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Unusual cause of subglottic stenosis in an adult

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Abstract
Subglottic foreign bodies presenting, as chronic subglottic stenosis is extremely rare in adults. A high index of suspicion and a careful history is of paramount importance in the diagnosis of a subglottic foreign body. Laser should not be used to excise granulation tissue to expose the foreign body because of the danger and potential of a fire particularly when the nature of the foreign body is not known. Rigid bronchoscopes are more beneficial than flexible ones in the removal of foreign bodies especially in long-standing cases.

Key words: Foreign bodies; Laryngeal stenosis; Laser surgery

Introduction

Subglottic foreign body impaction presenting as subglottic stenosis is not uncommon in young children with a history of aspiration.[1] In adults however this form of presentation is extremely rare.[2]

In the following section we report a rare case of a foreign body impacted in the subglottis presenting with features of subglottic stenosis, over a period of eight years. The symptoms regressed completely after the removal of the foreign body – a sharp denture plate.

Case Report

A 48-year-old male was referred from a peripheral hospital for surgical management of subglottic stenosis. Past history included a history of a road traffic accident eight years ago. He sustained multiple injuries, including an undisplaced fracture involving the anterior commissure of the larynx and the cricoid cartilage. He was intubated and admitted to the intensive care unit, where he made an uneventful recovery. The patient subsequently presented with mild hoarseness and increasing stridor on exertion, that gradually worsened. He was investigated further with microlaryngoscopy and bronchoscopy, was diagnosed to have subglottic stenosis secondary to previous injuries and was referred to our airway clinic.

The clinical examination revealed a patient breathing comfortably with no evidence of stridor at rest. Biphasic stridor however was evident on mild exertion but was not associated with either intercostal/subcostal recession or use of accessory muscles of respiration. Further clinical examination was compromised because the patient was unable to tolerate indirect laryngoscopy or even the fibre-optic laryngeal examination. In view of the original diagnosis of subglottic stenosis the patient was listed for endoscopy.

Airway assessment was carried out using telescopes and the technique of nasopharyngeal controlled airway with spontaneous ventilation. This technique involves the use of intravenous propofol infusion, that is carefully titrated by the anaesthetist to keep the patient at a level of anaesthesia, that would be suitable for examination. The patient continues to breathe spontaneously and receives oxygen via a nasopharyngeal tube airway. Using this technique it was possible to obtain an uninterrupted panoramic view of the airway in the absence of an endotracheal tube. Examination revealed evidence of subglottic narrowing due to a ledge of distorted cricoid covered by granulations. The subglottic airway was reduced by approximately 40 per cent.

KTP laser was used to excise the granulations. During the procedure a flare was noticed followed by the smell of burning plastic. Use of laser was discontinued immediately and the patient was intubated. Further examination revealed no evidence of burns to the airway mucosa. A sharp edge of a foreign body was then noticed which was grasped with forceps and carefully retrieved. It was found to be an acrylic denture plate (Figure 1). The patient made an uneventful recovery post-operatively and remains asymptomatic.

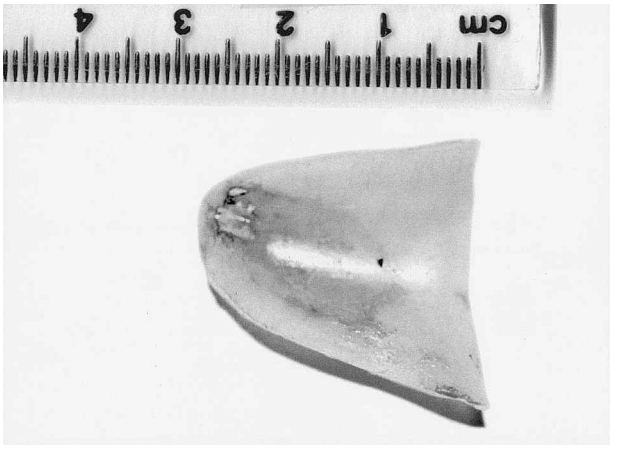

Fig. 1
Denture fragment found in the subglottic region measuring 2 × 2.5 cm.

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Discussion

Foreign body aspiration occurs predominantly in children between the ages of one to four years[1] whereas in adults only isolated cases are found in the literature. Subglottic foreign bodies in adults are extremely rare and the incidence is not known.

Factors that predispose to foreign body aspiration into the tracheobronchial tree in adults include primary neurological disorders, dental procedures, medical procedures, trauma and loss of consciousness, alcohol intoxication and the use of sedatives.[3]

Diagnosis of large obstructive aspirated foreign body is obvious. Smaller foreign bodies that travel past the glottis into the tracheobronchial tree may pose a diagnostic dilemma. Such an object may either lodge firmly in the bronchial tree or may be propelled up the trachea by the cough reflex it initiates.[4] A sharp foreign body in these circumstances is likely to be wedged under the under surface of the vocal folds and remain in situ. The initial symptom of cough is followed by suppression of the protective cough reflex due to gradual adaptation of airway receptors. This leads to a decrease and disappearance of symptoms and the event is forgotten.[4] Continued mucosal reaction around the foreign body and growth of granulation tissue, and inflammatory polyps result in gradual narrowing of the airway diameter. This may present as progressive stridor especially associated with upper respiratory tract infections and alteration in voice. These patients often pose a diagnostic dilemma. The diagnosis of foreign body aspiration can be difficult, as the symptoms often mimic other causes of airway obstruction.[3]

The time between the aspiration and onset of symptoms to diagnosis varies from days to years.[5] The most important diagnostic factor in the discovery of a subglottic or tracheobronchial foreign body is a high index of suspicion. Unlike in children, a foreign body is rarely considered in adults as the cause of sub-acute or chronic respiratory symptoms unless a clear history of aspiration is obtained. The diagnosis may be confirmed by visualizing the foreign body either on plain X-rays of chest and neck, or direct visualization using telescopes. In selected cases computed tomography (CT) or bronchography may be beneficial.

The objects that lodge in the subglottis are characteristically flat, thin, with sharp edges and easily become embedded.[4] They range from shawl, safety or straight pins[6] to pieces of drinking straw and sand.[7] Extraction of the impacted foreign body may require resection of the granulation tissue to expose the foreign body. This can be done either by laser or piecemeal using forceps. Great care should be taken when laser is used as many foreign bodies may contain potentially ignitable material as in our case.

The rigid bronchoscope offers a distinct advantage over the flexible one[3] as flexible instruments can be used only to pull, the rigid instruments enable pulling as well as rotation and, if necessary, pushing. These latter features are of particular importance in cases of sharp foreign bodies which, may have to be manipulated to minimize mucosal trauma.[8]

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