

IN BRIEF

- Considers management of avulsed primary incisors.
- Reviews guidelines relating to replantation of teeth.
- Emphasises the importance of regular reviews following trauma.

Complications following replantation of a primary incisor: A cautionary tale

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The replantation of avulsed primary incisors is contra-indicated. This case describes an 8-year-old child who six years previously had avulsed and had replanted a primary central incisor. At presentation, this tooth was retained, the permanent successor had failed to erupt and appearance of the adjacent lateral incisor was notably delayed. Investigation revealed a radicular cyst in relation to the replanted deciduous incisor together with severe displacement of the permanent tooth, which could not be saved.

Whilst trauma to the primary dentition is a common occurrence ranging from 4–30%;¹ avulsion, the most extreme form of luxation injury, represents less than a fifth of such injuries, though a third of children sustaining such trauma are in the age group 2–4 years.²

Replantation of primary incisors has been carried out in some studies and reported for some individuals where the criteria adopted appear to be based on the protocol relating to replantation of permanent incisors.³ A risk-benefit assessment by review of the literature recently undertaken⁴ reveals that the perceived outcome is based largely on the descriptions and opinions contained in the sporadic case reports rather than any scientific evaluation. This is due to variations in teeth involved, extra-alveolar period and storage, splint use, radiographic examination and follow-up intervals recorded. In the

largest review of 58 avulsed primary teeth,⁵ eight incisors were replanted and followed up in excess of one year. None of the incisors had pulp extirpation prior to replantation, even though the extra oral time was in excess of 30 minutes and all were splinted. Subsequently 50% (four incisors) had to be extracted due to abscess formation or pathological root resorption whilst one was retained and the remaining three exfoliated normally. One of the succedaneous teeth had an enamel defect.

Indeed it is the complications to the deciduous tooth of pulpal necrosis, ankylosis or root resorption together with the possible consequences to the developing permanent successor of hypoplasia, morphological changes to the crown or deflection of the path of eruption that has led to the current rationale advising against such practice.

Hence, guidelines established by the British Society of Paediatric Dentistry⁶ which are in agreement with the American Association of Endodontists⁷ state: 'primary teeth should not be replanted because of the possibility of damage to an underlying developing permanent tooth'.

CASE REPORT

In September 2002, a fit and well 8-year-old boy attended regarding delayed eruption of the permanent upper right

central incisor. The history revealed emergency dental treatment some six years earlier within an hour of having fallen on a wooden floor traumatising the upper anterior teeth. The upper left central incisor had been luxated and the upper right primary central incisor avulsed. Following examination, the tooth had been replanted. No splinting had been applied and no further treatment or follow-up was undertaken.

The parent reported that approximately two years later the primary upper right central incisor began to discolour; however there were no clinical signs of infection and due to irregular attendance no care was sought. At six-and-a-half-years old the permanent upper left central incisor began to erupt. Eighteen months later at a dental examination it was noted that the contralateral tooth was still unerupted and hence referral was made to a consultant in paediatric dentistry. On examination, the oral hygiene was reasonable. The patient was in the early mixed dentition with

6 E D C B A / 1 2 C D E 6

6 E D C 2 1 / 1 2 C D E 6

present. There was caries affecting all deciduous molars and three of the deciduous canine teeth. The retained primary upper right central incisor was noted to be grey in colour and slightly mobile with bony expansion both buccally and palatally. (Fig. 1).

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Fig. 1 Occlusal view showing buccal and palatal tissue expansion associated with the discoloured and retained primary upper right central incisor

Occlusal and panoramic radiographic investigation revealed a large unilocular periapical radiolucency associated with the apex of this non-vital tooth (Fig. 2) together with a vertically displaced permanent successor. The permanent upper right lateral incisor eruption was also delayed in comparison with norms and its antimere.

A provisional diagnosis was made of a radicular cyst associated with the primary upper right central incisor secondary to pulpal necrosis resulting from trauma. Treatment consisted of extraction of both the primary upper right central and lateral incisors with enucleation of the cyst and surgical investigation of the displaced permanent upper right central incisor. Unfortunately the displaced permanent upper right central incisor, though of normal morphology, was attached to the cyst with no evidence of peripheral investing bone and hence was compromised to the extent it was deemed unsavable.

Following surgery the cyst was sent for a pathology report which confirmed that the appearances were consistent with those of a heavily inflamed radicular cyst. Upper and lower alginate impressions were taken for study models and construction of an upper space maintainer: initially to prevent the upper left central incisor from encroaching on the mid line.

The intermediate treatment regimen was to provide a more stable removable partial denture to replace the permanent upper right central incisor but this was not possible until after the eruption of the permanent upper right lateral incisor which, of normal



Fig. 2 Oblique occlusal radiograph showing a large unilocular radiolucency together with the displaced and developing permanent upper right central incisor

form, did not take place until 10 months post-operatively. This will be followed in the long term by an adhesive bridge and/or single tooth implant if appropriate.

DISCUSSION

In this case, replantation of the avulsed primary incisor was fraught with problems. The tooth having been replanted at a young age, but without follow-up, complications resulting in the loss of the permanent successor were encountered some six to seven years later. It would appear that for the sake of maintenance of a complete primary dentition future consequences were not taken into consideration at the time of replantation.

Apart from the lack of co-operation from, and psychological injury to children in this age range, most clinicians opt against replantation because of the risk to the developing tooth germ. Should such a procedure be undertaken contrary to recommendation, as a result of parental pressure, endodontic treatment and long-term follow-up is crucial.

Whilst case reports of replantation have been presented, traditionally the preservation of such severely traumatised primary incisors is considered unimportant since no significant role is believed to exist with regard to function or speech development. Though compromised aesthetics might be considered by some to have a deleterious psychological effect, replantation of primary teeth cannot be justified as being in the child's best interest in the longer term.

CONCLUSION

There have been a number of sporadic case reports in the English literature regarding the replantation of avulsed primary incisors and their management claiming a degree of success. Nevertheless, since loss of a primary incisor has little significance with regards to function, the majority of studies contraindicate replantation, due to the high risk of complications to the developing permanent successor. This case clearly demonstrates the dangers to the permanent dentition of ignoring such advice.

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