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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 40 subjects were enrolled. Obturation was done with 2 methods with 20 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 98.60% whereas in group II, the mean percentage of gutta-percha filled was 94.32%. 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

The formation of a three-dimensional seal is of fundamental importance in achieving long-term success following root canal therapy. Endodontic therapy includes several phases with specific goals. The first phase involves mechanical instrumentation and chemical irrigation of the root canal with the primary objective of eliminating infected tissue, microorganisms and their byproducts. [1]The 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. [3]The 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]

In recent years, a number of plasticized gutta-percha techniques have been introduced that have purported to seal the root canal better, like Warm Vertical Compaction technique (WVC) and Thermafil obturation technique which incorporate the use of thermal or frictional heat to plasticize the gutta-percha, allowing for better adaptation to canal walls, higher degree of homogeneity and provide optimum apical and coronal sealing when compared to lateral condensation.[6,7] The WVC technique takes advantage of excellent gutta-percha filling as close as possible to the apex. The Thermafil obturation technique produces higher radiopacity, excellent viscosity and fluidity and produces a high degree homogenous mass of gutta-percha in the canal unlike lateral condensation.[8] Hence, this study was conducted to evaluate the efficacy of two root canal obturation techniques.

MATERIALS & METHODS

A total of 40 subjects were enrolled. Obturation was done with 2 methods with 20 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 40 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 98.60% whereas in group II, the mean percentage of gutta-percha filled was 94.32%. 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	20	98.60	0.12
Group II	20	94.32	0.72

DISCUSSION

The main purpose of endodontic treatment is to clean, shape and fll the root canal space thoroughly and prevent any interchange between the oral cavity, the root canal system and periradicular tissues, providing a barrier to reinfection. The success of endodontic treatment depends on adequate mechanical debridement of root canal and quality obturation with biocompatible material.[7] The main cause of endodontic failure is the persistence of microorganisms capable of causing intraradicular orextraradicular infection. [9]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 40 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 98.60%. A study by Samadi F et al, studied sixty single rooted extracted per-manent teeth were collected. After crown amputation, the teeth were randomly divided into three experimental groups of 20 specimens each. Group I–Thermafil obturation technique, group II–warm vertical condensation obturation technique and group III–cold lateral condensation obturation technique. Obturation was performed by specific techniques without using sealers. After obturation, the teeth were cross-sectioned horizontally at 2 to 3 mm from apex with the help of double sided diamond disk. Maximum group difference was observed between groups I and III (3.558 ± 0.138) while minimum difference was observed between groups I and II (1.223 ± 0.137). Thus, all the between group differences were statistically significant.[11]

In the present study, in group II, the mean percentage of gutta-percha filled was 94.32%. 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]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. [13] 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.

CONCLUSION

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

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