Dental Traumatology

Dental Traumatology 2008; **24**: e24–e26; doi: 10.1111/j.1600-9657.2008.00593.x

Aspiration of an avulsed primary incisor: a case report

CASE REPORT

Rona Leith[1], Paddy Fleming[1,2], Siobhan Redahan[3], Pat Doherty[4]

[1]Department of Public and Child Dental Health, Dublin Dental School and Hospital; [2]Dental Department, Our Lady's Children's Hospital, Dublin; [3]HSE Orthodontic Unit, Sligo General Hospital, Sligo; [4]Department of Anaesthesia, Our Lady's Hospital for Children, Dublin, Ireland

Abstract –This case report describes a 7-year-old boy who avulsed and inhaled a primary maxillary incisor. Over the next number of weeks, he developed a persistent, productive cough, which was unresponsive to antibiotic therapy. Radiographic examination revealed a small radiopaque tooth-shaped object in the right hilar lung region. The aspirated tooth was subsequently successfully removed by bronchoscopy under general anaesthetic. Despite the delay in diagnosis, there was an excellent outcome following removal of the aspirated tooth.

Correspondence to: Dr Rona Leith, Department of Public and Child Dental Health, Dublin Dental School and Hospital, Lincoln Place, Dublin 2, Ireland
Tel.: +353 1 6127303
e-mail: rona.leith@dental.tcd.ie

Accepted 5 February, 2007

Traumatic injuries occur frequently in the primary dentition with a reported incidence of 30%. Displacement injuries are more common than tooth fractures with avulsion, representing approximately 13% of injuries to primary teeth (1). In cases of primary incisor avulsion, it is not recommended to replant the avulsed tooth because of the risk of damaging the developing permanent successor that lies in close proximity to the root of the primary incisor. Avulsed primary teeth are most commonly found at the site of the accident, may occasionally be swallowed and are very infrequently inhaled. In long-term reviews of childhood aspiration, teeth have represented only 0.38% (2) and 0.29% (3) of aspirated objects. This report details an unusual case of inhalation of an avulsed primary incisor.

Case report

A 7-year-old boy was referred to the children's hospital for assessment of a persistent cough with mucopurulent sputum. Despite receiving two courses of antibiotics, his symptoms had not resolved. Careful questioning revealed a history of avulsion of a mobile maxillary primary incisor during play, some 7 weeks previously (Fig. 1). At the time of the incident, it was presumed that the tooth had either been lost at the site of the accident or swallowed. The child was admitted to hospital and as part of the work up chest radiographs were exposed. Examination of the radiographs revealed that a small radiopaque tooth-shaped object was present in the right hilar lung region (Fig. 2). There was no significant lung collapse distally. Therapeutic bronchoscopy was performed under general anaesthesia and the tooth was successfully removed from the right medial basal bronchus. On review 1 month later, the child was well with no respiratory complaints.

Discussion

Foreign body aspiration or ingestion is potentially fatal and is reported as the fourth leading cause of accidental death in children in the United States (4). The most frequently inhaled objects are food particles, particularly peanuts, other nuts and seeds (2, 3, 5). The incidence of foreign body aspiration is at its peak in 2 year olds, and is seen twice as commonly in boys as in girls (5).

Tooth inhalation associated with intraoral manipulation during general anaesthesia has been described (6). This highlights the importance of informing the anaesthetist of the presence of any loose teeth before a patient is anaesthetised so that precautionary measures may be undertaken. In addition, there have been reports of tooth inhalation following dental extraction (2, 7), although aspiration of dental instruments and materials pose a more common hazard in dental practice (8). Such incidents reinforce the need for prevention; the practicing dentist should routinely employ adequate barrier techniques and high volume aspiration.

Following aspiration, most foreign bodies become lodged in the peripheral airways. Large, sharp or irregular objects may lodge at the laryngeal inlet, especially in children less than 1 year old (9). Foreign

Fig. 1. Clinical photograph of erupting 21 site from which mobile 61 was avulsed and inhaled.

Fig. 2. Anteroposterior chest radiograph demonstrating opaque foreign body (inhaled 61) in right bronchus.

bodies may also lodge in the trachea but in most cases the inhaled object passes down into one of the main bronchi. In adults, the right bronchus is the most common site for a foreign body to lodge because of its wider diameter and more vertical disposition (2). However, in children, the impaction site of a foreign body is determined by the individual anatomy of the airway, and studies have shown that there is little difference in the distribution of inhaled foreign bodies between the right and left main bronchi in this age group (2, 3, 5). This is generally explained by the relatively symmetric bronchial angles in the paediatric airway until about 15 years of age.

Although an aspirated foreign body can remain unnoticed for a prolonged period of time, there is much evidence in the literature correlating the severity of pulmonary symptoms with the length of time the aspirated object remains present (2, 5). Early diagnosis and removal of an aspirated foreign body is therefore recommended. Holan & Ram (10) have reported a somewhat similar case to ours with unrecognised aspiration of an avulsed primary incisor in a 7 year old. As the child had a pre-existing cough, she was initially misdiagnosed as suffering from an upper respiratory tract infection and treated with antibiotics. Her symptoms persisted and it was not until her condition deteriorated and pyrexia developed that a chest radiograph was taken and revealed the inhaled incisor. The tooth was subsequently successfully removed by bronchoscopy.

Rigid bronchoscopy is considered the standard treatment for removal of aspirated foreign bodies and is generally considered safe and effective. A 99% success rate in foreign body removal has been described and subsequent healing is usually uneventful (2, 3, 5). Pins, spherical objects and teeth have been reported to be difficult to grasp, and in some cases have required an open surgical thoracotomy to be successfully removed (3, 5, 7). Complications of bronchoscopy for foreign body removal are uncommon and usually minor, but the risks are thought to increase if treatment is delayed or if the procedure is of long duration (2, 5).

The American Heart Association (11) has recently published guidelines for the acute management of foreign body airway obstruction. If the obstruction is mild and the child can cough and make some sounds, it is recommended not to interfere and to allow the victim to clear the airway by coughing or gagging, while observing for more severe signs. These airway reflexes are protective and indicate that the obstruction is incomplete. Complete airway obstruction is recognised by sudden respiratory distress. If the obstruction is complete and the child cannot make sounds, subdiaphragmatic abdominal thrusts are indicated (the Heimlich manoeuvre) for the child who is 1 year of age or older. For an infant (< 1 year), repeat a sequence of five back blows followed by five chest thrusts until the object is expelled. Abdominal thrusts are not recommended for infants. If the victim becomes unresponsive, cardiopulmonary resuscitation should be initiated. It is important to attempt to remove an object from the pharynx with caution, as blind finger sweeps can push obstructing objects further into the oropharynx.

What should a dentist do if a missing tooth cannot be accounted for following an accident? A detailed history should be recorded – an episode of choking has been shown to be the most sensitive predictive diagnostic factor in relation to diagnosis of an inhaled foreign body (5). The history might also reveal if the missing tooth has been lost externally at the site of the accident. Coughing, choking and wheezing are the most common presenting symptoms (2, 3, 5). A comprehensive oral examination with good lighting should then be undertaken and a maxillary occlusal radiograph should be exposed to exclude intrusion of the missing tooth. Intrusion injuries account for 16% of traumatic injuries in the primary dentition (1) and an intruded primary incisor may be mistakenly judged as avulsed. If it is thought that aspiration is likely to have occurred, the patient should be referred promptly for medical examination and treatment.

Conclusion

This case report highlights some important aspects in relation to prevention, diagnosis and avoidance of complications associated with aspiration of a primary

incisor. Despite a delay in diagnosis, there was an excellent outcome following removal of the inhaled tooth by bronchoscopy.

References

1. Andreasen JO. Etiology and pathogenesis of traumatic dental injuries. A clinical study of 1298 cases. Scand J Dent Res 1970;78:329–42.
2. Zerella JT, Dimler M, McGill LC, Pippus KJ. Foreign body aspiration in children: value of radiography and complications of bronchoscopy. J Pediatr Surg 1998;33:1651–4.
3. Black RE, Johnson DG, Matlak ME. Bronchoscopic removal of aspirated foreign bodies in children. J Pediatr Surg 1994;29:682–4.
4. National Safety Council (United States). Leading causes of death, an excerpt of injury facts. Available at http://www.nsc.org/product/lrs/db_leadcause03.pdf. Itasca, IL: National Safety Council; 2003. p. 10–25.
5. Ciftci AO, Bingol-Kologlu M, Şenocak ME, Tanyel FC, Buyukpamukçu N. Bronchoscopy for evaluation of foreign body aspiration in children. J Pediatr Surg 2003;38:1170–6.
6. Kenney JN, Laskin DM. Nasotracheal tube obstruction from a central incisor. Oral Surg Oral Med Oral Pathol 1989;67:266–7.
7. Ulku R, Başkan Z, Yavuz I. Open surgical approach for a tooth aspirated during dental extraction: a case report. Aust Dent J 2005;50:49–50.
8. Cameron SM, Whitlock WL, Tabor MS. Foreign body aspiration in dentistry: a review. JADA 1996;127:1224–9.
9. Darrow DH, Holinger LD. Foreign bodies of the larynx, trachea and bronchi. In: Bluestone CD, Stool SE, Kenna MA, editors. Pediatric otolaryngolog, 3rd edn. Philadelphia: WB Saunders Company; ISBN 0-7216-5246-8; 1996. p. 1390–401.
10. Holan G, Ram D. Aspiration of an avulsed primary incisor. A case report. Int J Paed Dent 2000;10:150–2.
11. American Heart Association. Guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Part 11: pediatric basic life support. Circulation, 2005;112:IV–156, p. 13.