

Reimplanted teeth in children—the major risk factors for resorption

Variations in the presenting and treatment features in reimplanted permanent incisors in children and their effect on the prevalence of root resorption by M. J. Kinirons, T. A. Gregg, R. R. Welbury and B. O. I. Cole
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Objective

To examine variations in the presentation and treatment of reimplanted incisors in children and to determine the effect of these on the prevalence of external root resorption.

Setting

Departments of Paediatric Dentistry, Belfast and Newcastle upon Tyne.

Design

Recording of the timing of the injury and the storage mediums (including air) and of reimplantation, the stage of root development, the degree of contamination and the time of commencement of root treatment. Cases were reviewed clinically and radiographically at intervals of 3 months. Root resorption was classified as present or absent. Logistic regression and cross-tabulations were produced with the presence of resorption set as the outcome.

Results

128 reimplanted permanent incisor teeth, their median dry time prior to reimplantation being 15 minutes (range 4-52 mins), the median time in a liquid medium being 45 minutes (range 0-650 mins), with a median splinting time of 15 days (range 4-52 days) and a median pulp extirpation time of 15 days (range 0-612 days). There was a lower prevalence of resorption when the period of dryness was less than or equal to 5 minutes ($p=0.025$). The prevalence of resorption in teeth with no visible

contamination was 57.1%, for those with contamination which were washed clean it was 75%, in those rubbed clean it was 87.5%, and it was 100% for those reimplanted with visible contamination still present ($p=0.014$). The corrected odds ratio for contamination was 2.99 and for an extension of 10 minutes of dryness it was 1.29.

Conclusion

The degree of contamination and the period of dryness were the major risk factors for resorption in this study of reimplanted teeth in children.

In Brief

- It was possible to examine 128 reimplanted permanent incisor teeth in children and to examine the effect of factors at presentation and during treatment on the occurrence of external root resorption.
- The study showed that there were considerable variations in the periods of dryness and storage as well as in the timing of endodontic procedures.
- It was possible to quantify the degree of contamination and its management and this factor significantly affected the risk of root resorption.
- Prolonging the period of dryness was a much stronger cause of resorption than extending the period of storage in a liquid medium.

Comment

This paper presents the results of a collaborative study between Belfast and Newcastle, combining data obtained from the management of replanted permanent incisor teeth in children.

Avulsion of permanent incisor teeth in children is rare, but by combining the experiences of two centres the study was able to include 128 replanted incisor teeth.

The results confirm that dry storage of avulsed teeth is correlated with an increased chance of root resorption. The longer the period of dry storage the more likely root resorption will occur. The results indicate that an avulsed tooth should be placed in a suitable storage medium as soon as possible after the accident in order to minimise the chances of root resorption.

A factor which has not been investigated before is the relationship between contamination of the root and root resorption. The authors state that there was a steady increase in the occurrence of root resorption; the

least resorption was seen in cases without visible contamination, intermediate levels of resorption in those washed clean, higher levels in those which were rubbed or wiped clean and the highest in those not fully cleaned prior to replantation.

Another interpretation of this association between root resorption, contamination and cleaning could be that it was the treatment for the contamination which actually promoted the root resorption. The teeth which were gently washed showed less root resorption than those which were physically rubbed or wiped. Those teeth which could not be fully cleaned were traumatised the most by the unsuccessful cleaning process.

The authors conclude that there needs to be education on the correct management of contamination of the root. I am left wondering what the correct management should be?

The authors are to be congratulated on carrying out this collaborative study.

However, the problem with this initiative is that the centres do not appear to have been following the same treatment protocols for the management of avulsed/replanted teeth, thus the results need to be interpreted with this in mind.

A point which is highlighted in the discussion is the role of published Clinical Guidelines. In my view these Guidelines could stifle clinical research because clinicians may have difficulty steering a different type of treatment through an ethical committee. In addition, if a dentist carries out treatment for a traumatised tooth which is different from the one given in the Clinical Guidelines, will the dentist be open to legal action should complications occur or anything go wrong?

Iain C Mackie

Senior Lecturer/Honorary Consultant in Paediatric Dentistry, University Dental Hospital of Manchester