

Original Research

Analysis of efficacy of two root canal obturation techniques

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ABSTRACT:

Background: To evaluate the efficacy of two root canal obturation techniques. **Materials & methods:** A total of 20 subjects were enrolled. Obturation was done with 2 methods with 10 in each. The subjects were divided into 2 groups. Group 1, the obturation was done with cold lateral condensation technique and in group 2 warm vertical condensation technique. Filling of the canals were evaluated using Chi-squared test. The results were analysed using SPSS software. **Results:** In group I, the mean percentage of gutta-percha filled was 98.32% whereas in group II, the mean percentage of gutta-percha filled was 93.96%. The voids were less in warm vertical condensation as compared to cold lateral condensation technique. **Conclusion:** Warm vertical condensation technique gives reduced voids as compared to cold lateral obturation technique.

Keywords: obturation, warm vertical condensation, voids.

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INTRODUCTION

A three dimensional seal of the root canal system is achieved by proper root canal obturation to prevent the recurrence of bacterial infection. The microleakage between the root canal and the periapical tissues is hindered leading to death of any surviving microorganisms. This prevents the entry of nutrients and toxic bacterial products into the periapical tissues.¹The next step is to perform obturation of the root canal system that leads to the formation of a three-dimensional and hermetic seal that is able to prevent any recontamination and also prevent periapical fluids to provide nourishment to microorganisms that survived cleansing and shaping procedures, in order to prevent possible multiplication.² In fact, it has been demonstrated that it is not possible to carry out complete cleaning and disinfection of the root canals because of the persistence of certain bacterial species.³The aim of endodontic treatment is therefore to reduce bacterial populations to levels compatible with healing, followed by filling the root canal system with a material capable of creating a three-dimensional seal in order to prevent bacterial micro-infiltration, the

main cause of reinfection and failure of root canal treatment.^{4,5}

The goal of root canal filling is to completely obliterate the canal space with a stable, nontoxic material and at the same time creating a hermetic seal to prevent the movement of tissue fluids, bacteria or bacterial by-products through the filled canal.⁶Obturation provides a seal that prevents reinfection of the canal and subsequent leakage into the periradicular tissues.⁷Although there are many techniques for obturation of root canals, but still search is on for better techniques, as cold lateral condensation (CLC) technique, the most frequently used technique and the standard with which all other techniques are compared, results in creation of voids, spreader tracts and lack of surface adaptation to canal walls.⁸ Hence, this study was conducted to evaluate the efficacy of two root canal obturation techniques.

MATERIALS & METHODS

A total of 20 subjects were enrolled. Obturation was done with 2 methods with 10 in each. The subjects were divided into 2 groups. Group 1, the obturation was done with cold lateral condensation technique and in group 2 warm vertical condensation technique. A

complete history was taken. After obturation, the radiographs were taken for the evaluation. Filling of the canals were evaluated using Chi- squared test. The results were analysed using SPSS software.

RESULTS

A total of 20 subjects were enrolled. The subjects were divided into two groups as in Group 1, the obturation was done with cold lateral condensation technique and in group 2 warm vertical condensation technique. In group I, the mean percentage of gutta-percha filled was 98.32% whereas in group II, the mean percentage of gutta-percha filled was 93.96%. The voids were less in warm vertical condensation as compared to cold lateral condensation technique.

Table: mean percentage of gutta-percha filled area

Groups	No. of samples	Mean (%)	SD
Group I	10	98.32	0.10
Group II	10	93.96	0.66

DISCUSSION

Improper obturation of root canal leads to post-operative complications resulting in failure of endodontic therapy. The root canal space is sealed perfectly by a three-dimensional obturation of the root canal system.⁹ It prevents penetration of bacteria and their products into the periradicular tissues and create a favourable biological environment for the healing of peri-apical tissues. Therefore, it is desirable to perform an excellent cleaning and shaping of the root canal combined with an obturation technique that provides a three-dimensional closure of the system, minimizing the formation of gaps and voids, a possible source of communication with the outside and, therefore, reinfection and failure of the treatment itself.¹⁰ Hence, this study was conducted to evaluate the efficacy of two root canal obturation techniques.

In the present study, a total of 20 subjects were enrolled. The subjects were divided into two groups as in Group 1, the obturation was done with cold lateral condensation technique and in group 2 warm vertical condensation technique. In group I, the mean percentage of gutta-percha filled was 98.32%. A study by Gupta R et al studied a total of 30 central incisors. Biomechanical preparation was done by Reciproc file no 25. Teeth were divided into 3 groups of 10 teeth each according to the obturation technique i.e. Calamus, Thermafil and lateral compaction. Cone beam computed tomography was used to measure filling area and voids at coronal, middle and apical third of the root canal after obturation by different techniques. Data was statistically analysed by One-Way Anova and multiple comparison of Tukey HSD tests. The maximum amount of obturating material was observed in Calamus group followed by Thermafil and lateral compaction. Minimum voids were seen in obturation by Calamus technique. Within the limitations of this study, it can be concluded that Calamus may be a good obturation technique.¹¹

In the present study, in group II, the mean percentage of gutta-percha filled was 93.96%. The voids were less in warm vertical condensation as compared to cold lateral condensation technique. Another study by Migliau G et al, compared the quality of the root canal obturation obtained with two different techniques, i.e., thermoplastic gutta-percha introduced through a carrier (GuttaCore) and fluid gutta-percha (GuttaFlow2). The study included 40 permanent single-rooted human teeth, divided into two groups and obturated with Guttaflow (group G) and with GuttaCore (group T). GuttaCore showed a better filling in the apical third of the canal with a percentage of voids equal to 5%. GuttaFlow showed a lower percentage of voids in the middle and coronal thirds of the canal, 1.6% of coronal voids. Statistical analysis showed a statistically significant difference in the percentage of voids in the two groups (GuttaCore and Guttaflow2) in each portion.¹² Poor results with Thermafill as compared to calamus can be explained by the fact that as in Thermafil obturation, guttapercha can flow through the apical foramen. Thermafil obturation has some other disadvantages like the carrier in the guttapercha may get stripped off in curved and elliptical canals. Worst results were shown by lateral compaction which lack homogeneity of guttapercha mass, less adaptation to canal walls, irregularities and increased number of voids. This is supported by previous studies.¹³

CONCLUSION

Warm vertical condensation technique gives reduced voids and increased adaptation as compared to cold lateral obturation technique.

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