

## Original ARTICLE

### Comparison of efficacy of carrier-based obturation technique and Lateral compaction (LC) technique in patients undergoing root canal therapy: A clinical study

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#### ABSTRACT

**Background:** The main goal of endodontic therapy is resolution and/or prevention of apical periodontitis, which can be achieved by thorough cleaning, disinfection, and filling in the three-dimensional context of the root canal system. A key to successful endodontics and a major goal of contemporary nonsurgical root canal treatment is to seal completely, both the apical and coronal avenues of potential leakage. Hence; the present study was undertaken for comparing the efficacy of carrier-based obturation technique and Lateral compaction (LC) technique in patients undergoing root canal therapy. **Materials & methods:** A total of 40 patients scheduled to undergo root canal therapy were enrolled. Assessment of peri-apical radiographs was done. All the patients were broadly divided into two study groups based on the type of obturation technique used as follows; Group 1 - Patients in which Carrier-based obturation (CO) technique was used and Group 2 – Patients in which Lateral compaction (LC) technique was used. All the root canal procedures were performed under the hands of skilled and experienced Endodontists. Clinical and radiographic evaluation of all the patients was done for assessing the prognosis. **Results:** Clinical and radiographic success was seen in 90 percent of the patients of group 1 while it was seen in 95 percent of the patients of group 2. While comparing statistically, non-significant results were obtained while comparing the efficacy of both the obturation techniques. **Conclusion:** In patients undergoing root canal therapy, both the obturation techniques can be used with equal effectiveness. However; further studies are recommended.

**Key words:** Obturation, Root canal therapy

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#### INTRODUCTION

The main goal of endodontic therapy is resolution and/or prevention of apical periodontitis, which can be achieved by thorough cleaning, disinfection, and filling in the three-dimensional context of the root canal system. Failure to locate all canals, incomplete instrumentation, ledge, perforation, and overfilling of the teeth during treatment can cause endodontic failure. Seltzer analyzed local and systemic factors that might affect the endodontic repair process and suggested that endodontic failure may be beyond the dentist's control. The success of endodontic treatment is typically determined by careful evaluation of radiographic findings and clinical signs and/or symptoms of the treated tooth. The histological evaluation has also been used.<sup>1-4</sup>

A key to successful endodontics and a major goal of contemporary nonsurgical root canal treatment is to seal completely, both the apical and coronal avenues of potential leakage and maintain the disinfected status reached by the

chemical and / or mechanical cleaning, to prevent reinfection and percolation of bacterial substrates, allowing the periodontium to maintain its integrity and to achieve healing.<sup>5-8</sup> Hence; the present study was undertaken for comparing the efficacy of carrier-based obturation technique and Lateral compaction (LC) technique in patients undergoing root canal therapy.

#### MATERIALS & METHODS

The present study was conducted for assessing and comparing the efficacy of carrier-based obturation technique and Lateral compaction (LC) technique in patients undergoing root canal therapy. A total of 40 patients scheduled to undergo root canal therapy were enrolled. Complete demographic and clinical details of all the patients were obtained. Diagnosis of irreversible pulpitis was obtained in all the patients after performing pulp testing procedures. Written consent was obtained from all the patients after explaining in detail the entire research protocol. Assessment

of peri-apical radiographs was done. All the patients were broadly divided into two study groups based on the type of obturation technique used as follows;

Group 1 - Patients in which Carrier-based obturation (CO) technique was used and

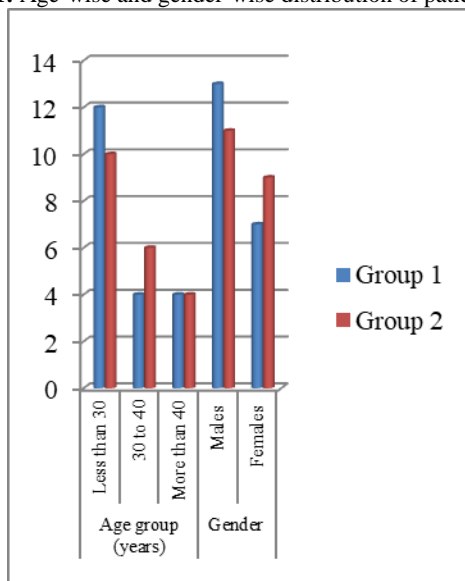
Group 2 – Patients in which Lateral compaction (LC) technique was used.

All the root canal procedures were performed under the hands of skilled and experienced Endodontists. Clinical and radiographic evaluation of all the patients was done for assessing the prognosis. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test and Mann-Whitney U test were used for assessment of level of significance.

**RESULTS**

In the present study, a total of 40 patients were analysed and were broadly divided into two study groups; group 1 and group 2. Complete data of all the patients was obtained. Mean age of the patients of group 1 and group 2 was found to be 29.8 and 28.4 years respectively. There were 13 males and 7 females in group 1 and 11 males and 9 females in group 2. Clinical and radiographic success was seen in 90 percent of the patients of group 1 while it was seen in 95 percent of the patients of group 2. While comparing statistically, non-significant results were obtained while comparing the efficacy of both the obturation techniques.

**Graph 1:** Age-wise and gender-wise distribution of patients



**Table 1:** Prognosis

Parameter		Group 1	Group 2
Clinical	Success	18	19
	Failure	2	1
Radiographic	Success	18	19
	Failure	2	1

**DISCUSSION**

The success of endodontic treatment can be attributed to the root canal preparation associated with chemical irrigation and the endodontic filling providing a tight seal, which is the only way to ensure a long-lasting result. The hermeticity of the root canal filling plays a key role by promoting the healing process.<sup>7- 9</sup>

Hence; the present study was undertaken for comparing the efficacy of carrier-based obturation technique and Lateral compaction (LC) technique in patients undergoing root canal therapy.

In the present study, a total of 40 patients were analysed and were broadly divided into two study groups; group 1 and group 2. Complete data of all the patients was obtained. Mean age of the patients of group 1 and group 2 was found to be 29.8 and 28.4 years respectively. Kapoor C et al assessed the efficacy of two different obturation techniques in patients undergoing root canal therapy. A total of 50 consecutive patients who underwent root canal therapy in relation to mandibular first permanent molar were included. All the patients were broadly divided into two study groups based on the type of obturation technique used; Group A - Carrier-based obturation (CO) technique and Group B - Lateral compaction (LC) technique was used. Follow-up was done in all the patients’ upto a time period of two years. Clinical and radiographic evaluation of all the patients was done for assessing the prognosis. All the results were recorded in Microsoft excel sheet. Majority of the patients of both the study group belonged to the study group was 30 to 40 years. Non-significant results were obtained while comparing the radiographic and clinical success of the patients of both the study groups. The obturation techniques can be used with equal effectiveness among patients undergoing root canal therapy.<sup>10</sup> Bahuguna N et al compared canal volume sealing capacity at different levels from the root apex using various cold and thermal obturating techniques. Fifty extracted human maxillary molars were collected with the mesiobuccal root curvature more than 30°. They were divided into five experimental groups (I–V) with ten teeth in each group. Biomechanical preparation was done using ProTaper rotary system. For all the groups, resin-based sealer resinoseal mixed with methylene blue dye (contrast) was used as the sealer. Groups I and II were obturated with 2% and 4% gutta-percha (GP) cones, respectively, using lateral compaction technique. Group III was obturated with 6% GP cones using single cone technique. Group IV was obturated using Thermafil system and Group V was obturated with 6% GP cones using downpack with Touch n Heat (Sybron Endo) device. All the specimens were sectioned at different levels, i.e., 3, 6, and 9 mm, from the root apex and three-dimensional apical seal was evaluated under stereomicroscope. The stereomicroscopic images showed that all obturation techniques resulted in good apical seal with comparable results. Six percent single cone obturation technique resulted in poor seal (i.e., 6 and 9 mm from the root apex). The best results were shown by Thermafil endodontic obturators at all three levels from root apex. Although various obturation techniques resulted in achieving good three-dimensional obturation with satisfactory apical seal, only thermal systems were successful in achieving good seal at all the levels from the root apex.<sup>11</sup>

In the present study, there were 13 males and 7 females in group 1 and 11 males and 9 females in group 2. Clinical and radiographic success was seen in 90 percent of the patients of group 1 while it was seen in 95 percent of the patients of group 2. While comparing statistically, non-significant results were obtained while comparing the efficacy of both the obturation techniques. Chohayeb AA compared microleakage of Thermafil Obturators to the single cone technique in Lexan blocks simulating root canals (n = 20) stained with Prussian blue dye. The microleakage of Thermafil and laterally condensed extracted human teeth was also investigated after the teeth were stained with India ink or Prussian blue dye over 1- or 2-wk dye immersion periods. In Lexan blocks

there was no statistical difference in mean leakage between the single cone technique and Thermafil. Teeth with Thermafil Obturators exhibited greater leakage than those with the lateral condensation. Greater leakage was also seen where India ink was used. Dye immersion time did not have a significant influence on leakage scores. The combination of India ink with Thermafil demonstrated the greatest average leakage. This study demonstrated that Lexan canal simulating blocks do not mimic extracted human teeth for evaluating microleakage.<sup>12</sup>

## CONCLUSION

Under the light of above obtained data, the authors conclude that in patients undergoing root canal therapy, both the obturation techniques can be used with equal effectiveness. However; further studies are recommended.

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