

BOND STRENGTH OF ENDOREZ ROOT CANAL FILLING TO DENTIN AFTER DIFFERENT IRRIGATION PROTOCOLS

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ كُنَّا إِلَّا مَا عَلَّمْتَنَا

إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

الْعَظِيمُ

سورة البقرة

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Prevention of leakage from the oral cavity and the periradicular tissues into the root canal system and entombing any microorganisms that could not be entirely removed during cleaning and shaping procedures are the main objectives of the canal space obturation.

The ideal root canal filling material should have acceptable physico-chemical properties that allow 3D obturation of the root canal system. These properties include; insolubility in oral fluids, good adaptation to canal walls, elimination of voids and gaps, strengthening the root canal, and ease of placement and removal. Beside this, these materials should not shrink and should bond effectively to the root canal walls and the core root filling material. Adhesion of root canal sealers to root dentin is a clinically desirable property that is gaining wide interest worldwide. Upon introduction of adhesive root filling materials, it was claimed that methacrylate based sealers could minimize leakage by increasing the seal between the core root filling material and the root canal walls.

Adhesive root canal obturation systems have been recently introduced to endodontics with a specific focus on obtaining a "monoblock" in which the core material, sealing agent, and root canal dentin form a single cohesive unit. This aim has been hampered by the lack of chemical union between the polyisoprene component of gutta-percha and methacrylate-based resins. One of the strategies used to circumvent this problem, was coating gutta-percha cones with a polybutadiene-diisocyanate-methacrylate adhesive. This proprietary adhesive resin includes a hydrophobic

portion that is chemically compatible with the hydrophobic polyisoprene substrate and a hydrophilic portion that is chemically compatible with a hydrophilic methacrylate resin. With the use of this adhesive resin coating, a strong chemical union is achieved between the gutta-percha and the methacrylate resin-based sealer. This thermoplastic resin-coated gutta-percha cone is recommended for use with the hydrophilic EndoREZ sealer.

The use of some disinfectant solutions or medications during root canal preparation may have an adverse effect on adhesion of root canal filling materials to root canal dentin ^(61, 73). The removal of the smear layer before filling the root canal system may enhance the ability of filling materials to enter the dentinal tubules ^(63, 66, 74). This may increase the adhesive strength of sealers to dentin, thus improving the sealing ability of the filling. However, others found higher bond strengths when the smear layer is present ⁽⁶⁹⁾.

The effect of irrigating solutions on the bond strength of filling materials to dentin is not the same for all root canal filling materials. Therefore, different sealer types require different dentin pretreatment for optimal adhesion. However, the effect of irrigating solutions on bonding of root canal filling materials to dentin is still unclear and requires further investigations.

The purpose of this study was to:

1. Evaluate the effect of using different combinations of irrigating solutions on bond strength of EndoREZ root canal filling material.
2. Investigate the mode of bond failure in the system.



INTRODUCTION
