COMPARATIVE ANALYSIS OF FOUR ROOT END FILLING MATERIALS ON APICAL MICROLEAKAGE AN IN -VITRO STUDY

By

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Dissertation Submitted To
Shri Dharmasthala Manjunatheshwara University,Dharwad, Karnataka

In partial fulfillment
of the requirements for the degree of

MASTER OF DENTAL SURGERY (M.D.S)

in

CONSERVATIVE DENTISTRY AND ENDODONTICS

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2021-2024

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ABSTRACT

Title: Comparative analysis of four root end filling materials on apical microleakage an in-vitro study.

Background & Objectives: Several studies have quoted that inadequate apical seal is the leading cause of surgical endodontic failure. Therefore, one of the important criteria of a root end filling materials must be to provide good apical sealing property, as it increases the prognostic factor of periradicular surgery. Thus, the objective of this in-vitro study was to quantitatively evaluate and compare the sealing ability of GIC TYPE IX, MTA PLUS, BIODENTINE and CENTION N as root end filling materials.

Materials and Methodology: Sixty extracted mandibular first premolars were collected for this study. After decoronation, biomechanical preparation was done up to F2 protaper system and obturation using respective gutta percha and AH plus sealer. Apicoectomy of 3mm was done with respect to all samples followed by root and cavity preparation and retro-filling with four root end filling materials namely- group I: GIC TYPE IX, group II MTA PLUS, group III: BIODENTINE and group IV: CENTION N respectively. All the samples were then subjected to dye penetration test using rhodamine B dye followed by stereomicroscopic evaluation to compare the apical microleakage.

Result: Descriptive statistics like mean, median, standard deviation and Inter-quartile range were used to describe the linear dye penetration. The test revealed that all the groups showed some degree of apical microleakage.

Kruskall-Wallis ANOVA test was done to make overall comparison between the four groups at 5% level of significance ($p<0.05$). Group III: BIODENTINE showed the least average apical microleakage (1.57mm) amongst the four groups and group II: MTA PLUS showed the highest average apical microleakage (2.53mm) with statistically significant results.

Pair wise comparisons between groups was done using Mann-Whitney U test. Group I: GIC TYPE IX (1.72mm) and group IV: CENTION N (1.71mm) showed comparable results to BIODENTINE with no statistically significant difference among them. On the other hand, all the three groups: TYPE IX GIC, BIODENTINE and CENTION N showed statistically significant results when compared to MTA PLUS which displayed the highest apical microleakage amongst the four tested groups.

Conclusion: From the result of the study it can be concluded that CENTION N can be used as an alternative root end filling material with comparable sealing property to BIODENTINE. However, BIODENTINE has shown the least apical microleakage compared to other materials used in the study.

Keywords: Endodontic surgery; Root end filling materials; Apical microleakage; Dye penetration test.

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