Delayed replantation of avulsed incisors in a child with cerebral palsy and epilepsy – a case report

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Abstract
This case report describes the successful dental management of a child with cerebral palsy and epilepsy who sustained both avulsion and extrusion injuries following a fall. The teeth were stored extra orally for several hours before they could be replanted. In spite of this, the teeth remain in situ almost ten years later, the patient has complained of no symptoms to date, the aesthetic result is pleasing and the function is good.

Key words: Avulsion, luxation, dental trauma, learning disability, epilepsy, cerebral palsy

Introduction
Patients with seizure disorders and those with impaired control of their movements are at increased risk of sustaining traumatic dental injuries (Holan et al., 2005). Management of such injuries and the outcomes of treatment may be influenced by medical, physical or intellectual impairments.

Avulsion of permanent incisors is a severe form of displacement injury. There continues to be debate as to the optimum management of avulsed teeth, particularly when there has been a prolonged extraoral period following avulsion (Kenny et al., 2003; American Association of Endodontists, 2004). Replantation of avulsed incisors in a child has the advantage of immediate aesthetic improvement with avoidance of a prosthesis. However, replacement root resorption often results in inhibition of vertical growth of the alveolus, ankylosis and eventual loss of the tooth. There may be additional issues to be considered in a child with intellectual impairment. These include limitation in ability to cooperate for dental treatment, on-going treatment requirements of replanted teeth and potential problems with use of a dental prosthesis should avulsed teeth not be replanted. This case report describes the management of a child with cerebral palsy and epilepsy who sustained both avulsion and extrusion injuries following a fall.

Case report
A 14-year-old boy with cerebral palsy, epilepsy, and moderate developmental delay attended the Accident and Emergency Department of a children’s hospital. He had sustained dental injuries following a fall from his wheelchair two hours previously. The maxillary left and right central incisors had been avulsed and there was gross extrusion of the maxillary right lateral incisor. The avulsed teeth had been stored in milk within minutes of their retrieval. An erupted supernumerary tooth, positioned palatal to the upper left central incisor, was also present and had been luxated. There was also an enamel/dentine fracture present on the disto-incisal edge of the maxillary right central incisor.

The poor long-term prognosis for the replanted teeth following a long extra-oral period was explained to the boy’s guardian. She requested replantation if at all possible, as an immediate albeit temporary measure, for aesthetic and functional reasons. It was judged that in view of the boy’s disabilities, he would not be able to tolerate a partial denture. The immediate treatment plan was to replant both central incisors and reposition the lateral incisor under general anaesthesia. This treatment was undertaken approximately seven hours following the time of the injury. It was decided at this stage to postpone extraction of the luxated supernumerary tooth in order to minimise the level of surgical trauma to the area and allow optimal healing of the replanted and repositioned teeth. The replanted and repositioned teeth were splinted and a five day course of oral amoxicillin was prescribed.

Two weeks later, under general anaesthesia, thorough root canal debridement was carried out on the three traumatised incisors, removing all remnants of the pulpal tissues (Figure 1). A non-setting calcium hydroxide paste was placed in the canals, the access cavities were restored with composite resin and the splint was removed. The luxated supernumerary tooth palatal to the replanted incisors was...
Figure 1. Radiograph of replanted and repositioned incisors, two weeks following injury. Necrotic pulp tissue has been removed from root canals and endodontic files are in place.

now tender to percussion and it was extracted. The patient's guardian was advised that the teeth should be regularly monitored by the local dentist. There were no reported problems and the patient was very happy with the outcome. A radiograph taken 10 months post injury showed a satisfactory result with no evidence of significant root resorption (Figure 2). At a review two years following the accident, no symptoms were reported and the teeth were in a good position and were a good colour (Figure 3). Use of gutta percha to obturate the canals was considered at this point. However, in view of the long extra oral time, the long-term prognosis of the traumatised teeth was considered to be very poor. Cooperation was not ideal and it was decided to leave the residual calcium hydroxide dressing in place.

Seven years following the accident, the patient now aged 21 years, presented ten days following a further episode of trauma, with subluxation of the upper left central incisor. He was now able to cooperate sufficiently to allow splinting of the tooth without any sedation or anaesthesia. No further treatment, other than short term placement of a flexible splint, was undertaken. He subsequently attended his local dentist for regular review.

The patient was most recently reviewed at 23 years of age - nine years and six months following the initial injury. There were no symptoms and the teeth were in a good position, with some minimal infraocclusion of the upper right central incisor. All incisors were a good colour. A high note was elicited on percussion of the upper right central incisor. Radiographs showed partial filling of the root canals, and there was evidence of some root resorption, especially involving the replanted maxillary right central incisor (Figure 4). The patient has now returned to his home country and is therefore unavailable for ongoing review by the authors.

Discussion
The long extra oral period in this case might have led to a decision not to replant the avulsed incisors. Such a decision would have been supported by reports of root resorption and eventual tooth loss in cases of delayed replantation of avulsed teeth. (Andreasen et al., 1995; Barrett and Kenny 1997). Despite the poor prognosis it was felt best to replant the teeth, even though this was likely be only as a short term measure. In view of this patient’s disabilities it was necessary to use general anaesthesia to allow replantation, splinting
Nine years and six months have elapsed since the initial trauma occurred, and the 23-year-old patient has retained all three incisors, including the avulsed maxillary central incisors, with a satisfactory level of function and aesthetics. Some root resorption has occurred, particularly involving the upper right central incisor, which also shows a minor degree of infraocclusion. Given the history and the radiographic appearance, it is thought that the resorption observed is most likely to be external inflammatory resorption. As the lamina dura along the mesial and distal aspects appears to be relatively normal, the resorption may be predominantly on the labial or on the palatal aspect of the tooth.

Replacement of the replanted maxillary central incisors by implant supported crowns may be necessary in the future. The maintenance of alveolar bone supporting the replanted teeth will be of benefit should insertion of implants be undertaken in the future.

Conclusions

This case report aims to highlight the fact that seemingly adverse conditions in relation to traumatic injuries may, in some cases, be overcome by the individual’s capacity for healing – something which is not at all predictable. In some cases, impairment may be an indication for replantation due to the inability of the individual to tolerate a partial denture, or the risks involved in using a removable prosthesis in those prone to seizures and further trauma. At some time in the future, loss of the replanted teeth is anticipated due to root resorption. Long-term follow up is therefore required in this and all cases of replanted teeth.

References


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