

## *Original Article*

### **Assessment of Efficacy of two Different Obturating Techniques while performing Root Canal Therapy: A Comparative Study**

Chandrakanth Majeti<sup>1</sup>, Swathi Gumudavelli<sup>2</sup>, Laxman Roy Ch<sup>3</sup>

<sup>1</sup>Reader Department of Conservative Dentistry and Endodontics, Mamata Dental college, Giri Prasad Nagar, Khammam, <sup>2</sup>BDS, General Dentist, <sup>3</sup>MDS, Consultant Oral and Maxillofacial Surgeon

#### **ABSTRACT**

**Background:** The success of this treatment depends on many factors, and the technical quality of Root canal therapy is one of the most important. The success features of RCT, namely absence of pain, regression of AP, tight seal of canal and coronal spaces, and recovery of tooth function, must be reevaluated over time. Hence; we planned the present study to assess and compare the efficacy of two different obturating techniques in performing root canal therapy. **Materials & methods:** The present research included assessment and comparison of efficacy of two different obturating techniques in performing root canal therapy. A total of 50 freshly extracted mandibular premolars were obtained from the department of oral surgery and orthodontics. All the teeth specimens were randomly divided into two study groups as follows: Group A: Teeth specimens obturated with lateral condensation technique, Group B: Teeth specimens obturated with Obtura II technique. Obturation was carried out in both the study groups according to techniques. Sectioning of the root portion of the tooth specimens was done with double end diamond discs and was assessed under stereomicroscope. Frequency and area of occurrence of voids was calculated and recorded in Microsoft excel sheet. **Results:** Mean area of voids in the Group A specimens was 1.7525 while in mean area of voids in the group B specimens was 10842. While comparing the mean area of voids in between specimens of group A and group B, significant results were obtained. Mean number of voids among specimens of Group A and Group B was 21 percent and 12 percent respectively. While comparing the mean number of voids in between the two study groups significant results were obtained. **Conclusion:** Obtura II technique produced less voids and is more effective in comparison to lateral condensation technique.

**Key words:** Efficacy, Obturation, Root canal treatment.

Received: 12 March 2018

Revised: 14 May 2018

Accepted: 25 June 2018

**Correspondence to:** Dr. Chandrakanth Majeti, Reader Department of Conservative Dentistry and Endodontics, Mamata Dental college, Giri Prasad Nagar, Khammam,

**This article may be cited as:** Majeti C, Gumudavelli S, Laxman Ch Roy L. Assessment of Efficacy of two Different Obturating Techniques while performing Root Canal Therapy: A Comparative Study. J Adv Med Dent Scie Res 2018;6(8):79-81.

#### **INTRODUCTION**

Root canal therapy plays an important role in dental health care. An important parameter necessary to achieve a proper endodontic treatment is the quality of root canal filling. The success rate of root canal treatments (RCTs) is reported to be >90%.<sup>1-3</sup> The success of this treatment depends on many factors, and the technical quality of RCT is one of the most important. On the other hand, numerous studies have been reported in several countries on the high prevalence of poor fillings in association with periapical radiolucency, leading to increasing number of public health problems.<sup>4</sup>

The success features of RCT, namely absence of pain, regression of AP, tight seal of canal and coronal spaces, and recovery of tooth function, must be reevaluated over time. In case of doubt between success and failure, cone beam computed tomography (CBCT) could be indicated for detection and precise localization of apical periodontitis (AP).<sup>5-7</sup>

Cold lateral condensation, after being successfully tested and used, has set the golden standard in endodontics. However, it has been found that cold gutta-percha techniques rely heavily on a root canal sealer to address the problem of the accessory anatomy, as the core filling

material will not move out of the main canal.<sup>8,9</sup> Hence; we planned the present study to assess and compare the efficacy of two different obturating techniques in performing root canal therapy.

**MATERIALS & METHODS**

The present research was planned in the department of conservative dentistry of the dental institute and it included assessment and comparison of efficacy of two different obturating techniques in performing root canal therapy. A total of 50 freshly extracted mandibular premolars were obtained from the department of oral surgery and orthodontics. Carious teeth and teeth with malformed were excluded from the present study. Disinfection of the teeth specimens was done followed by storing them until used for the study. All the teeth specimens were randomly divided into two study groups as follows:

- Group A: Teeth specimens obturated with lateral condensation technique
- Group A: Teeth specimens obturated with Obtura II technique

Canal preparation was done in all the extracted teeth followed by flaring of the coronal third of the canals using Gates Glidden drills. Preparation of the canal was done 1mm short of the apical foramen. ProTaper files were used for instrumenting the canal space. Normal saline was used as irrigant for preparing the root canal. Obturation was carried out in both the study groups according to techniques based on criteria previously described in the literature.<sup>10</sup>After obturation, sealing of the access cavities was done with Cavit G. for seven days, storage of the obturated specimens was done at thirty seven degree centigrade. Sectioning of the root portion of the tooth specimens was done with double end diamond discs and was assessed under stereomicroscope. Frequency and area of occurrence of voids was calculated and recorded in Microsoft excel sheet. All the results were assessed 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**

In the present study, a total of 50 tooth specimens were obtained and were broadly divided into two study groups: Group A and Group B, based on the type of obturating technique followed. Mean area of voids in the Group A specimens was 1.7525 while in mean area of voids in the group B specimens was 10842. While comparing the mean area of voids in between specimens of group A and group B, significant results were obtained (**P- value < 0.05**) (**Table 1**). Mean number of voids among specimens of Group A and Group B was 21 percent and 12 percent respectively. While comparing the mean number of voids in between the two study groups significant results were obtained (**P- value < 0.05**) (**Table 2**).

**Table 1:** Mean area of voids (+SD) in both the study groups

Parameter	Group		P- value
	Group A	Group B	
Number of specimens	25	25	-
Mean area of voids	1.7525	1.0842	0.04 (Significant)
Standard deviation (SD)	1.5234	0.9985	

**Table 2:** Comparison of mean percentage frequency of voids

Parameter	Group		P- value
	Group A	Group B	
Number of voids (expressed as %)	21	12	0.02 (Significant)

**DISCUSSION**

An ideal root canal filling should fill the entire root canal system in three dimensions and form a homogenous mass. Warm vertical (WV) compaction of gutta-percha was proposed in the 1960s, and this technique has been shown to lead to satisfactory results in terms of homogeneity and to fill a high percentage of the root canal area with gutta-percha material. However, the armamentarium required for this technique is considerably more expensive than is required for cold lateral (CL) compaction.<sup>6, 7</sup>Suitable physical properties of Gutta-percha (GP) as the most common root canal obturation material, allow it to apply in several obturation techniques. Although cold lateral condensation is the most commonly used technique, but voids, spreader tracts, incomplete fusion of GP cones, and lack of surface adaptation are among the reported drawbacks.<sup>9, 10</sup>Hence; we planned the present study to assess and compare the efficacy of two different obturating techniques in performing root canal therapy.

In the present study, a total of 50 tooth specimens were obtained and were broadly divided into two study groups: Group A and Group B, based on the type of obturating technique followed. Mean area of voids in the Group A specimens was 1.7525 while in mean area of voids in the group B specimens was 10842. While comparing the mean area of voids in between specimens of group A and group B, significant results were obtained. Ozawa T et al compared the effectiveness of three obturation techniques for oval-shaped canals. Roots of 42 extracted teeth with oval canals were randomly divided into three groups: (1) ProTaper canal preparation and single cone obturation with matching gutta-percha point; (2) ProTaper preparation plus thermoplastic obturation (Thermafil); (3) Profile .06 taper and matching master cone with lateral condensation. Cross-sectional area of the canal space occupied by sealer cement and gutta-percha was measured in the coronal, middle, and apical thirds using an image analysis software. The percentage of the cross-sectional shape occupied by sealer cement was calculated. The Thermafil group was significantly lower than the single cone group or the lateral

condensation group in the middle third and lower than the single cone group in the coronal third. There were no significant differences between the single cone obturation group and the lateral condensation group in each level.<sup>11</sup>

In the present study, mean number of voids among specimens of Group A and Group B was 21 percent and 12 percent respectively. While comparing the mean number of voids in between the two study groups significant results were obtained. KalantarMotamedi MR et al evaluate the technical quality of preclinical molar root canal treatments (RCTs) performed by undergraduate dental students at a dental school in Iran. Further, the effect of using Gates-Glidden (GG) drills on the final quality of RCTs was evaluated. In this retrospective cross-sectional study, 315 roots of 105 endodontically treated teeth in preclinical practice were evaluated radiographically. The analyzed quality parameters included length, taper and density of fillings, which were scored as S2 (adequate standard), the S1 (slight deviation), or S0 (considerable deviation). For all the parameters, acceptable, moderate and poor fillings received total scores of 6, 3-5 and 0-2, respectively. There were two groups of students: One group had used only K-files, and the other had used K-files along with GG drills. The quality of RCTs between these groups was evaluated using the aforementioned scoring protocol. Under-fillings and under-shapings occurred mostly in mandibular root fillings. A lower density was found in maxillary fillings. No relationship was observed between the technique used (irrespective of GG drills usage) and length and taper of fillings. The roots instrumented with GG drills had a higher filling density. The quality mean score of RCTs was improved when GG drills were used. The technical quality of preclinical molar RCTs performed by undergraduate dental students was considered acceptable in 35.6% of the cases. When GG drills were used along with K-files, the technical quality of RCTs was enhanced.<sup>12</sup>

#### CONCLUSION

Under the light of above obtained results, the authors conclude that Obtura II technique produced less voids and is more effective in comparison to lateral condensation

technique. However; further studies are recommended for better exploration of results.

#### REFERENCES

1. Sjogren U, Hagglund B, Sundqvist G, Wing K. Factors affecting the long-term results of endodontic treatment. *J Endod.* 1990;16:498-504.
2. Peak JD, Hayes SJ, Bryant ST, Dummer PM. The outcome of root canal treatment. A retrospective study within the armed forces (Royal Air Force) *Br Dent J.* 2001;190:140-4.
3. Peters LB, Wesselink PR, Moorer WR. The fate and the role of bacteria left in root dentinal tubules. *IntEndod J.* 1995;28:95-9. [PubMed]
4. Lazarski MP, Walker WA, 3rd, Flores CM, Schindler WG, Hargreaves KM. Epidemiological evaluation of the outcomes of nonsurgical root canal treatment in a large cohort of insured dental patients. *J Endod.* 2001;27:791-6.
5. White RR, Goldman M, Lin PS. The influence of the smeared layer upon dentinal tubule penetration by endodontic filling materials. Part II. *J Endod.* 1987;13:369-74.
6. Weller RN, Kimbrough WF, Anderson RW. A comparison of thermoplastic obturation techniques: Adaptation to the canal walls. *J Endod.* 1997;23:703-6.
7. Budd CS, Weller RN, Kulild JC. A comparison of thermoplasticized injectable gutta-percha obturation techniques. *J Endod.* 1991;17:260-4.
8. Wu MK, Tigos E, Wesselink PR. In vitro An 18-month longitudinal study on a new silicon-based sealer, RSARoekoSeal: A leakage study. *Oral Surg Oral Med Oral Pathol Oral RadiolEndod.* 2002;94:499-502.
9. Ingle JI. Obturation of the radicular space. 5th. *Endodontics*; p. 571.
10. Anantula K, Ganta AK. Evaluation and comparison of sealing ability of three different obturation techniques — Lateral condensation, Obtura II, and GuttaFlow: An in vitro study. *Journal of Conservative Dentistry: JCD.* 2011;14(1):57-61.
11. Ozawa T1, Taha N, Messer HH. A comparison of techniques for obturating oval-shaped root canals. *Dent Mater J.* 2009 May;28(3):290-4.
12. KalantarMotamedi MR, Davoodi SHR, Saeidi A, Barekatin B, Noormohammadi H, Razavian H. Technical quality of root canal therapies performed by novice dental students in preclinical practice. *Dental Research Journal.* 2015;12(4):365-371.

**Source of support:** Nil

**Conflict of interest:** None declared

This work is licensed under CC BY: *Creative Commons Attribution 3.0 License.*