e-ISSN:2320-7949
p-ISSN:2322-0090

Research & Reviews: Journal of Dental Sciences

Root Canal Treatment Quality in Maxillary and Mandibular 6 Anteriors in Palestinian Subpopulation

Dr. Abeer Hammouz[1]*, Dr. Ziyad Kamal[2] and Dr. Majd salameh[3]

[1]Research and Teaching Assistant, Arab American University, Palestine

[2]Assistant Professor, Prosthodontic and Conservative Department, Faculty of Dentistry, Arab American University, Palestine

[3]BDS , Phd Endodontics assistant Professor, Prosthodontic and Conservative Department, Faculty of Dentistry, Arab American University, Palestine

Research Article

Received date: 18/11/2015
Accepted date: 05/12/2015
Published date: 13/12/2015

***For Correspondence**

Dr. Abeer Hammouz, Research and Teaching assistant, Arab American University, Palestine.

E-mail: Ashammouz07@den.just.edu.jo

Keywords: Palestinian sub-population, Root canal treatment quality, Anterior teeth.

ABSTRACT

Introduction: There is substantial evidence that the technical quality of root canal filling has a significant effect on the outcome of root canal treatment. The aim of this study was to evaluate the technical quality of root canal fillings performed by dentists in Palestinian community.

Methods: The records of 504 maxillary and mandibular cone beam CT scans, 137 of them found to have endodontic treatment in the anterior teeth, were selected and evaluated. For each tooth, Filling length, density and taper, and presence or absence of void was evaluated. Obturations that have proper length, density and taper, without any void are classified as acceptable root canal fillings.

Results: Of the 137 CBCT, a total of 308 teeth, 83 mandibular teeth and 225 maxillary teeth, 10.84% of the mandibular anteriors have good quality, 9.77% of maxillary anteriors have good quality regardless the peri-radicular area condition.

Conclusion: Technical quality of root fillings performed by Palestinian dentists was found to be less than 15%.

INTRODUCTION

Root canal obturation was the most critical stage of endodontic treatment and it was considered as one of the most important factors determining the prognosis of treatment. The main object of root canal filling is to prevent re-infection of root canal system and allowing the periapical tissue to heal [1].

Many factors can affect the technical quality of root canal filling such as distance between obturation material and root apex, density, voids and taper etc. These factors are often used to evaluate the radiographs of the treated teeth [2-7]. A proper root canal treatment includes: conical form of the prepared root canal from coronal to apex, absence of any void within filling or filling and canal walls and presence of 0.5 to 2 mm distance between radiographic apex and root filling to prevent post treatment disease [2].

The length of root canal filling clearly affects the root canal treatment results. Healing rates of fillings which are 2 mm or more shorter than of the radiographic apex are 87-94% and 68-77.6%, respectively while overfilled canals showed 75-76% healing rate [3].

The relationship between filling density and treatment prognosis is not as clear as filling length and treatment prognosis.

e-ISSN:2320-7949
p-ISSN:2322-0090

MATERIALS AND METHODS

Maxillary and mandibular Cone-beam computed tomography images were taken from patients who required CBCT scans as a supplementary examination before or during dental treatment procedures. The reason these patients required CBCT scans incorporated assessment of bone mass before implantation, detection of the anatomical relationships between root ends and neighboring imperative structures prior any periapical surgery, diagnosis of traumatic injuries for teeth and or bone, tooth fracture, tumor detection, location of impaction before orthodontic treatment and during root canal treatment on complex roots or symptomatic teeth after root canal therapy.

In this study, 504 cone beam CT scans were gathered of them, 137 CBCTs were used, since they have endodontic treatment in any of anterior teeth.

The parameters used in the evaluation for the assessment of the CBCT of the quality of root filling included:

1. Presence or absence of low density of root canal filling **(Figure 1).**
2. Presence or absence of voids within or between fillings and root canal wall **(Figure 1A).**
3. Presence or absence of under filling (more than 2 mm distance between the radiographic apex and filling material) **(Figure 1B).**
4. Presence or absence of overfilling (filling extrusion from the apex).
5. Presence or absence of suitable taper of root canal filling. (measured according to experience of observers) **(Figure 1C).**
6. Presence or absence of facial, palatal or lateral perforation **(Figure 1D).**

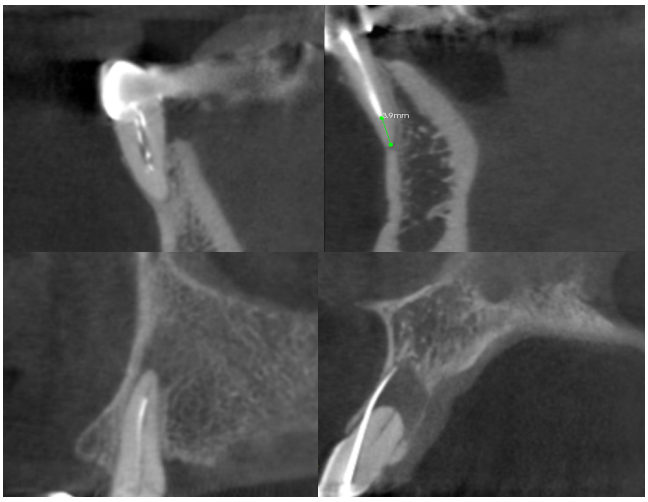

Figure 1. (A) Voids in lower right canine (B) endodontic filling is 3.9 mm short from anatomical apex (C)absence of suitable taper of root canal filling (D) facial perforation.

Score was given to each of these parameters (0 = absence of at least one criteria, 1= presence of all criteria).

RESULTS

This study was done on 137 CBCTs of root canal treatment made by dentists in Palestinian subpopulation in 2013. CBCTs were done for the entire arch, however, only the 6 anterior maxillary and mandibular teeth were included. 42 (30.6%) mandibular CBCTs, 95 (69.3%) maxillary CBCTs.

The result shows that 9 out of 83 (10.84%) of mandibular anteriors have good quality, 22 out of 225 (9.77%) of maxillary anteriors have good quality (good density, absence of void, absence of under filling or overfilling and proper taper of root canal filling). In other cases, there was at least one error.

DISCUSSION

According to the consensus report of the European Society of Endodontolgy [4,5], an appropriate root canal filling should radiographically show a prepared root canal space filled completely without space between the filling and the canal walls and it should be placed within 0.5-2.0 mm of the radiographic apex to prevent post-treatment disease. Root fillings placed within 0-2 mm of the radiographic apex are associated with less post-treatment disease than those that are filled with a distance more than 2 mm from the radiographic apex [6,7]. Sjogren et al. [8] and Smith et al. [9] have reported that the length of the root filling, relative to the radiographic apex, significantly affected the outcome of RCT with 87%[2] and 94%[3] healing rates associated with root filling ending 0-2 mm from the radiographic apex. Poor quality of root fillings in relation to the length and density entails a high risk of failure of the root canal treatment that may result in progressing or persistent periradicularpathosis **(Figure 2).**

e-ISSN:2320-7949
p-ISSN:2322-0090

Figure 2. Good RCT treatment.

Of the 504 CBCTs examined in this study, only 31 maxillary and mandibular teeth (20.61%) of root fillings had high technical quality. Different surveys have demonstrated that general practitioners, even the recently qualified, do not follow guidelines taught during their basic education (Helminen et al., Hill and Rubel) [10-13]. Undoubtedly, this needs to be improved. However, it is already known from an investigation of the frequency and distribution of root-filled teeth and apical periodontitis in a Greek population that the prevalence of apical periodontitis associated with the root-filled teeth was 60% (Georgopoulou et al.). It is well established that the presence of apical periodontitis in root-filled teeth is often associated with inadequate root fillings.

The percentage of unacceptable root fillings was 79.39%. The reason for this high percentage is probably correlated to inadequate chemo-mechanical preparation or/and the filling of the root canals, Furthermore, the lateral condensation of cold gutta-percha in a non-flared or minimally flared root canal may create voids. It's recommended to emphasize on using Ni–Ti instruments and pre-flaring of the root canal before the measurement of the working length and to recapitulate between instruments with a small file to loosen the accumulated debris in the apical portion of the root canal.

We also think that study would have worse results if it was done with more complicated and challenging teeth, such as molars.

The goal of study is not to reveal the relation between the treatment quality and healing, but to show the quality of the root canal treatment done by dentists in Palestinian subpopulation, this is to emphasize the importance of the continues education in both parts theoretical and practical even after the graduation, so that the dentists keep up to date with every single development in this field. Outcomes will be disseminated to improve the skills of the dentists.

CONCLUSION

The result of this study showed that a small proportion of the root canal filling done in Palestinian sub population was quite accurate and had good quality. In conclusion, it's suggested that practical training in endodontics should have a priority in the training programs of the students in the preclinical level and for dentists in clinical level. Also, this research should be revised in the future to reflect new evidences.

REFERENCES

1. Moussa-Badran S, Roy B, Bessart du Parc AS, Bruyant M, Lefevre B, et al. Technical quality of root fillings performed by dental students at the dental teaching centre in Reims, France. Int Endod J. 2008;41:679-684.
2. European Society of Endodontology. Quality guidelines for endodontic treatment: consensus report of the European Society of Endodontology. Int Endod J. 2006;39:921-930.
3. Balto H, Al Khalifah S, Al Mugairin S, Al Deeb M, Al-Madi E. Technical quality of root fillings performed by undergraduate students in Saudi Arabia. Int Endod J. 2010;43:292-300.
4. Undergraduate curriculum guidelines for Endodontology. Int Endod J. 2001;34:574-580.
5. Consensus report of the European Society of Endodontology on quality guidelines for endodontic treatment. Int Endod J. 1994;27:115-124.
6. Saunders WP, Saunders EM, Sadiq J, Cruickshank E. Technical standard of root canal treatment in an adult Scottish sub-population. Br Dent J. 1997;182:382-386.
7. Boltacz-Rzepkowska E, Pawlicka H. Radiographic features and outcome of root canal treatment carried out in the Lodz region of Poland. Int Endod J. 2003;36:27-32.
8. Sjogren U, Hagglund B, Sundqvist G, Wing K. Factors affecting the long term results of endodontic treatment. J Endod. 1990;16:498-504.

9. Smith CS, Setchell DJ, Harry FJ. Factors influencing the success of conventional root canal therapy: A five year retrospective study. Int Endod J. 1993;26:321-333.

10. Helminen SE, Vehkalahti M, Kerosuo E, Murtomaa H. Quality evaluation of process of root canal treatments performed on young adults in Finnish public oral health service. Journal of Dentistry 2000;28:227-232.

11. Stewardson DA. Endodontic standards in general dental practice–a survey in Birmingham.The European Journal of Prosthodontics and Restorative Dentistry. 2001;9:107-112.

12. Stewardson DA. Endodontics and new graduates:Practice vs training. The European Journal of Prosthodontics and Restorative Dentistry. 2002;10:131-7.

13. Hill EE, Rubel BS. Do dental educators need to improve their approach to teaching rubber dam use. Journal of Dental Education. 2008;72:1177-1181.