73.3%)	10 (33.3%)	0.01
	Mild	5 (16.7%)	5 (16.7%)	
	Moderate	2 (6.7%)	7 (23.3%)	
	Severe	1 (3.3%)	8 (26.6%)	
P12	None	24 (80.0%)	11 (36.6%)	0.00
	Mild	3 (10.0%)	5 (16.7%)	
	Moderate	3 (10.0%)	8 (26.6%)	
	Severe	0 (0%)	6 (20%)	
P24	None	25 (83.3%)	12 (40%)	0.03
	Mild	1 (3.3%)	13 (43.3%)	
	Moderate	3 (10.0%)	1 (3.3%)	
	Severe	1 (3.3%)	4 (13.3%)	

Table 3: Frequencies of the patient experience pain during treatment.

Discussion

Endodontic cleaning and shaping of canals with hand k-files causes more pain after treatment in comparison to motor driven as suggested by our findings. Moreover, after treatment in manual group 41% of the patients felt pain whereas in rotary group only 11% encountered pain which clearly depicts more pain in manual group. Al-Jabreen led a study using 3 instrumentation technique on necrotic pulps of maxillary central incisors. He used stainless steel k file, Profile 0.04 - 29% series and Profile GT system to assess the pain. His findings suggested more post-op pain with hand filing which evidently back our results [21]. A similar study was performed on molar tooth using NiTi and K-Flexo filing system and there results also coincide with our findings [20]. Likewise, Huang et al found the same results as he compared pain after canal preparation with K3 nickel-titanium rotary instruments and hand instruments [20].

Conclusion

Rotary NiTi filing system for instrumentation is less responsible for post-operative pain in comparison to manual filing. However, further and advance studies are required.

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Volume 19 Issue 3 March 2020

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