

## **ABSTRACT**

### **AIM:**

The aim of this study was to comparatively evaluate the sealing ability and cytotoxicity of Bone cement, MTA and Biodentine as retro filling material.

### **MATERIALS AND METHODS:**

#### **SEALING ABILITY -**

Fifty sound maxillary central incisors were chemico-mechanically prepared and obturated. Three millimeters of root end were resected and 3 mm retro cavity preparation was done using ultrasonic retro tips. The samples were divided into five groups of ten specimens each; Group A-Bone Cement, Group B-MTA and Group C-Biodentine, Group D- Positive Control, Group E- Negative Control. After retrofilling, the teeth were stored in humidifier and later coated with nail varnish except at apical 1 mm. After drying the specimens, they were immersed in 0.5% Rhodamine –B dye for 48 hours. The teeth were rinsed under water for 5 minutes and sectioned longitudinally. All the samples were evaluated under LSM 510 Meta confocal microscope for determining the dye penetration in micrometers.

#### **CYTOTOXICITY-**

Bone cement, MTA, Biodentine was evaluated for cytotoxicity by preparing their extracts and incubated at 37°C under control humidified atmosphere in an incubator for 24 hours till they set. The set materials were immersed in Dulbecco Modified Eagle culture medium for 24 hours. L929 mouse fibroblasts cultured in Dulbecco Modified Eagle medium were used as control group. The extracts of test materials were then separated and tested in culture wells in close proximity to growing cell culture and incubated for 24 hours. Cytotoxicity was estimated by MTT assay where the optical density was absorbed at 540 nm and evaluated under inverted phase contrast microscope. All statistical analysis was done using SPSS version 16 using Anova and Post-hoc test.

**RESULTS-** Evaluation of sealing ability revealed that the mean micro leakage was significantly higher in MTA followed by Bone cement and least with Biodentine.

Evaluation of cytotoxicity of three different cements revealed that the cell viability of Biodentine was greater than Bone cement followed by MTA.

**CONCLUSION-** Bone cement provided an excellent seal and biocompatibility and at the same time it provided comfortable handling properties, which could overcome potential disadvantages as faced with MTA. Thus promising it a good retrograde cement which can be used in future. However Biodentine remains to be the best in terms of both sealing ability and biocompatibility when compared with other two cements.

**KEY WORDS:** Bone cement, MTA, Biodentine, Sealing ability, Cytotoxicity, Confocal microscope.