PREVENTION
The US National Center for Infectious Diseases received reports of three adult deaths due to chickenpox in the first three months of 1997, including two cases of pneumonia in previously healthy non-pregnant adults. Three control strategies were recommended, including universal vaccination against varicella in children aged over 12 months and non-immune adults, after antibody testing in doubtful cases. The vaccine was developed in Japan in 1972 and has been available in North America since March 1995. It is a live, attenuated virus preparation and therefore is unsuitable for immunosuppressed persons and pregnant women. Uptake of the vaccine has been poor even in designated US surveillance sites because of perceptions that chickenpox is mild and usually uncomplicated and unjustified concerns over the efficacy and duration of immunity afforded by vaccination. Other reasons advanced to account for poor "hit rates" are the stringent storage and handling regulations and matters of cost. Varicella is not included in currently available vaccination schedules in the UK.

The second strategy concerns varicella zoster immune globulin (VZIG). It is available for post-exposure prophylaxis in susceptible individuals including pregnant women and immunosuppressed persons and may be prescribed, on the advice of specialists in infectious disease, to non-immune health care workers who may present to the emergency department after occupational exposure to a case of chickenpox. VZIG should be given as soon as possible but may be effective up to 96 hours after exposure.

Finally, it was recommended that all adult cases of chickenpox should be treated with oral aciclovir, preferably within 24 hours of the development of the rash.


Management of laryngeal foreign bodies in children

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Abstract
Foreign body aspiration is one of the leading causes of accidental death in children. Food items are the most common items aspirated in infants and toddlers, whereas older children are more likely to aspirate non-food items. Laryngeal impaction of a foreign body is very rare as most aspirated foreign bodies pass through the laryngeal inlet and get lodged lower down in the airway. Two rare cases of foreign body aspiration with subglottic impaction in very young children (under 2 years of age) are described. In both the cases subglottic impaction occurred consequent to attempted removal of foreign body by blind finger sweeping. The clinical presentation, investigations, and management of these rare cases are discussed.

Keywords: foreign body; aspiration; larynx; children
Aspiration of a foreign body occurs either with objects that have been put into the mouth and accidentally displaced posteriorly or with objects that are unexpectedly encountered in food. In 1994, 3000 patients died from suffocation by ingested objects in the US making this the sixth leading cause of accidental death. As most aspired foreign bodies enter the bronchus after negotiating the glottis, the subglottic impaction of aspirated foreign body is rare. However, the diagnosis becomes a challenge when an object crosses the glottis and lodges in the subglottic region. Two cases of subglottic impaction of foreign bodies are discussed.

**Case reports**

**CASE 1**

A 1 year old boy choked after putting a small fish bone into his mouth. His mother, who witnessed the incident, tried to remove the fish bone by putting her finger into the child's mouth, but was unsuccessful. The child then had a bout of coughing with blood tinged sputum and developed stridor. The child was taken to a general practitioner for complaints of noisy breathing and vomiting and oral ampicillin was prescribed. Three days later the child was referred to the casualty department of our university hospital with the same complaints. On examination, the child was afebrile and had minimal inspiratory stridor but no cyanosis. He refused oral feeds and had pooling of saliva and milk in the oral cavity. He also had occasional vomiting. The respiratory rate was 22 breaths/min. There was no suprasternal or substernal recession. On auscultation there was equal air entry in both the lungs with a rough inspiratory sound which was maximally heard over the trachea, but there was no palpatory tracheal thud (the impact of a moving tracheal foreign body hitting against the wall of the trachea is felt by placing one finger on the trachea). A radiograph of the soft tissue of the neck showed a radio-opaque shadow in the subglottic region (fig 1). An emergency endoscopy was planned.

Under all essential monitoring (electrocardiography, non-invasive blood pressure, and pulse oximeter), anaesthesia was induced with oxygen, nitrous oxide, and halothane. All preparations were made to carry out tracheostomy or cricothyrotomy, if necessary. Once the child was under anaesthesia direct laryngoscopy was done. No foreign body was found despite a thorough direct laryngoscopic examination, therefore rigid bronchoscopy (using a 3.5 mm Storz bronchoscope) was used. Atropine 0.1 mg and suxamethonium 10 mg were given to facilitate introduction of the bronchoscope.

Ventilation was maintained by low frequency manual jet ventilation (Sander's jet injector). Adequate depth of anaesthesia was maintained with entrainment of oxygen-halothane mixture delivered through the breathing circuit (modified Ayer's T piece) connected to the ventilation port of the bronchoscope. Muscle relaxation was maintained with atracurium. The sagittally impacted foreign body was revealed only when the bronchoscope was gently withdrawn and the left vocal cord was retracted extremely laterally with the tip of the bronchoscope. The foreign body appeared like a "torn vocal cord" on end-on view through the bronchoscope. The fish bone, which was deeply embedded in the subglottic region, was removed with difficulty using forceps (fig 2). Check bronchoscopy showed oedema of the subglottic region. The child was subsequently extubated and transferred to the intensive care unit for observation. Postoperatively the child was treated with intravenous ampicillin and dexamethasone. Recovery was uneventful and the child was discharged from the ward after three days. At follow up two weeks later, he was asymptomatic and well.

**CASE 2**

A 14 month old girl was brought to the casualty department; she had been playing with plastic toys, was knocked down by her sister, and had then choked. The mother, who witnessed the incident, suspected foreign body aspiration and explored the baby's mouth with a finger. She felt a sharp foreign body but was unable to remove it. This manipulation resulted in blood stained vomiting followed by stridor. On examination the child had mild inspiratory and expiratory stridor but no

**Figure 1** Soft tissue radiograph of chest and the neck showing radio-opaque shadow of the fish bone at subglottic region in case 1.

**Figure 2** Subglottic foreign bodies: fish bone (case 1) and broken tip of plastic ball pen (case 2).
cyanosis. The respiratory rate was 30 breaths/min. Auscultation of the chest showed bilateral conducted sounds. The child was taking food orally. Radiography of the chest and soft tissue neck were normal. Under general anaesthesia (low frequency manual jet ventilation through a small catheter placed in the trachea) direct laryngoscopy did not show a foreign body. A rigid bronchoscopy (using 3.5 mm bronchoscope) revealed a greenish foreign body (a plastic tip of a ball pen) lying impacted at subglottic region; this was removed with forceps after dislodging and rotating it to the sagittal plane (fig 2). The anaesthetic technique used was the same as in the first case. A repeat bronchoscopy showed minimal subglottic oedema. Postoperatively the child was given ampicillin and dexamethasone and kept under observation. She was sent home in good health after two days.

Discussion

Most cases of foreign body aspiration occur in children less than 3 years of age.1-6 Children tend to put objects impulsively into their mouths and run the risk of aspiration. Most aspirated foreign bodies cross the larynx and get lodged in the trachea or bronchus with an occasional one remaining in the larynx. The reported incidence of laryngeal lodgement of aspirated foreign body varies from 2% to 11%.2-4 Two kinds of foreign bodies may lodge in the larynx. One is a large object like a piece of meat that may cause life threatening supraglottic or glottic obstruction. This type of accident is more common in adults than in children and is not a diagnostic dilemma as it causes complete laryngeal obstruction and sudden death. The National Safety Council in the US has documented more than 240 deaths in children due to foreign body aspiration.1 Nearly half (44%) of the cases of fatal choking in childhood are due to aspiration of various types of food (hot dogs 17%, candy 10%, nuts 9%, and grapes 8%).5 The other kinds of laryngeal foreign bodies are sharp and thin objects. Such objects can get embedded easily either at the laryngeal inlet, usually getting lodged between the vocal cords in the sagittal plane and causing non-fatal partial obstruction of the airways,6,7 or they can get embedded in the subglottic region.1

The initial response to aspiration is choking and coughing followed by stridor, sternal recession, coughing and hoarseness.10 The majority of aspirated foreign bodies caught in the airways of children are spontaneously eliminated by coughing and at times laryngospasm may cause a brief period of cyanosis and transient choking. Laryngeal foreign bodies with sharp edges cause not only dyspnoea but also odynophagia.10

After passing the laryngeal inlet an aspirated foreign body tends to be pushed upwards by the protective cough reflex; sharp and flat objects can get impacted in the subglottic region, which is narrow and conical in shape.10 In neonates the larynx lies higher up at the level of lower border of vertebral body of C4 and does not reach the adult position of C5-6 until the age of 4 years.14 In our patients parents instinctively attempted removal by blind finger sweeping, which probably pushed the thin and sharp foreign body deep into the subglottic region. Therefore, blind finger sweeping should never be done in infants and small children as this manoeuvre can cause trauma and induce bleeding and what is initially a partial airway obstruction may then become complete.9 Finger sweeping is rarely useful in adult choking victims to remove foreign bodies lying in the oral cavity or oropharynx before starting resuscitation. Instead, a properly performed Heimlich manoeuvre (with a combination of abdominal thrusts and back blows to relieve complete airway obstruction by a foreign body) is a much safer first aid procedure in young non-breathing, unconscious victims of choking.9 This manoeuvre appears to be responsible for many successful rescues resulting in a marked decline in paediatric deaths from foreign body aspiration in the US.1

Several series have discussed non-lethal laryngeal obstruction7,11-15 but none have specially addressed subglottic foreign bodies. Recently Halvorson et al reported that subglottic foreign bodies pose a diagnostic challenge and in the majority of cases there is a delay in diagnosis.15 Therefore, a high index of suspicion and specific questioning by the emergency department physician should aid in differentiating patients with a laryngeal foreign body from acute epiglottitis, laryngotracheobronchitis, and asthma. Radiography of the soft tissue neck and chest may not show any abnormalities as only 10%–15% of aspirated foreign bodies are visualised radiologically.16 In late presentations the local response to the foreign object is seen as a narrowing of the subglottic region on radiography, which is definitive or suggestive of foreign bodies.

The removal of a laryngeal foreign body under general anaesthesia is a potentially difficult and hazardous operation especially in the case of infants and young children.13-17 A detailed preoperative assessment is essential since the anaesthesia, like the operative technique, is determined by the site of the foreign body and any secondary complications. It requires a team effort, which involves a skilled and experienced endoscopist and an equally skilled and experienced anaesthetist and a scrub nurse. Close cooperation between the otolaryngologist and anaesthetist is essential to maintain the airway at all times. The cotwin tested method of removal of a foreign body in a spontaneously breathing patient is through a rigid bronchoscope.2,18 Muscle relaxation is usually advisable because the consequences of a patient bucking violently during airway instrumentation, especially with a rigid bronchoscope, are severe, for example unnecessary bleeding and airway rupture.19 In smaller children a useful technique is to use the tip of a rigid bronchoscope to retract the vocal cords. Thereby, a deeply embedded, subglottic, foreign body is easily spotted. Complications after bronchoscopy are uncommon, but laryngospasm and laryngeal oedema have been observed. Laryngospasm may be prevented by
Painful elbow and von Willebrand's disease

An acutely painful elbow as a first presentation of von Willebrand’s disease

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Abstract

A 26 year old woman presented to the accident and emergency department with a painful right elbow. There had been no history of trauma. Clinical examination suggested an effusion, which was confirmed on radiological examination. Her elbow was aspirated and revealed a haemarthrosis. Subsequent investigations revealed a diagnosis of von Willebrand’s disease (vWD). A spontaneously occurring effusion of the elbow may be due to a haemarthrosis. Aspiration of blood in the absence of trauma may lead to a diagnosis of an occult coagulopathy in addition to relieving pain. The diagnosis and treatment of vWD is discussed. (J Accid Emerg Med 1999;16:153–154)

Keywords: von Willebrand’s disease; haemarthrosis; elbow

Case report

A 26 year old woman, normally fit and well, presented to the accident and emergency (A&E) department with a painful right elbow. Symptoms had developed spontaneously over-night and she attributed them to sleeping in an awkward position. Her elbow was held in a flexed position. Flexion and extension were both restricted. Radiographs were taken which showed prominent anterior and posterior fat pads (fig 1). A synovial effusion was suspected and her elbow was aspirated to provide symptomatic relief. Surprisingly, aspiration of the joint produced 7 ml of blood. She was given a broad arm sling to rest her elbow. One week later her elbow was much improved and full extension was only limited by 10 degrees. At six weeks her elbow was back to normal.

On further questioning the patient gave a history of occasional bruising and heavy periods during the previous 2–3 years. She was on no medication. Her mother also had a history of bruising. In view of this history and the findings of a spontaneous haemarthrosis, she was referred for a haematological assessment.

Investigations revealed a normal full blood count, liver function, biochemistry, international normalised ratio, and activated partial thromboplastin time ratio. However von Willebrand factor (vWF) antigen and vWF activity were low, 31 IU/100 ml (50–200) and 29


Accepted 7 August 1998

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doi: 10.1136/emj.16.2.150

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