

Effect of triple Antibiotic paste and 2% chlorhexidine gel on shear bond strength of composite resin to dentin; an in vitro study

Endodontic instrumentation alone cannot achieve a sterile condition. The use of effective intracanal medication is approved by several studies as an important procedure for bacteria reduction.^[1,2] Triple antibiotic paste (TAP) containing metronidazole, ciprofloxacin, and minocycline has been reported to be a successful regimen in controlling the root canal pathogen and in managing non-vital young permanent tooth.

Chlorhexidine is a broad-spectrum anti-microbial agent against microorganism isolated from refractory endodontic infection resistant to conventional therapy with Calcium hydroxide.^[3] Composite resins, with or without using resin fiber post in anterior teeth, are being used as a common approach to restore and to reinforce endodontically root canal treated teeth.^[4]

In this in vitro study, 36 of premolar teeth freshly extracted adult human were selected. The teeth were embedded in auto-polymerizing acrylic resin (Acropars-iran). The teeth were divided into three main groups including control (normal saline), chlorhexidine gel 2% (Consepsis, USA) and triple antibiotic paste. Specimens were stored at 37 °c and 100% humidity in incubator for 10 days.

Surfaces were etched with 35% phosphoric acid gel (Ultra-etch, USA) for 15s, rinsed for 15s with an air-water syringe and dried with compressed air. Single bond (3M ESPE, USA) was applied and cured with LED curing light (LED Turbo, Taiwan) for 20s. Resin composite (Z100 3M, USA) was insert into the surface by packing the material on cylindrical-shape plastic matrices. Shear bond strength was measured by Universal Testing Machine (Daytec HC.10-England). Data were analyzed by Kruskal-Wallis test. In this investigation, the shear bond strength mean in chlorhexidine group, Triple antibiotic group and control group was 25.743Mpa, 13.933Mpa and 17.25Mpa respectively. These results showed that the mean of the shear bond strength values in chlorhexidine group was higher than those in Triple antibiotic group. There was statistically no significant difference of bond strength values among the data obtained from different groups ($p > 0.05$). Various

chemical agents have an adverse effect on the dentin structure which can ultimately change the properties of different adhesives.^[5] It seems that the minocycline can react to dentin calcium molecules and preclude the penetration of monomer molecules into dentinal tubules.^[6, 7] In the present study, CHX gel increased the bond strength which agreed with the results of Santos et al.

They showed that the chlorhexidine irrigation produced mean bond strengths similar to saline solution.^[8] Sacramento et al. concluded that the chlorhexidine did not interfere with the values of micro shear bond strength.^[9] Erdemir et al. have shown the higher bond strengths with chlorhexidine irrigation is compared with other material, because chlorhexidine is absorbed in dentin and facilitate the absorption of dentin bonding agents.^[10] According to the results of present study, the chlorhexidine gel and Triple antibiotic paste didn't interference with the shear bond strength of composite resin to the dentin. However, the chlorhexidine slightly increased the mean shear bond strength.

Maryam Zare Jahromi (DDS)¹

Parvin Mirzakoucheki- Boroujeni(DDS)²

Sharareh Daneshpour(DDS)³

Mohammad Reza Saei (DDS)^{4✉}

1. Assistant Professor, Endodontics Department, Faculty of Dentistry, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan -Iran.
2. Assistant Professor, Operative Dentistry Department, Faculty of Dentistry, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan -Iran.
3. General Dentist, Isfahan- Iran.
4. Postgraduate Student, Endodontics Department, Faculty of Dentistry, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan -Iran.

✉ **Corresponding Author:** Mohammad Reza Saei, Faculty of Dentistry, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan -Iran.

Email: saei505@yahoo.com

Tel: +9803135354123

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