



**“EFFICIENCY OF RESTORATIVE MATERIALS IN SEALING  
FURCATION PERFORATION IN DECIDUOUS MOLAR: AN  
IN-VITRO STUDY”**

By

**DR. ABDUL RAHIMAN RAMEEZ**

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Under the guidance of

**DR. ANAND. K.TAVARGERI**

**PROFESSOR AND HEAD**

**DEPARTMENT OF PEDIATRIC AND PREVENTIVE DENTISTRY  
S.D.M. COLLEGE OF DENTAL SCIENCES & HOSPITAL, DHARWAD**

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## **ABSTRACT**

**Introduction:** Perforations are iatrogenic complication that occurs during root canal treatment accounting for second most common cause of endodontic treatment failure. Although the deciduous teeth are in time replaced by the succedaneous teeth, but their presence facilitates proper alignment, spacing and occlusion of the permanent teeth. Hence molar perforations should be repaired and preserved, which serves as a natural space maintainer, until their normal time of exfoliation.

**Aims:** To compare the sealing ability of Glass ionomer cement, Mineral Trioxide Aggregate and Biodentine when used in repair of furcation perforation in deciduous molar.

**Materials and Methods:** This study was undertaken in SDM college of Dental Sciences and Hospital and Agriculture University, Dharwad, using seventy five deciduous molar teeth. Conventional access opening were prepared using high-speed airtor handpiece. External surface of tooth was coated with a layer of nail varnish to prevent the ingress of dye. Perforation was made at the center of the pulpal floor using standardized No.4 round bur. Study samples were divided into following groups.

GROUP A- Positive control: perforation without repair

GROUP B- Negative control: sound teeth with no perforation

GROUP C- perforation sealed with GIC

GROUP D- perforation sealed with MTA

GROUP E- perforation sealed with Biodentine

Throughout the procedure moist cotton pellet was placed between the roots to simulate periodontal ligament. Access cavity was restored with composite resin. Samples were



submerged in 2% Rhodamine B dye for 48hrs followed by which they were sectioned longitudinally parallel to the long axis of the tooth through the furcation using double sided diamond disc and evaluated for linear dye penetration using stereomicroscope.

Data were expressed as percentage of microleakage scores. Furcation thickness data was subjected to the Kruskal-Wallis analysis of variance ( $p$  value $<0.05$ ). Inter-Group comparison between the experimental group was done using chi-square test( $p$  value $<0.05$ ). The statistical calculations were executed using the SPSS v2.0 statistical software.

**Results:** All the material in the present study showed microleakage. Maximum leakage was seen with Biodentine (73.33%), least microleakage was seen with MTA (46.66%) and GIC showed intermediate leakage (66.66%). Chi square test showed no statistical significance between the materials and Kruskal-Wallis Test showed no significance difference between the furcation thickness between the groups.

**Conclusion:** Within the limitations of this study it can be concluded that GIC, MTA and Biodentine have comparable results and all the three materials can be efficiently used in sealing the perforation. Further studies are recommended to develop better technique, to control the flow of the material, during perforation repair to achieve hermetic seal.

Biodentine looks promising material as it has similar properties to that of MTA but more research should be undertaken to prove its efficacy in sealing the perforation defect.

**Key words:**

*GIC; MTA; Biodentine; Microleakage; Sealing ability; Furcation; Perforation.*