



EBD spotlight: Assessing cervical pulpotomy as a viable treatment option for acute irreversible pulpitis in mature permanent teeth



Manas Dave¹ reflects on topics discussed

in our sister journal *Evidence-Based Dentistry*.

The treatment of mature permanent teeth with irreversible pulpitis by cervical pulpotomy: A systematic review was published in the *Australian Endodontic Journal* in 2022.¹ A commentary on the paper was published in *Evidence-Based Dentistry* in December 2022.²

Untreated dental caries in permanent teeth is the most common health condition in the world and one of the main ways a dental pulp becomes inflamed. The ingress of bacteria (and their endotoxins) through the

dental tubules will activate the host immune response. Given the pulp is contained within a hard mineralised structure, it has no ability to expand its volume and cope with the influx of tissue fluids and inflammatory cells. The resultant increased pressure causes collapse of veins and venules, stasis of blood, ischaemia and pulpal necrosis.³ Conventionally, this is treated with root canal therapy (pulpectomy – removal of the entire pulp and then filling of the root canal system) or extraction. Histopathological studies have shown inflammatory reactions in the pulp to be

localised to the sublocation of the penetrating dental caries however pulp tissue apical to these areas tended to be normal without evidence of inflammation.⁴ Pulpotomies involve removal of part or all of the inflamed coronal pulp (partial or full pulpotomy respectively) which contains the bacterial ingress, and placing a biomaterial, leaving a vital and healthy radicular pulp. Traditionally, this technique relies on reversible pulpitis associated with caries in primary teeth or after traumatic pulp exposure in permanent teeth.^{5,6} The aim of this systematic review was to evaluate the success of pulpotomy on mature permanent teeth with irreversible pulpitis and to compare this with root canal treatment and the bioactive material used.¹

Methods

An electronic database search of PubMed and the Cochrane Library were conducted on articles published from 2000 to April 2021. Only randomised control trials (RCTs) involving mature permanent teeth with irreversible pulpitis and pulpotomies were included. Quality assessment was undertaken however the authors did not specify which risk of bias tool was used.

Results

■ Four articles were included in this systematic review; two compared root canal treatment vs full pulpotomy filled with mixture enriched with calcium. In one study, the clinical success rates for root canal treated teeth were 98.3% and 98.1%

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vs pulpotomy treated teeth at 97.6% and 98.19% at years 1 and 2 respectively. In the other study, the radiographic success rates were 70.3%–79.5% for root canal treated teeth and 92.2%–86.1% for pulpotomy treated teeth at years 1 and 2 respectively

■ Two articles compared different biomaterials as pulpotomy agents. One RCT reported the clinical and radiographic success respectively at 81.2% and 46.1% for calcium hydroxide, 83.3% and 53.3% for mineral trioxide aggregate (MTA) and 92.8% and 38.4% for platelet rich-fibrin. The other RCT respectively reported clinical and radiographic success at 98% and 95% for MTA, and 97% and 92% for mixture enriched with calcium.

Conclusions

The authors concluded:

‘...pulpotomy can be considered as a valid optional treatment for irreversible pulpitis in mature permanent teeth...’

Comments

This systematic review aimed to investigate the success of pulpotomies vs root canal treatment on mature permanent teeth with irreversible pulpitis and also aimed to investigate the effectiveness of the biomaterial used. Both questions hold merit however only one question should be answered in a systematic review. There are several other limitations of this systematic review, to list a few; the authors did not follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, only two databases were searched, the key words used were limited in the searches, the risk of bias tool was not mentioned, no quantitative analysis (meta-analysis) was performed, and the conclusions were drawn from a limited number of studies and only addressed one of the initial questions asked (no concluding remarks were made about any biomaterials). The methodological rigour of this systematic review is not of sufficient quality to inform clinical practice or accept the conclusions.² Interestingly, there are clinical

trials ongoing to investigate pulpotomies in permanent teeth with irreversible pulpitis.⁷ At present, the European Society of Endodontology has highlighted the need for long-term evidence before recommending pulpotomies as a substitute for root canal therapy.⁸

References

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