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Research Paper

Analysis And Comparison Of Obturation Techniques Used For Maxillary Incisors In Ug And Pg Clinics.

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ABSTRACT:
INTRODUCTION:
Removal of the irritants, pathogenic micro- organisms and other by-products from the canal space followed by complete cleaning and shaping, filling of the canal space with a biocompatible material with proper obturating technique is completely essential for the success of any root canal therapy. Recent studies in the field of endodontics focuses on the search of an ideal obturating technique despite the prevalence of the numerous available techniques for obturating the canal after completion of pulp therapy. Therefore, the aim of the present study is to assess the various obturation techniques carried out in the maxillary incisors in the UG and PG clinics.
AIM OF THE STUDY:
The aim of the present study was to analyse and compare the most commonly used obturation techniques in the UG and the PG clinic.
MATERIALS AND METHOD:
Retrospective analysis of all the cases (root canal therapy in relation to the maxillary incisors) was retrieved among the overall data of patients visiting Saveetha Dental College. The data was entered in Excel Spreadsheets. And the collected data was analysed using SPSS software version 21.0. Chi square test was used to analyse the association with a p value of 0.05.
RESULTS:
In the present study, it was seen that lateral compaction was used more frequently than matched single cone technique for obturation and this had a significant association with the type of clinic (p=0.00)
CONCLUSION:
From the present study, it can be concluded that a higher percentage of lateral compaction was found in all the age groups and among the female population taken for the present study. Lateral compaction was more frequently performed in UG clinics than PG clinics
KEYWORDS: *root canal therapy, maxillary central incisors, obturation techniques, gutta percha, novel method, biocompatible material.*

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I. INTRODUCTION:

Removal of the irritants, pathogenic micro-organisms and any other by-products from the canal space followed by complete cleaning and shaping, filling of canal space with a proper biocompatible material with appropriate obturating technique is essential for the success of any root canal therapy.(1).Complete obturation of the canal space with a bio-compatible, non- toxic material for providing a hermetic seal is the primary goal of any endodontic therapy.(2). Re-infection of the pulp space after endodontic therapy is provided in the final phase of endodontic therapy. i.e. Obturation.(3). Recent studies in the field of endodontics focuses mainly on the ideal obturating technique despite the prevalence of numerous available obturating techniques (4).

Warm vertical (WV) compaction obturation technique was proposed in the year 1960s, which has shown satisfactory results in the terms of homogeneity and to fill higher percentage of the root canal area with gutta- percha material compared to other techniques.(5) On the other hand, the armamentarium required for this technique is considerably more expensive than is required for cold lateral (CL) compaction. Another disadvantage of this technique is that the apical control of the filling material can be difficult at times, and some material may even extrude beyond the apical foramen(5,6). Suitable physical properties of the Gutta-percha (GP) the most common root canal obturation material, favours it to apply in several obturation techniques.(7).Although cold lateral compaction technique 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 from the previous studies carried out.(7,8).Thermoplasticized injectable techniques were further introduced to improve the homogeneity and surface adaptation of the gutta percha into the canal spaces.

Various experimental methods have been used to assess the quality of root fillings such as: radioisotope, dye penetration, fluid filtration, bacterial leakage, microscopic analysis, clearing techniques and micro-computed tomography (micro-CT) . In endodontics, micro-CT has been highly used for evaluation of root canal anatomy and morphology following instrumentation.(7–10). Our team has extensive knowledge and research experience that has translated into high quality publications (11–20),(21–24),(25–29) (30).

II. MATERIALS AND METHODS:

- Study design- Institutional based Retrospective study
- Study setting- Private dental institution in Chennai
- Sampling and Scheduling- Owing to the nature of the study design and setting, a convenience sampling method was used , and the data was collected from April 2020 to February 2021.
- Survey instrument- Data collection was done using patient management software which has all the patient's records.
- Inclusion and Exclusion criteria- Inclusion criteria includes patients undergoing root canal therapy in relation to the maxillary incisors 11,12,21,22. Exclusion criteria include age,gender, systemic diseases, occupation,etc.
- Ethical clearance- Prior to the start of the study, ethical clearance was obtained from the institution ethical committee of Saveetha University.
- Statistical analysis- The data from the patient management software was transferred into excel and was then imported to SPSS software by IBM, version 21. Descriptive statistics were done using frequency and percentage. Inferential statistics were done using the Chi- square test. Interpretation was based on the p value less than 0.05 which is statistically significant.

III. RESULTS:

The present study involved age groups of 11-30 years, 30-50 years and 50-70 years of age. Out of which higher percentage of individuals were seen among the 1-50 years of age groups and comparatively lesser percentage among the 51-70years of age group **(Figure 1)**. The study included both males and females out of which females had a higher ratio when compared to the male population in the study **(Figure 2)**. In the common obturation technique evaluated among the study group, lateral compaction was the most commonly used technique and had a higher prevalence rate of about 70.7% when compared to mastered single cone technique which was about 29.3% **(Figure 3)**.

As pertaining to the present study, on comparing the obturation technique among the UG and PG clinics, it was seen that a higher ratio of lateral compaction techniques was being followed among the UG clinic and a higher rate of mastered single cone technique was being followed among the PG clinics and this was statistically significant **(Figure 4)**.

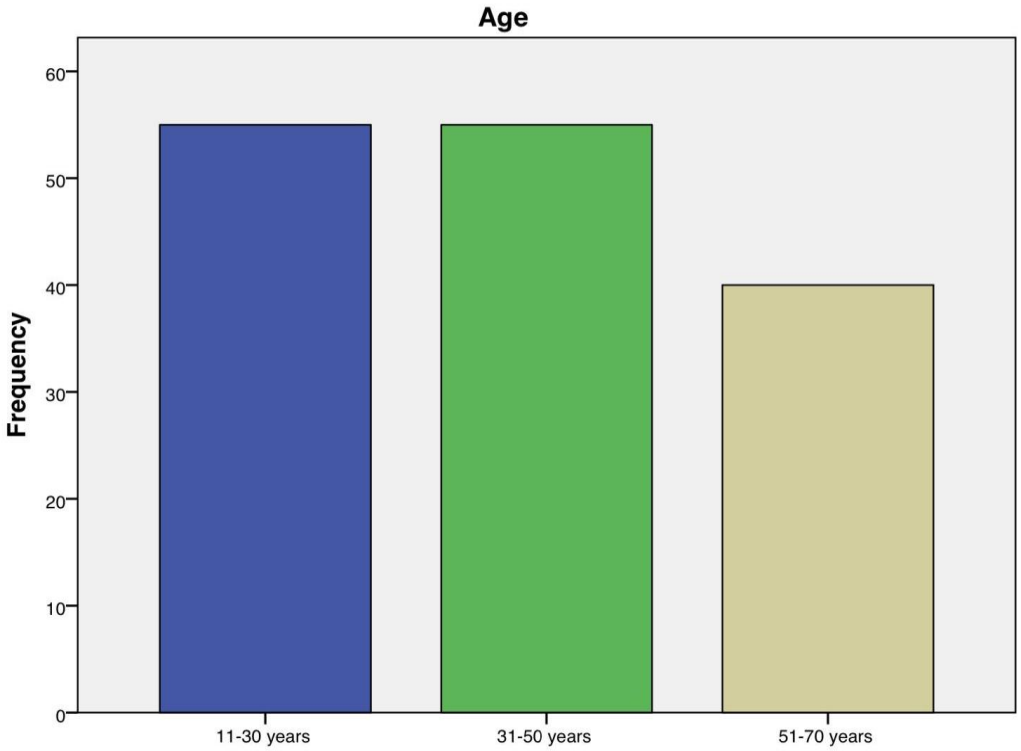

Figure 1: Bar chart depicting the age groups taken for the present study. It was found that about 35.7% were seen in the age groups 11-30 (blue) and 30-50 years (green). And in the age groups 51-70% about 26.7% (beige) were used for the study.

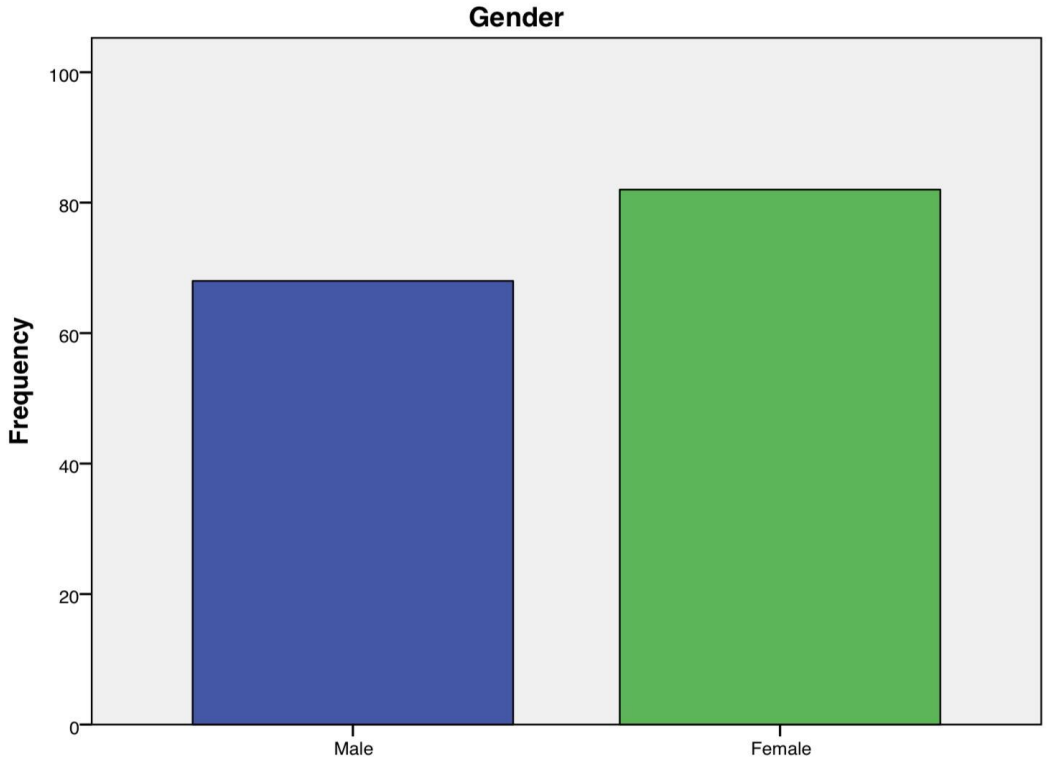

Figure 2: Bar chart depicting the gender population used for the present study. About 45.3% were males (blue) and 54.7% were females (green) used for the study.

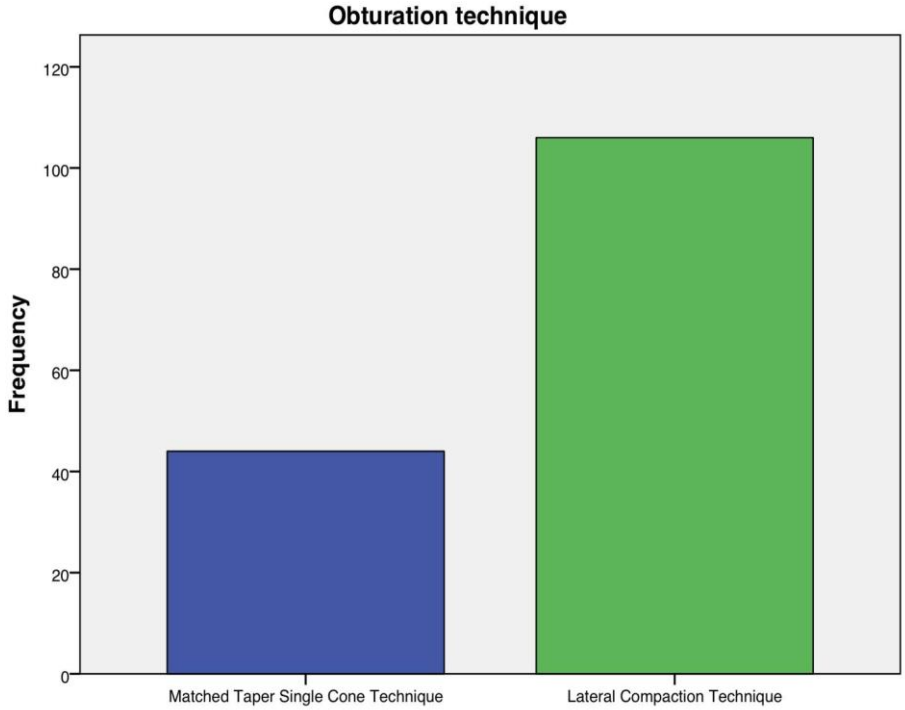

Figure 3: Bar chart depicting the obturation techniques used for the present study. About 29.3% were found to have used matched single cone (blue) technique and about 70.7% were the lateral compaction technique (green) in the present study.

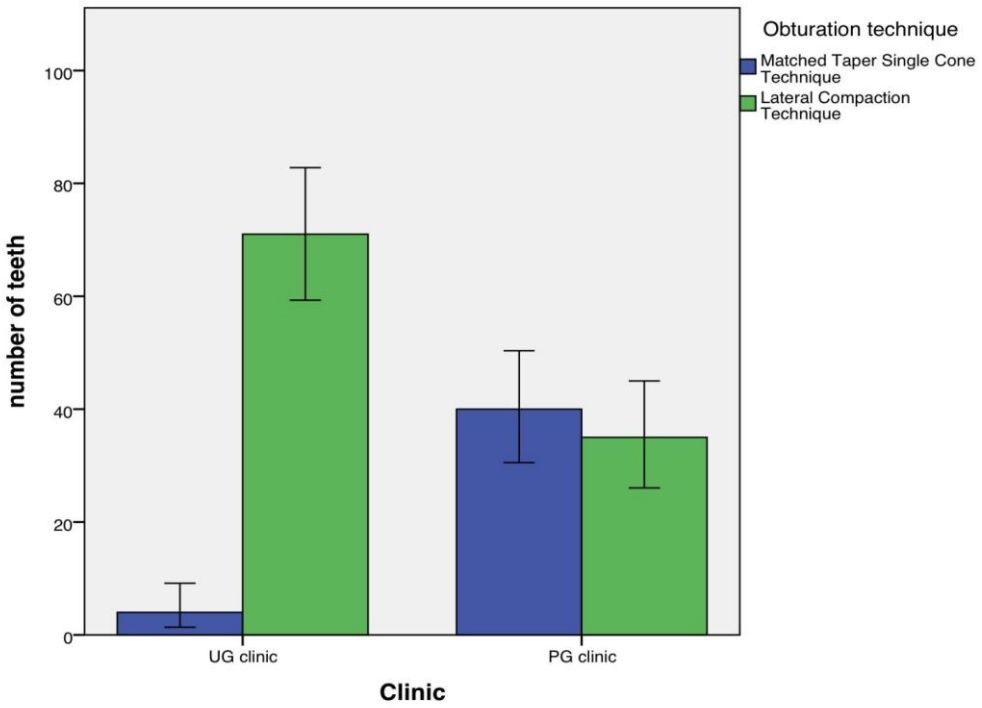

Figure 4: Bar chart depicting the association between the type of clinic (UG clinic or PG clinic) and the type of obturation followed in each clinic. X axis denotes type of clinic and Y axis denotes number of teeth. Blue denotes matched taper single cone technique and Green denotes lateral compaction technique. Lateral compaction technique was used more frequently in UG clinics whereas matched single cone technique in PG clinic. This association was found to be statistically significant (Chi square test p value=0.00<0.05, statistically significant)

IV. DISCUSSION:

Complete cleaning and shaping of root canal followed by proper obturation with a biocompatible material is the key to success for any endodontic therapy.(31) The purpose of the process of obturation is to completely seal the root canal space to prohibit the leakage or penetration of any material or fluid or any microorganisms into the peri-apical areas and zone.(32) All the techniques available for obturating teeth during the final phase of endodontic therapy have their own advantages and limitations.(32,33) The higher use of matched single cone technique in PG clinics as seen in this study can be attributed to the more frequent use of rotary endodontics in postgraduate training as compared to the undergraduates.

De Moor et al analyzed the efficacy of epoxy resin root canal sealer (AH26) when used for obturating teeth with different obturating techniques. They observed that in the time period of upto 4 months of observation, significantly higher leakage was found to be associated with Thermafil groups. From the results, they concluded that in comparison to the other four obturating techniques, hybrid gutta-percha condensation technique was to be superior.(34) De-Deus et al evaluated the GFA in the teeth obturated with Thermafil or lateral condensation technique. They observed that in between the Thermafil System and both System B and lateral condensation techniques, significant differences were obtained while comparing the mean GFA. From the results, they concluded that significantly higher GFA occurs with Thermafil technique of obturation.(7,34) the authors concluded that minimum voids are exhibited by Thermafil obturation technique in comparison with other latest techniques. However, future studies are recommended.

In comparison of two techniques for obturation of root canals in previous studies. Mechanical lateral condensation and conventional lateral condensation for gutta percha obturation in the root canal. They concluded that both the techniques are effective in sealing the root canal. MLC is found to be more effective than the conventional lateral condensation technique. Shan HO et al, in his study concluded that WV compaction and UL compaction produced a significantly denser gutta-percha root filling than cold lateral compaction. The density of gutta-percha was observed to increase towards the coronal aspect when the former two techniques were used.

Naseri M et al concluded that none of the root canal filled teeth were gap-free. GF , and CLC techniques showed the highest and lowest VP of obturation materials, respectively. Olcktal et al concluded that lateral condensation of cold gutta-percha can guarantee a similar seal of canal fillings as can be achieved by using thermal methods, in the round canals. Gordon MP et al concluded that the .06 taper single cone technique was comparable with lateral condensation in the amount of gutta-percha occupying a prepared .06 tapered canal. The .06 single cone technique was faster than lateral condensation.

V. CONCLUSION:

From the present study, it can be concluded that a higher percentage of lateral compaction was found in all the age groups and among the female population taken for the present study. Lateral compaction was more frequently performed in UG clinics than PG clinics. Both the techniques which were taken for the present study has its own advantages and disadvantages. Therefore all factors must be considered before deciding on the obturation technique for better prognosis of the root canal therapy.

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CONFLICT OF INTEREST:

The authors declare that there were no conflicts of interest in the present study.

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