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Dental pulp revascularization of necrotic permanent teeth with immature apex: 24 Month follow up *in vivo* study

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Introduction: Treatment of necrotic teeth with open apex and apical periodontitis presents challenge in endodontic and paediatric dentistry. Revascularization is a recent treatment for such cases as an alternative to conventional apexification. The purpose of this study was to examine the effect of a pulpal revascularization procedure for immature necrotic teeth with apical periodontitis.

Methods: Twenty patients, each with an immature necrotic permanent tooth with apical periodontitis, were recruited. Two patients withdrew from the study because of pain experienced after placement of the antibiotic mixture due to persistence infection. In one patient, no bleeding was observed after the over instrumentation procedure. These patients have been excluded from the study and received an apexification therapy instead. Another patient dropped out through recalls after receiving complete course of revascularization treatment. Pulp revascularization procedure was performed by root canal disinfection using triple antibiotic mix (ciprofloxacin, metronidazole, and minocycline) for 1-2 weeks, followed by creating blood clot and sealing of root canal orifice using white mineral trioxide aggregate and final coronal seal with composite resin. Patients were recalled periodically for clinical and radiographic evaluation for up to 24 months.

Results: During 24-month follow-up evaluation, the patients were asymptomatic. Three cases that were initially having chronic apical periodontitis, showed clinical disappearance of sinus tract two weeks after treatment. Radiographic follow up revealed progressive resolution of periapical radiolucency within 6-12 months. Within 12-24 months, treated teeth showed progressive increase of dentinal wall thickness, increased root length and continued root development.

Conclusions: Revascularization could be effective for managing immature permanent teeth with apical periodontitis with appropriate case selection.

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