

COMPARISON OF THE TECHNICAL QUALITY OF ROOT CANAL OBTURATION DONE BY AN EXPERIENCED DENTAL SURGEON AND FINAL YEAR DENTAL STUDENTS

K.M. Wijeratne^{1*}, R.W. Pallegama², K.M.C.P. Kahawaththe¹ and J.K.A. Indeewaree¹

¹*Department of Restorative Dentistry,* ²*Department of Basic Sciences, Faculty of Dental Sciences, University of Peradeniya*

Introduction

Root canal treatments is aimed at fixing a tooth by removing the pulp chamber and obturating it with suitable filling materials (Davenport. 2007). Wide range of success rates of root canal obturation have been reported in the literature. (Burke et al., 2009; Bierenkrant et al., 2008). Higher success rates such as 90% have been reported when obturation is done with modern techniques maintaining higher standards (Bierenkrant et al., 2008). But, statistics to describe the quality of the outcome when such advanced procedures are performed by inexperienced operators such as dental students are scarce. The objective of the present study was to compare the technical quality of root canal obturation (in terms of success rate) performed by the final year dentals students of Faculty of Dental Sciences, University of Peradeniya with that of a dental surgeon with an experience of 20 years.

Materials and Methods

Maxillary and mandibular anterior and premolar root canal treated teeth by final year dental students (Sample A) and an experienced dental surgeon (Sample B) were obtained from archives as consecutive samples. The sample A included 151 teeth that have been treated during the period of 2005

to 2007 at the Restorative Clinic of the Teaching Hospital Peradeniya (Dental). The sample B included 151 teeth treated during the period of 2002 to 2007 (Sample B) at the private dental clinic of the experienced dental surgeon. All the teeth selected for the study have been treated within a single visit. Only the teeth that have been treated due to the presence of pulpal and periapical diseases and teeth treated due to elective reasons were selected for the study. Teeth that have been treated for failed previous root canal treatment and teeth, where significant alteration in the standard procedure of treatment (due to complications etc.) is reported in the records, were excluded from the study.

At the time of the treatment, the working lengths of all root canals have been determined using the long cone paralleling technique. The root canal preparation have been done using step back technique with K-files and obturated with gutta percha and root canal sealants by lateral condensation. The post operative radiographs have also been taken by long cone paralleling technique and these radiographs were retrieved from archives for the study.

These radiographs were analyzed by three examiners independently using a single X-ray viewer. The technical quality of the obturation was assessed according to its relationship with the radiographic apex using the four criteria given below (Dugas et al., 2003).

1. Under filled root canal obturation (>2mm short of the radiological apex)
2. Over filled root canals (gutta percha points were extended beyond the radiographic apex)
3. Cement extrusion with gutta percha beyond the apex
4. Adequate root canal obturation (<=2mm from radiographic apex)

Only the teeth categorized under criteria No 4 were considered as successful instances of obturation. Chi-square analysis was performed using the cross-tabulation process of the SPSS version 11.5 for Windows to compare the proportions of success rates of both samples.

Results

In sample A, 52 (34.44%) teeth were identified as successful instances of root canal obturation while 99 (65.56%) teeth were found to be unsuccessful. Out of 151 teeth of sample B, 60 (39.73%) teeth were identified to be successfully obturated while 91 (60.27%) teeth were unsuccessful (Table 01). Chi-square analysis revealed that there is no significant difference in proportions of the successful and failed obturations of both samples (χ^2 value = 0.908, P value = 0.341).

Discussion

When proportions were compared using cross tabulation no statistically significant association was observed between the type of operator and the success rates of the obturation. Although similar success rates have been reported in the literature (Burke et al., 2009; Chueh et al., 2003) higher success rates of obturation, for an example about 90%, have been reported in studies done in certain developed countries (Bierenkrant et al., 2008). Despite the degree of expertise, the relatively lower rates of success observed in the present study can be attributed to rather low technical facilities available in the local settings. The finding that the rates of success of the treatment performed by the final year undergraduate students is comparable to that of an experienced dental surgeon can be considered as a positive factor from the point of view of patients who receive treatment at the Restorative Clinic of the Faculty of Dental Sciences.

Further, the difference in the time span of two samples, lack of records to compare the success of obturation clinically and including teeth treated by only one experienced dental surgeon the in sample B can be considered as limitations of the present study.

Conclusion

Within the limitations of the present study it is reasonable to conclude that there is no significant difference between the success rates of root canal obturation performed by final year dental students and an experienced dental surgeon.

References

Bierenkrant, D.E, Parashos, P. and Messer, H.H. (2008). The technical quality of nonsurgical root canal treatment performed by a selected cohort of Australian endodontists. *Int. Endod. J.* 41(7):561-70.

Burke, F.M., Lynch, C.D., Ní Ríordáin R. and Hannigan, A. 2009. Technical quality of root canal fillings performed in a dental school and the associated retention of root-filled teeth: a clinical follow-up study over a 5-year period. *J Oral Rehabil.* 36(7):508-15.

Chueh, L.H., Chen, S.C., Lee, C.M., Hsu, Y..Y, Pai, S.F., Kuo, M.L, Chen, C.S., Duh, B.R., Yang, S.F., Tung, Y.L. and Hsiao CK. (2003). Technical quality of root canal treatment in Taiwan. *Int. Endod J.* Jun ,36(6):416-22.

Davenport T. (2007). Glossary Definition of Dental Term- Root Canal. About.com.Dugas NN, Lawrence HP, Teplitsky PE, Pharoah MJ, Friedman S. 2003. Periapical health and treatment quality assessment of root-filled teeth in two Canadian populations. *Int Endod J.*, 36(3):181-92.

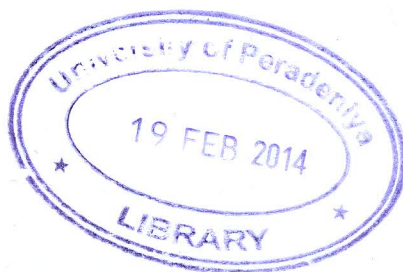


Table 01: Comparison of success rates of root canal obturation of both samples

Operator	Number & percentage of successful obturations	Number & percentage of unsuccessful obturations
Final year dental students (Sample A)	52 (34.44%)	99 (65.56%)
Experienced dental surgeon (Sample B)	60 (39.73%)	91 (60.27%)