

Vital pulp therapy demystified

Therapeutic strategies for vital teeth with pulp exposure in deeply carious teeth are directed toward the preservation of pulpal vitality. For over a century, these vital pulp treatments of indirect and direct pulp capping procedures have been described.^[1]

Enhanced knowledge of pulp biology and immunity coupled with continuous clinical research has led us to a better understanding of vital pulp therapy (VPT) in matured cariously involved teeth indicative of irreversibly inflamed pulp. Pulpal inflammation can be in response to either chemical, thermal, or mechanical irritation; however, the vitality of the tooth is at risk only when the pulp tissue is invaded by microbes.^[2] However, as documented by some authors, in irreversible pulpitis cases, most of the pulpal tissue may not be infected or inflamed.^[3,4]

With the advent of new materials such as hydraulic calcium silicate cement, more predictable treatment outcomes are possible. These materials possess favorable physicochemical characteristics such as high pH, mineralization of intratubular dentin, prevention of biofilm, decline in pro-inflammatory mediators, and reduction in pain after dental procedures involving pulp.^[5,6] These effects of immunomodulation of biomaterials provide much-needed osteogenic as well as bioactive properties.^[7-9] Hence, the selection of a suitable material should be dependent on available evidence directed toward a patient-centric outcome with respect to the formation of hard tissue along with the preservation of vitality of pulp.

Documented literature suggests that success rates range from 85% to 100% at 1–2 years when permanent teeth with or without symptoms in an irreversibly inflamed pulp are managed with VPT using bioceramic materials.^[10,11]

Cushley *et al.* in 2019 stated that at 12-month patients, recall after complete coronal pulpotomy of permanent teeth affected by irreversible pulpitis due to caries, success rates of 97.4% and 95.4% clinically and radiographically were observed. However, at 36 months, there was a reduction in success rate, i.e. 93.97% clinical and 88.39% radiographic, implying a similar outcome with nonsurgical root canal treatment (NSRCT).^[12] A study by Eghbal *et al.* in 2020 demonstrated comparable postoperative pain relief after NSRCT and full pulpotomy using biomaterials in permanent teeth. The authors reported a considerable decrease in postoperative pain at 24 h in all the study groups. In NSRCT, pain reduced from 56.5% to 13.1%, whereas in the MTA group, the pain lessened from 55.7% to 10.6% and in the CEM group from 56.7% to 12.9%.^[13]

The American Association of Endodontists in 2021 published a position statement on VPT wherein they stated that irreversibly inflamed pulp tissue has the capacity to heal if the microorganisms are eliminated, even in mature permanent teeth.^[14] Hence, to conclude, VPT may be prescribed as evidence-based treatment in clinical dental practice. For a predictable, consistent, and successful outcome, decision-making is of paramount importance.

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