

The best treatment for avulsed permanent teeth

Abstracted from

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Interventions for treating traumatised permanent front teeth: avulsed (knocked out) and replanted. Cochrane Database Syst Rev 2010; issue 1

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Question: What is the best treatment option for permanent teeth with avulsion injuries?

Data sources The Cochrane Oral Health Group's Trials Register, Cochrane CENTRAL, Medline and Embase were consulted, along with the websites www.clinicaltrials.gov and www.controlled-trials.com and reference lists of identified articles. There were no language restrictions.

Study selection Only randomised controlled trials that included a minimum followup period of 12 months for interventions dealing with avulsed and replanted permanent teeth were considered.

Data extraction and synthesis Two review authors independently extracted data and assessed trial quality and the risk of bias in studies to be included.

Results Three studies (involving, in total, 162 patients and 231 teeth) were included. Study one (high risk of bias) investigated the effect of extra-oral endodontics. This showed no significant difference in radiographic resorption compared with intra-oral endodontics provided at week 1 for teeth avulsed for longer than 60 min dry time. Study two (moderate risk of bias) investigated a 10-min soaking in thymosin alpha 1 prior to replantation and then its further use as a daily gingival injection for the first 7 days. They reported a strong benefit at 48 months (14% with periodontal healing in the control group versus 77% for the experimental group). Study three (high risk of bias) investigated a 20-min soaking with gentamycin sulphate for both groups prior to replantation and then the use of hyperbaric oxygen daily in the experimental group for 80 min for the first 10 days. They reported a strong benefit at 12 months (43% periodontal healing versus 88% for the experimental group). There was no formal reporting of adverse events.

Conclusions The available evidence suggests that extra-oral endodontic treatment is not detrimental for teeth replanted after more than 60 min dry time. Studies with moderate/ high risk of bias indicate that soaking in thymosin alpha 1 and gentamycin sulphate followed by hyperbaric oxygen may be advantageous but these strategies have not previously been reported as interventions for avulsed teeth and await further validation. More evidence with low risk of bias is required and, with the low incidence of avulsed teeth, collaborative multicentre trials are indicated.

Commentary

Currently, 0.5–3.0% of children world-wide suffer dento-alveolar trauma to permanent teeth¹ and 8% of dental trauma incidents are complete avulsion of teeth, which require reimplantation as quickly as possible to ensure that most of these children keep their smiles.² There is uncertainty, however, over how best to prepare teeth for reimplantation because of the risk of pulp necrosis, ankylosis, root resorption, infra-occlusion during adolescent growth and infection.³ The damage to the periodontal ligament at the time of injury, the conditions of a tooth's subsequent storage and the length of time prior to replantation, and incomplete root formation all profoundly influence the prognosis.³ This injury carries one of the poorest outcomes for dento-alveolar trauma, with 73–96% of replanted teeth eventually being lost.¹ This systematic review addresses a very important subject: what is the best treatment option for permanent teeth with avulsion injuries?

The aim of the systematic review is clear as are the databases and search strategies. Among the three included studies,^{4–6} two had high a risk of bias^{4,5} and one had moderate risk for bias,⁶ looking at method of randomisation, allocation concealment, blinding of participants and personnel, incomplete outcome data and selective outcome reporting.

The available evidence indicates that for teeth with little chance of periodontal healing (more than 60 min dry time) a root canal treatment can be carried out before the tooth is replanted without further detrimental effects.

Although two studies^{4,6} suggest that immersing the tooth in immune response enhancer or antibiotics does improve the chance of periodontal and pulp healing, this is controversial.⁷ Nevertheless, thymosin alpha 1 and gentamycin sulphate followed by hyperbaric oxygen may be advantageous although, as they have not yet been reported as interventions for avulsed teeth, they still require validation. Readers are advised to read specific reviews on the subject.

Interestingly, none of the three studies formally reported any side-effects for the different interventions and the main message to clinician is to interpret these results with caution before translating them into practice.

This paper is based on a Cochrane Review published in the Cochrane Library 2010, issue 1 (see www.thecochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and the Cochrane Library should be consulted for the most recent version of the review.

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