

**The Effect of Various Endodontic Irrigants on the
Sealing Ability of Biodentine and Other root
Perforation Repair Materials: (In Vitro Study)**

A Thesis

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Abstract

The aim of this study was to evaluate the effect of various endodontic irrigants (sodium hypochlorite, ethylene diamine tetracetic acid and normal saline) on sealing ability of (Biodentine, mineral trioxide aggregate, and amalgam) used to repair furcal perforations.

One hundred and twenty extracted human molars (lower six and seven) with divergent roots were used in this study. A standard root canal access cavity was prepared in each tooth and furcal perforation was made and was standardized by using k file size 100 instrument to get a perforation of (1.32mm) in diameter .The teeth were randomly divided in to three groups of 40 teeth each according to the type of material used to repair the perforations and as follow:

Group A: The furcal perforations were repaired with Biodentine

Group B: The furcal perforations were repaired with MTA

Group C: The furcal perforations were repaired with Amalgam.

All the teeth were kept in the matrix that simulated the bony socket using the manikin throughout the repairing procedure. Each group was then subdivided into 4 subgroups according to irrigation regimens applied over the repair site as follow:

Subgroup 1: without irrigation .

Subgroup 2: the pulp chamber was gently irrigated with 10 mL 5.25% Sodium hypochlorite for 10 minutes

Subgroup 3: pulp chamber was gently irrigated with 10 mL 17% Ethylene Diamine Tetracitic Acid for 10 minutes.

Subgroup 4: pulp chamber was gently irrigated with 10 mL normal saline for 10 minutes .

All the teeth were left to dry for 24 hour and the teeth were filled with temporary filling.

Each tooth was coated with two layers of nail varnish and then sticky wax except 1 to 2 mm around the perforation site. Each tooth was placed in glass vial containing 3 ml of buffered Methylene blue dye at (37°C, pH 7) and kept in An incubator for 72 hour at 100% humidity. After dye application, the teeth were washed in running water for 5 min. Each tooth was sectioned longitudinally in a bucco lingual direction. The direction was parallel to the long axis of the tooth and through repaired perforation using diamond disk. Linear dye penetration was measured using a stereomicroscope.

The results showed that group A in which perforation repaired with Biodentine has least mean of dye penetration and the difference was highly significant with group C in which perforation repaired by amalgam and non-significant with group B which used MTA to repair furcal perforations.

Saline and NaOCL increase the sealing of all groups while EDTA significantly increased the dye penetration of Biodentine and MTA respectively.