Case report

A White Board Needle in the Trachea

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Abstract

Foreign body aspiration often occurs amongst extreme age. Most of aspirated object are; nuts, nails, pins, coins, metal piece and dental appliances. Foreign body aspiration can be life threatening. Patients with foreign body aspiration may present with choking, coughing, wheezing, haemoptysis, asphyxia and even death. The symptoms and severity depend on the site of obstruction. This is a case of 9 year old boy provided the history of aspiration of white board needle. He had persistent cough but examination revealed normal vital signs. Radiological examination confirmed needle like radio opaque material in his trachea. This case report depicts the management and bronchoscope as diagnostic procedure of this case and role of X-ray and CT scan in dealing with foreign body in the tracheobronchial tree.

Keywords: Foreign body throat, bronchoscopy, white board needle.

Introduction

Impaction of foreign body in the respiratory foreign body is an otorhinolaryngology (ORL) emergency. It is often a potentially lethal situation therefore demand timely recognition and decisive action. There are trends to perform bronchoscopy with a view to remove impacted foreign body. Mortality of 1-2% was reported during and after bronchoscope extraction of tracheabronchiol foreign body[1]. However, a recent study demonstrated the mortality about 0.013% of bronchoscopy[2]. The symptoms of foreign body aspiration depends on the size and type of foreign body inhaled, patient age and interval time between aspiration and time of presentation. Relatively larger foreign body can cause total or partial airway obstruction. Foreign body aspiration in children causes more acute symptoms but adult patients can be asymptomatic. Therefore, clinically well children with positive history of foreign body should not negate bronchoscopy. Bronchoscope is a diagnostic and therapeutic procedure. This procedure amongst children is more difficult compared to adults. Anatomy of the larynx and consequences after aspiration of foreign body which may cause oedema of larynx can make bronchoscopy a difficult procedure. Skill anaesthetists, available equipment and experience surgeon counts on the successful management of tracheobronchial foreign body. Radiological investigation is a good tool to diagnose foreign body. An X-ray is helpful to see the presence of foreign body but CT scan may further help in assessing the exact anatomical site and present of local complications.

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Case Report

A 9 year old boy was referred to otorhinolaryngology clinic for foreign body throat. On presentation, patient claims swallowed a white board needle while playing. The boy complained of mild pain, however, was coughing persistently. Physical examination was done and vital signs were within normal limit. The X-ray anteroposterior view (AP view) of neck revealed a shadow, possibly of a foreign body at the level of T1 but lateral view was completely conmal (Figure 1 and 2). X-ray AP view demonstrated completely normal lung filed. We proceeded with computed tomography scan of the neck and chest. Ct scan confirmed the position of foreign body at the level of T1 (Figure 3 and 4). Later, bronchoscopy was performed and the foreign body was removed found it to be a white board needle (Figure 5). The needle was lying horizontally over the trachea. Six hours after the procedure the patient tolerated liquid and subsequently solid food. Patient was discharged on the following day with oral antibiotic and mild analgesic. He was reviewed one week after found to be completely alright. .

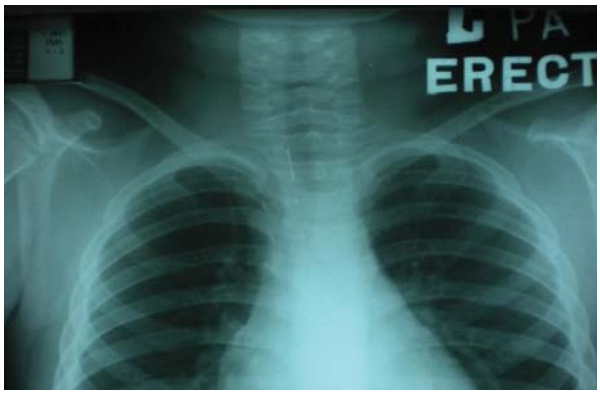

Figure 1: Anteroposterior view of chest X-ray noted foreign body at the level of T1.

Figure 2: Lateral view of chest X-ray.

Figure 3: The CT scan image confirm the presence of the foreign body in the trachea at level of T1

Figure 4: CT scan image confirm the presence of the foreign body in the trachea

Figure 5: Foreign body removed from trachea measuring about 2cm

Discussion

Removal of tracheabronchiol foreign body needs skilled endoscopist and anaesthetist. The demand to remove the foreign body impacted in the airway and the degree of difficulty of the procedure depends on the surgeon skills, patient's factors like age, type and size of foreign body inhaled the interval between aspiration and removal of foreign body, skill of anaesthetists and availability of appropriate equipment.

In the past few decades, some surgeons preferred tracheostomy over the bronchoscopic procedure as children are susceptible to have upper airway obstruction due to the anatomy of the larynx. Tracheostomy is believed to protect the airway and help assist the bronchoscopy and removal of foreign body. However, it was later suggested that tracheostomy should only be offered to patients with severe respiratory distress with imaging evidence of tracheobronchial foreign body[3]. Presently the tracheostomy is not performed and at the same time tremendous progress have developed in the filed of anaesthesia and endoscopic procedure. Jackson (Ref) invented a modern of method endoscopy of the upper airway and esophagus, using hollow tube with illumination. He has shown 98% success rate of bronchoscopic removal of tracheobronchial foreign body under local anaesthesia. The study also showed significant risk reduction in bronchoscopic removal of foreign body over tracheostomy. Over the time bronchoscopy technique is being improved. Today, the use of ventilating bronchoscope with advances of anaesthesia has further reduced the mortality of foreign body removal in the respiratory tract.

Foreign body aspiration is more common in children. The common types of foreign body involved for children are portion of nuts, popcorn, fruit seed, plastic and metal material. Children are more prone to inhale foreign body as the fact that their habits of putting objects into their mouths. Adult with foreign body aspiration usually aspirate their own dentures or food during swallowing. Debeljak in his review of bronchoscopic removal of foreign body in adults showed that bone is the commonest foreign body found[4].

Patients with foreign body aspiration may have symptoms like choking, paroxysmal coughing and wheezing, coughing, haemoptysis, asphyxia and even death. The symptoms depend on the size and type of foreign body inhaled, patient age and interval time between aspiration and presentation. A prospective study demonstrated that in case of foreign body inhalation 92% of patients present with cough, followed by breathlessness (80%)[5]. Foreign body can cause total or partial airway obstruction which can lead to severe respiratory distress. Foreign body aspiration in children causes more acute symptoms but adult patients can be asymptomatic. There was an interesting report which revealed that an adult aspirated steak knife **strade** and remained asymptomatic 2 months and then presented with haemoptysis[6]. It was suggested that adults may tolerate aspiration of foreign body for certain time without acute life-threatening consequences. However, in children, the symptoms are more acute because they are prone for lungs complications. The national safety council of America; 1980 showed that the commonest cause of accidental death at home for children under 6 years old is inhalation of foreign body. They die because of asphyxia. Normally the right bronchus is wider, shorter and more vertical, making a relatively straight path from larynx to bronchus compared to the left bronchus. Therefore, inhaled foreign body is more susceptible to get lodged in the right bronchus. This was supported in a study which showed that 42 from 63 tracheobronchial foreign bodies lodged in the right bronchus[4]. Irritation to surrounding tracheobronchial tree can cause cough, leading to production of mucus plug which can cause respiratory distress. Our patient which aspirated a sharp end white board needle caused him persistent coughing. However he never had hemoptysis.

Standard X-ray, anteroposterior and lateral view, is sufficient to detect tracheobronchial foreign body[7]. However, CT scan is the gold standard as it is more specific and sensitive. Bhalodiya et al[8] opined that in evaluating suspected foreign body in tracheobronchial tree radiological procedure has little value. In their study 32 out of 42 cases X-ray finding was normal but bronchoscopy confirmed the presence of foreign body[8]. Similar scenario was also demonstrated by others[5].

In our patient, both anteroposterior and lateral chest X-ray was done and the foreign body was noted in anteroposterior view at the level of T1 but not in lateral view. To confirm presence of the foreign body

and precisely localize it we proceeded with CT scan. In the present case X-ray failed to confirm the presence of the foreign body. It may be argued that sternum obscured the position of impaction. CT scan rather confirmed the presence and site of impaction.

Previously Satter et al[9] ruled out X-ray as tool in the diagnosis of location of tracheobronchial foreign body since often the finding is non-specific and/ normal. CT scan, however, is useful in many ways which delineates complications like obstructive emphysema, obstructive pneumonia and obstructive atelectasis. It also guides surgeon to take precaution about possible complication(s) while performing bronchoscopy. As the boy in this case inhaled a sharp white board needle which can cause irritation or even worse case penetration of the tracheabronchiol tree, hence, it was important to know about the orientation of the needle to avert the unwarranted injury during bronchoscopic removal.

Bronchoscopy is believed to be the best diagnostic and therapeutic procedure for tracheobronchial foreign body. The procedure should always be done with precaution to ensure adequate ventilation deliver to patient. Ventilation will be more difficult in cases of deeply seated foreign body in the bronchus. Therefore, ventilating bronchoscopy needs a skilled anaesthetist to be on standby.

In conclusion, a case of tracheabronchiol foreign body should always be given top priority with prompt action. The case with a history of witnessed aspiration is the single best predictor for tracheabronchiol foreign body. The normal X-ray finding and physical examination with suspicious history shouldn't negate the decision for bronchoscopy. Bronchoscopy is a diagnostic and therapeutic procedure and it remains the gold standard management for tracheabronchiol foreign body. CT scan is the best tool to diagnose foreign body and may help delineate local tissue damage.

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