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ANALYSIS OF QUALITY OF ROOT CANAL OBTURATION IN SINGLE ROOTED TEETH BY MANUAL AND ROTARY METHOD

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Abstract:

Introduction: *The prognosis of root canal treatment (RCT) depends on many variables; amongst them is the technical quality of the root filling. During the last decade, endodontic therapy went through a fascinating development.*

Aims and objectives: *The main objective of the study is to find the quality of root canal obturation in single rooted teeth by manual and rotary method.*

Material and method: *This cross sectional study was conducted in Demontmorency College of Dentistry, Lahore during March 2018 to December 2018. The data was collected from 100 root canal patients. The root canal was done by manual and rotary method. Before starting the treatment, patients were informed about the procedure and informed consent was taken. The data was divided into two parts, one was those patients who done root canal by manual method and second was done by rotary method.*

Results: *The data was collected from 100 root canal patients. There was no statistically significant difference among both techniques. Overall, the void percentages were similar ($p>0.05$) for all groups at the three evaluated sections (cervical, middle and apical). There was significantly more GP and lesser sealer ($p<0.05$) in the canals prepared with the mechanical method compared with the manual method at the 4 mm level. The ultrasonic method showed intermediate values.*

Conclusion: *It is concluded that rotary method was much better as compared to manual method. Overall quality of obturation was better with rotary canal preparation technique as compared to manual canal preparation technique.*

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INTRODUCTION:

The prognosis of root canal treatment (RCT) depends on many variables; amongst them is the technical quality of the root filling. During the last decade, endodontic therapy went through a fascinating development. The introduction of operating microscope, rotary nickel titanium instruments, and Protaper enabled the practitioner to better shape the root canal system. The importance of maintaining the original shape of a root canal during and after cleaning and shaping in order to promote periapical healing in endodontic cases has been demonstrated in several studies [1]. The clinician's inability to maintain the original shape and to develop the proper taper of canals can result in procedural errors such as ledges and perforations. It has been shown that endodontic treatment success is dependent both on the quality of the obturation and the final restoration [2].

The quality of the endodontic obturation is usually evaluated using radiographic images upon completion. Additionally, during the root canal preparation and obturation phases of treatment, clinical criteria can be identified that are essential for achieving an adequate root canal obturation. Sealing the root canal system is an important step in root canal treatment for a successful outcome [3]. Several techniques and materials have been introduced for a three-dimensional obturation with higher density and homogeneity. Void-free filled canals carry a lower risk of apical periodontitis [4]. Gutta-percha has long been used as a popular root filling material. The chemical and physical properties of gutta percha enable its application in several obturation techniques [5].

Aims and objectives:

The main objective of the study is to find the quality of root canal obturation in single rooted teeth by manual and rotary method.

MATERIAL AND METHOD:

This cross sectional study was conducted in Demontmorency College of Dentistry, Lahore during March 2018 to December 2018. The data was collected from 100 root canal patients. The root canal was done by manual and rotary method. Before starting the treatment, patients were informed about the procedure and informed consent was taken. The data was divided into two parts, one was those patients who done root canal by manual method and second was done by rotary method. The time taken for obturation of each root canal was recorded using a stopwatch to compare the obturation times among different groups. Time of obturation was calculated from the introduction of sealer into the root canal until cutting the gutta-percha at the canal orifice and condensing it.

Statistical analysis:

Two-way ANOVA was used to compare the mean percentages of void areas in different obturation techniques and type of specimens.

RESULTS:

The data was collected from 100 root canal patients. There was no statistically significant difference among both techniques. Overall, the void percentages were similar ($p>0.05$) for all groups at the three evaluated sections (cervical, middle and apical). There was significantly more GP and lesser sealer ($p<0.05$) in the canals prepared with the mechanical method compared with the manual method at the 4 mm level. The ultrasonic method showed intermediate values.

Table 01: Analysis of comparison of manual and rotary method root canal techniques.

Technical quality of root filling	Criteria for technical quality of root filling	Manual preparation	Rotary preparation	Chi-square value	df	*p*value
Length of root filling	Adequate	18	27	16.20	2	<0.001
	Under filled	10	1			
	Overfilled	2	2			
Density of root filling	Adequate	14	25	8.864	1	<0.001
	Inadequate	16	5			
Taper of root filling	Adequate	12	27	16.48	1	<0.001
	Inadequate	18	3			

DISCUSSION:

This present study showed no difference between the two study groups in terms of homogeneity of the root canal filling. Frequency of cases with adequate density in rotary group was slightly greater than in conventional group (manual) [6]. Various other studies on engine driven Niti files and rotary systems have also showed that use of these systems avoids procedural errors and helps to maintain natural framework and anatomy of the canal giving a better taper to the root filling [7]. The frequency of teeth with adequate taper of root filling in the present study was less (40%) with manual preparation but significantly higher in case of rotary preparation (90%). Overall adequate taper in the present study was (65%) almost comparable to the results of previous studies. This could be attributed to the highly subjective assessment of this variable radiographically [8].

All procedural errors cannot be depicted on radio-graphs. Over-instrumentation, for example, which may push pulp remnants and microorganisms beyond the apex causing acute apical periodontitis, can be detected by the use of radiographs only when it is followed by extrusion of filling material but not during previous stages of RCT [9]. Pettiette *et al*. and Gluskin *et al*. reported that when dental students used either hand or rotary nickel– titanium instruments, canals were prepared with less procedural errors and more successful treatment occurred compared to using conventional stainless steel instruments [10].

CONCLUSION:

It is concluded that rotary method was much better as compared to manual method. Overall quality of obturation was better with rotary canal preparation technique as compared to manual canal preparation technique.

REFERENCES:

1. Ray HA, Trope M. Periapical status of endodontically treated teeth in relation to the technical quality of the root filling and the coronal restoration. Int. Endod. J. 1995;28:12–18.
2. Burch JG, Hulen S. The relationship of the apical foramen to the anatomic apex of the tooth root. Oral Surg. Oral Med. Oral Pathol. 1972;34:262–268.
3. Pineda F, Kuttler Y. Deviation of the apical foramen from the radiographic apex. Oral Health. 1972;62:10–13.
4. Chugal NM, Clive JM, Spångberg LSM. Endodontic infection: some biologic and treatment factors associated with outcome. Oral Surg. Oral Med. Oral Pathol. Oral Radio and Endod. 2003;96:81–90.
5. Buckly M, Spa °ngberg LSW. The prevalence and technical quality of endodontic treatment in an American subpopulation. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics. 1995;79:92–100.
6. Saunders WP, Saunders EM, Sadiq J, Cruickshank E. Technical standard of root canal treatment in an adult Scottish sub-population. British Dental Journal. 1997;182:382–386.
7. Boltacz-Rzepkowska E, Pawlicka H. Radiographic features and outcome of root canal treatment carried out in the Łodz′ region of Poland. International Endodontic Journal. 2003;36:27–32.
8. Sjögren U, Hägglund B, Sundqvist G, Wing K. Factors affecting the long term results of endodontic treatment. Journal of Endodontics. 1990;16:498–504.
9. Smith CS, Setchell DJ, Harty FJ. Factors influencing the success of conventional root canal therapy - a five-year retrospective study. International Endodontic Journal. 1993;26:321–333.
10. Marques MD, Moreira B, Eriksen HM. Prevalence of apical periodontitis and results of endodontic treatment in an adult, Portuguese population. International Endodontic Journal. 1998;31:161–165.