"STEREOMICROSCOPIC DYE PENETRATION STUDY EVALUATING THE SEALING ABILITY OF THREE DIFFERENT FURCATION REPAIR MATERIALS"- AN IN VITRO STUDY

by

DR. DIVYA SHETTY

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.MAHANTESH YELI
Professor

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

April 2011

ABSTRACT

Background and Objectives: Perforations have been found to be one of the most eminent cause of endodontic failures. Perforations of the root walls may be induced by iatrogenic causes, resorptive processes, or caries. The prognosis of endodontically treated teeth with perforations depends on factors such as the time lapsed before obturating the defect,the location of the perforation, adequacy of the perforation seal, size of the perforation and the material used to seal the perforation. Numerous materials have been recommended for the repair of perforations including gutta-percha, amalgam, indium foil, calcium hydroxide, tricalcium phosphate, cavit, zinc oxide eugenol, hydroxyapatite and plaster of paris. The objective of the present study is to evaluate the sealing ability of MTA when used as a furcation repair material and to compare its sealing ability with Light cured GIC and Cavit

Materials and methods: Forty eight freshly extracted mandibular and maxillary molars with non fused and well developed roots were collected. The forty eight teeth that were collected were then randomly divided into four groups of twelve teeth each. Group 1 furcation perforations were treated with MTA, Group 2 furcation perforations were treated with Light cured GIC (KETAC N-100), Group 3 furcation perforations were treated with Cavit and Group 4 furcation perforations were left untreated and were considered as positive controls. Access cavity were prepared on all the three expeimenal groups and the positive controls. The pulp chamber and the root canals were debrided of the pulp tissue remnants and debris. Perforations were then made in the centre of the pulp chamber floor with a NO.2 round bur. The width of the perforations were standardized to the diameter of a NO.2 round bur and the length

depended on the dentin-cementum thickness from the floor to the furcation area. A moist cotton pellet which did not act as a matrix for the repair material was placed in the furcation area to simulate a wet clinical field.

The pulp chamber and the access preparations of all these 4 groups were filled with visible light activated composites, and all teeth were coated with two layers of nail polish except for 1-2 mm around the furcation perforations.

All these teeth were then kept in the incubator at 37^0centigrade for 24 hours to allow for all the furcation repair materials to completely set. All the teeth were then immersed in 2% methylene blue dye for 48 hours and after removal from the dye , the teeth were then rinsed in water and dried at room temperature for 24 hours. The teeth were then sectioned bucco-lingually with the help of a diamond disc and the sections were then evaluated under the stereomicroscope to evaluate the amount of dye penetration.

The data were then analysed statistically with Kruskal Wallis test and pair wise comparisons of the four groups were also done.

Results: The sealing ability of MTA was found to be better than the sealing ability of Light cured GIC and Cavit. MTA and Light cured GIC showed statistically insignificant results when compared to MTA and Cavit & GIC and Cavit.

Conclusion and interpretation: Sealing ability of Cavit was inferior to the sealing ability of MTA and of Light cured GIC. Sealing ability of Light cured GIC was statistically similar to the sealing ability of MTA.

Keywords: Sealing ability, MTA, Light cured GIC, Cavit,