"COMPARISON OF SEALING ABILITY OF MINERAL TRIOXIDE AGGREGATE, GIC, IRM WHEN USED AS ROOT END FILLING MATERIAL — AN IN VITRO CONFOCAL LASER SCANNING MICROSCOPIC STUDY"

by

DR. HARSHA PUJARI

Dissertation Submitted to the
Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

In partial fulfillment
of the requirements for the degree of

MASTER OF DENTAL SURGERY (M.D.S.)

in

CONSERVATIVE DENTISTRY & ENDODONTICS

Under the guidance of

Dr. PRIYA HORATTI
Professor

DEPARTMENT OF CONSERVATIVE DENTISTRY & ENDODONTICS
S.D.M. COLLEGE OF DENTAL SCIENCES & HOSPITAL, DHARWAD
April 2011

ABSTRACT

Background and Objectives: Root end filling is the procedure by which an inert non-toxic material is packed into the root canal through an apical cavity. The main objective of a root end filling material is to provide an apical seal that prevents the movement of bacteria and the diffusion of bacterial products from the root canal system into the periapical tissues. Various studies in past have proved MTA to be the best among all the root end filling materials. The aim of this study was to compare the microleakage of three root end filling materials MTA, GIC and IRM using fluorescence dye under Confocal Scanning Microscope.

Material and Methods: Thirty extracted, human single – rooted teeth were collected. The clinical crown of each tooth was removed at the cementoenamel junction.The instrumented canals were obturated with laterally condensed gutta-percha. After removal of the coronal 2mm of filling material, the access cavities were closed with cavit. The roots were then wrapped in moist gauze and stored in a closed glass bottle at room temperature and 100% humidity for 1 wk. Apical root resections were then performed by removing 3 to 4 mm of the apex with straight fissure bur in a high speed handpiece with water coolant. Apical cavity preparations were made in each of the roots. The selected roots were then randomly divided into three groups of 10 roots each according to the material used i.e. Group 1 - the apical preparations were filled with IRM , Group 2 - the apical preparations were filled with GIC, Group 3 - the apical preparations were filled with MTA. All the roots were then immersed in an aqueous solution of acridine orange dye for 24h.Using a slow speed

diamond disk each root was longitudinally sectioned into two halves and seen under the confocal microscope.

Results: In the present study, the root end cavities filled with IRM had the lowest degree of adaptation to the dentinal walls, while the best adaptation and least amount of gaps were found in cavities filled with the MTA and GIC.

Interpretation and conclusion: Within the limitations of this study, we can conclude that

1) MTA and GIC have the potential of being used as a root end filling material as compared to IRM. By using confocal microscope lesser leakage was seen in these two materials as compared to IRM.

Keywords: Confocal Scanning Microscope, Mineral trioxide aggregate, Acridine orange