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[Intervention Review]

Interventions for treating traumatised permanent front teeth: avulsed (knocked out) and replanted

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ABSTRACT

Background

Dental trauma is common. One of the most severe injuries is when a permanent tooth is knocked completely out (avulsed) of the mouth. In most circumstances the tooth should be replanted as quickly as possible. There is uncertainty on how best to prepare teeth for replantation.

Objectives

To compare the effects of a range of interventions for managing traumatised permanent teeth with avulsion injuries.

Search methods

The Cochrane Oral Health Group's Trials Register (to 28th October 2009); CENTRAL (*The Cochrane Library* 2009, Issue 4); MEDLINE (1950 to October 2009); EMBASE (1980 to October 2009); www.clinicaltrials.gov/; www.controlled-trials.com/ and reference lists of articles were searched. There were no language restrictions.

Selection criteria

Only randomised controlled trials (RCTs), that included a minimum follow-up period of 12 months, for interventions for avulsed and replanted permanent teeth were considered.

Data collection and analysis

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

Main results

Three studies, involving a total of 162 patients and 231 teeth were identified. Study one (with a 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 minutes dry time. Study two (which had a moderate risk of bias) investigated a 10-minute 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 (with a high risk of bias) investigated a 20-minute soaking with gentamycin sulphate ($4x10^7$ U/L) for both groups prior to replantation and then the use of hyperbaric oxygen daily in the experimental group for 80 minutes 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.

Authors' conclusions

The available evidence suggests that extra-oral endodontics is not detrimental for teeth replanted after more than 60 minutes 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 however, they have not previously been reported as interventions for avulsed teeth and need further validation. More evidence with low risk of bias is required and, with the low incidence of avulsed teeth, collaborative multicentre trials are indicated.

PLAIN LANGUAGE SUMMARY

Treatments for managing knocked out and replanted front teeth

Injuring your front teeth during childhood is common. One of the most severe injuries occurs when the tooth is knocked totally out of the mouth (avulsed). Often the best option is to replant the tooth as quickly as possible. This is true only for permanent teeth. Once replanted the tooth can heal in two ways if managed correctly. Ideally the ligament around the root reforms and the tooth can be expected to last as long as any other tooth, this is known as 'periodontal healing'. When there is too much damage to the ligament, healing occurs by bony replacement and the tooth is replaced by bone and lost over a few years. This is called 'bony healing'.

Bony healing causes significant problems in the medium term for children and treatments for this are the subject of a different Cochrane review. A missing front upper tooth or teeth, as a result of not replanting an avulsed tooth or as a treatment for bony healing, can have a major effect on dental and facial 'good looks'. This can affect the individual's self esteem and general social interaction, as well as how others think and see them.

This Cochrane review investigated what treatments encourage the tooth to repair by periodontal healing. Three studies were found. The benefits of these treatments require further investigation before specific medicaments can be advised. This is because the studies had weakness in their design which may have influenced the benefits they found. The following general treatment principle can be concluded which reinforces current treatment guidelines: For teeth with little chance of periodontal healing, a root canal treatment can be carried out before the tooth is replanted without further detrimental effects.