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Original Article

Assessment Of Quality Of Root Canal Therapy

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ABSTRACT

Background: Root canal therapy is routinely employed procedure these days. Success of root canal therapy is dependent upon the quality of therapy done. Hence; we planned the present study to assess the quality of root canal therapy. **Materials & methods:** The present study included evaluation of quality of root canal therapy. We selected radiographs randomly from the records of all the patients. A total of 100 patients were included in the present study. We included those patients who underwent root canal therapy from carious mandibular first molar. We categories the teeth which were filled with radiopaque material as root canal treated teeth. All the results were analyzed by SPSS software. **Results:** Significant results were obtained while comparing the quality of root canal therapy. We also obtained significant results while comparing the periapical status in patients post-treatment. **Conclusion:** Quality of root canal therapy performed is significantly higher in our study population.

INTRODUCTION

For sustaining the clinical decision making process, it is necessary to know the outcome of root canal treatment (RCT), especially when RCT is weighed against the extraction of natural teeth or replacement by prosthetic elements.[1] The ideal scenario in all clinical situations should combine healing/prevention of disease (apical periodontitis) and the functional retention of the tooth. Understanding the risk factors associated with endodontic failure is a key factor to increase the chances of success. The logical action is to reverse the existing disease, which requires intervention to neutralize the bacterial invasion and disrupt the bacterial biofilm within the complex anatomy.[2- 5] Success is more predictable when the immune host defenses are favorable. However, success has different meanings to the dentist, to the patient and to the tooth itself. The life of an endodontically treated tooth depends on the accuracy of the diagnosis and planning, excellence of disinfection, instrumentation and filling procedures (antimicrobial strategies, root canal shaping and coronal and apical seal) and finally the rehabilitation management.[6- 8] hence; we planned the present study to assess the quality of root canal therapy.

MATERIALS & METHODS

The present study was planned in the department of conservation dentistry of the dental institutional and included evaluation of quality of root canal therapy. Ethical approval was obtained from the institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire

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research protocol. The mean age of the patients of the present study was 49.5 years. We selected radiographs randomly from the records of all the patients. A total of 100 patients were included in the present study. We included those patients who underwent root canal therapy from carious mandibular first molar. Out of these 100 patients, 75 were males and the remaining 25 were females. Two separate endodontists were employed for evaluation of the radiographs of all the patients. We categories the teeth which were filled with radiopaque material as root canal treated teeth. Following criteria was used for categorizing the root canal treated teeth as adequate or inadequate:

- Adequately obturated teeth: Teeth in which radiograph showed obturation between 0 to 2 mm from the radiographic apex
- Inadequately obturated teeth: Teeth in which radiograph showed obturation more than 2 mm from the radiographic apex or extended beyond the apex

Periapical status was categorized as follows:

- Healthy periodontal ligament: Absence of periapical pathology
- Apical periodontitis (AP): Presence of periapical pathology

All the results were analyzed by SPSS software. Chi-square test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

A total of 100 patients were included in the present study. Among 100 patients, 75 were males and 25 were females. Adequate root canal therapy was performed in 75 percent of the patients. Individually, among males and females, adequate root canal therapy was performed in 80 and 60 percent respectively. Significant results were obtained while comparing the quality of root canal therapy (P- value < 0.05). We also obtained significant results while comparing the periapical status in patients post-treatment (P- value < 0.05).

Parameter	Males	Females	Total
Adequately obturated teeth	60	15	75
Inadequately obturated teeth	15	10	25
Total	75	25	100

Table 1: Distribution of cases according success of root canal therapy

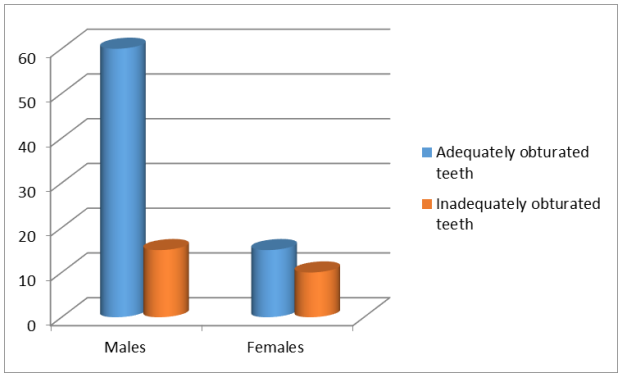
Parameter	Number	Percentage	p- value
Adequately obturated teeth	75	75	0.02
Inadequately obturated teeth	25	25	

Table 2: Comparison of quality of root canal therapy

DISCUSSION

Follow-up studies on root canal treatment[1–5] reported that the technical quality of root canal treatment may affect the outcome of the procedure and the long-term retention of teeth. The probability of apical periodontitis was closely correlated with the quality of the root filling. Periradicular health is associated with root fillings that terminate within 2 mm of the radiographic apex and that are of adequate density.[9- 11] Hence ; we planned the present study to assess the quality of root canal therapy.

In the present study, we observed significant difference while comparing the quality of root canal therapy performed. Unal GC et al evaluated the radiographic quality of root canal fillings performed by first and second clinical year dental students at the Faculty of Dentistry in Süleyman Demirel University, Turkey. The technical quality of 833 root canal fillings was evaluated by three examiners according to the density of the filling and the distance between the end of the filling and the



Graph 1: Distribution of cases according success of root canal therapy

radiographic apex. A root canal with acceptable filling length and homogeneous root filling was defined as being good quality endodontic work (GQEW). A treated tooth was defined as having good quality endodontic work tooth (GQEW-T) when all its canals had a GQEW rating. Of a total of 833 root canals, 662 (79.47%) root fillings were classed as GQEW. Two hundred fifty canals (73.4%) (135 teeth) treated by first clinical year dental students were defined as GQEW-T while 412 canals (204 teeth) (73.9%) treated by second clinical year dental students were defined as GQEW-T (P>.05). Most of the GQEW-T were defined in anterior teeth (90.1%), whereas the fewest were in molar teeth (46.6%) for both first and second clinical year dental students (P<.001). The quality of root canal fillings in anterior teeth performed by undergraduate dental students in Isparta, Turkey was satisfactory.[12]

Adebayo ET et al evaluated the technical quality of root canal fillings done in a general dental clinic with emphasis on the effects of professional experience of the operator, whether tooth was anterior or posterior and whether it was a maxillary or mandibular tooth. Retrospective study of case notes and periapical radiographs of patients with completed root canal fillings seen between 2008 and 2011. Inclusion criteria included cases of primary treatment with available case notes, good quality pre-operative and post-operative periapical radiographs. Technical quality that was assessed was root canal length and homogeneity. Root canal fillings were classified either as Good Quality Endodontic Work (GQEW) or Non- Good Quality Endodontic Work (NGQEW). Fifty-one patients aged between 8 and 54 years (mean 28) fulfilled the inclusion criteria for this study. From these, there were 62 root filled teeth giving a ratio of 1.2 root canal filled teeth per person. There were acceptable length of root canal fillings in 71% of teeth, 58.1% were homogeneous while 53.2% were GQEW. There was no statistically significant difference in whether tooth was root filled by junior or senior dentist (p=0.43), anterior or posterior (p=0.11). There was significant association between GQEW and maxillary teeth (p=0.03). This study showed that the overall technical quality of root canal fillings done by non-specialists was better than earlier reports but lower than that done by endodontists. Since many patients receive treatment from non-specialists in developing countries.[13]

Chueh LH et al evaluated the current technical quality of root canal treatment (RCT) in Taiwan. A total of 1085 RCT cases, randomly selected from a large sample and representative of the Taiwanese population from April to September 2000, were evaluated by eight endodontic specialists. The qualitative evaluation of RCT cases was based on two variables: length of the root filling and density of the obturation. A root canal with both adequate filling length (the apical termination of the root filling within 2 mm of the radiographic apex) and complete obturation (no lateral or apical canal lumen visible in the apical one-third of the root canal) was defined as having good-quality endodontic work (GQEW). A tooth was defined as having a GQEW when all its canals were categorized as GQEW. From a total of 1867 root canals, overfilling occurred in 235 (12.6%), adequate filling length in 1152 (61.7%), underfilling in

466 (25.0%) and no filling in 12 (0.6%). Of the 1867 root canals, 710 (38.0%) demonstrated complete obturation and 1157 (62%) demonstrated incomplete obturation. GQEW was found in 650 (34.8%) root canals and 329 (30.3%) teeth. The percentage of teeth with GQEW in hospital cases (38.1%) was significantly greater ($P < 0.001$) than that in private clinic cases (24.3%). In addition, the frequency of teeth with GQEW in the anterior teeth (40.4%) or in the premolars (33%) was significantly greater ($P < 0.001$) than that in the molars (18.4%). Approximately 70% of the teeth receiving RCT in Taiwan were either of inadequate filling length or sealing density.[14]

CONCLUSION

From the above results, the authors conclude that quality of root canal therapy performed is significantly higher. However; future studies are recommended for better exploration of this field of dentistry.

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