



TO EVALUATE THE EFFICACY OF TWO DIFFERENT OBTURATING PROCEDURES FOR ROOT CANAL TREATMENT

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ABSTRACT

In order to prevent bias in the study, a few exclusion criteria were applied, such as excluding teeth having repeated root canals and morphological abnormalities. Group 1 employed the cold lateral condensation approach for obturation, while Group 2 employed the warm vertical condensation technique. The data was statistically analyzed using SPSS version 11.0 for Windows. The significance of the data was assessed using the Student's t-test and the Chi-square test. A statistically significant p-value was regarded as one that was 0.05 or less. Group I had a mean percentage of 97.21% gutta-percha filled, while group II had a mean percentage of 92.85% gutta-percha filled. When using the warm vertical condensation method as opposed to the cold lateral condensation method, there were fewer voids. In comparison to the cold lateral obturation technique, the warm vertical condensation technique results in fewer voids.

KEYWORDS: Obturation, Warm Vertical Condensation, Voids

In order to stop bacterial infections from recurring, appropriate root canal obturation creates a three-dimensional seal within the root canal system. Any microbes that survive are killed off by the obstruction of microleakage between the periapical tissues and the root canal. This stops harmful bacterial products and nutrients from penetrating the periapical tissues (Weller *et al.*, 1997). The next stage involves obturation of the root canal system, which results in the creation of a three-dimensional, hermetic seal capable of preventing periapical fluids from feeding microorganisms that have survived the cleansing and shaping processes and potentially preventing their multiplication (Greco and Cantatore, 2014). In reality, it has been shown that the persistence of some bacterial species makes it impossible to thoroughly clean and disinfect the root canals (Sakamoto *et al.*, 2007). Therefore, the goal of endodontic treatment is to bring bacterial populations down to a level that promotes healing. This is followed by filling the root canal system with a substance that can form a three-dimensional seal to stop bacterial micro-infiltration, which is the primary cause of reinfection and root canal treatment failure (Siqueira Jr. and Rôças, 2008) (Mulyar *et al.*, 2014).

The purpose of root canal filling is to completely fill the canal space with a stable, nontoxic substance while also sealing it off to stop bacteria, tissue fluids, or bacterial byproducts from passing through the filled canal (Bailey, 2004). Obturation creates a seal that stops the canal from becoming infected again and from leaking into

the surrounding tissues (Marciano, 2010). Despite the fact that there are numerous methods for obturating root canals, there is always a need to find better methods because the most popular method, known as the cold lateral condensation (CLC) technique, causes spreader tracts, voids, and a lack of surface adaptation to the canal walls (Leonardo, 2009). Therefore, the purpose of this study was to compare the effectiveness of two methods for root canal obturation.

MATERIALS AND METHODS

Thirty subjects in all were enrolled. Two methods, each with fifteen steps, were used to obturate. In order to prevent bias in the study, a few exclusion criteria were applied, such as excluding teeth having repeated root canals and morphological abnormalities. There were two groups of subjects. Group 2 underwent heated vertical condensation while Group 1 underwent cold lateral condensation obturation. A thorough history was obtained. Radiographs were collected for the evaluation following obturation. The data was statistically analyzed using SPSS version 11.0 for Windows. The significance of the data was assessed using the Student's t-test and the Chi-square test. A statistically significant p-value was regarded as one that was 0.05 or less.

RESULTS

Thirty subjects in all were enrolled. The individuals were split into two groups: group 1 underwent cold lateral condensation obturation, whereas group 2 underwent warm vertical condensation obturation. Group

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I had a mean percentage of 97.21% gutta-percha filled, while group II had a mean percentage of 92.85% gutta-percha filled. When using the warm vertical condensation method as opposed to the cold lateral condensation method, there were fewer voids (Table 1).

Table 1: Mean percentage of gutta-percha filled area

Groups	No. of samples	Mean (%)	SD
Group I	15	97.21	0.08
Group II	15	92.85	0.77

DISCUSSION

Endodontic therapy fails as a result of post-operative problems brought on by improper root canal obturation. A three-dimensional root canal system obturation completely seals the root canal space (Qureshi *et al.*, 2012). It creates a favorable biological environment for the healing of peri-apical tissues and inhibits the invasion of bacteria and their byproducts into the periradicular tissues. In order to minimize the formation of gaps and voids, a potential source of communication with the outside world and, consequently, reinfection and treatment failure, it is desirable to perform an excellent root canal cleaning and shaping in conjunction with an obturation technique that provides a three-dimensional closure of the system (Tabassum and Khan, 2016). Therefore, the purpose of this study was to compare the effectiveness of two methods for root canal obturation.

A total of thirty individuals were enrolled in this investigation. The individuals were split into two groups: group 1 underwent cold lateral condensation obturation, whereas group 2 underwent warm vertical condensation obturation. The average percentage of gutta-percha filled in group I was 97.21%.

Gupta R *et al.* (2015) examined thirty central incisors in their investigation. Through Reciproc file no. 25, biomechanical preparation was carried out. Thermafil, lateral compaction, and Calamus were the three obturation techniques used to separate the teeth into groups of ten teeth each. Following obturation using various methods, the filling area and voids at the coronal, middle, and apical third of the root canal were measured using cone beam computed tomography. Tukey HSD multiple comparison tests and One-Way Anova were used to statistically analyze the data. The group with Calamus had the highest amount of obturating material, followed by Thermafil and lateral compaction. The Calamus technique of obturation revealed the fewest voids possible. Given the constraints of this investigation, it may be said that Calamus might be a useful obturation method (Gupta *et al.*, 2015). The mean percentage of

gutta-percha filled in group II of the current study was 92.85%. When using the warm vertical condensation method as opposed to the cold lateral condensation method, there were fewer voids. Another study by Migliau *et al.* (2022) evaluated the quality of the root canal obturation achieved using two distinct methods: fluid gutta-percha (GuttaFlow2) and thermoplastic gutta-percha delivered through a carrier (GuttaCore). Forty permanent single-rooted human teeth were used in the investigation. The teeth were split into two groups and obturated using Guttaflow (group G) and GuttaCore (group T). The apical portion of the canal had a better filling according to GuttaCore, with a void percentage of 5%. GuttaFlow revealed 1.6% of coronal voids, which is a smaller percentage of voids in the middle and coronal thirds of the canal. A statistical analysis revealed that the percentage of voids in each part between the two groups (GuttaCore and Guttaflow2) differed statistically significantly. Gutta percha can pass through the apical foramen in Thermafill, much like in Thermafill obturation, which explains why Thermafill yields poorer outcomes than Calamus. Other drawbacks of Thermafill obturation include the potential for the gutta percha's carrier to be removed in elliptical and curved channels. The worst outcomes were displayed by lateral compaction, which has an increased number of voids, abnormalities, and a lack of homogeneity in the gutta percha mass. It also shows reduced adaptability to canal walls. Previous research backs up this (Zuolo *et al.*, 2013).

CONCLUSION

In comparison to the cold lateral obturation approach, the warm vertical condensation technique results in fewer voids and more adaptability.

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