

Foreign Body Bronchus Removed by Tracheotomy

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Abstract

A 3 year old male child, with 13 kg body weight, referred from a peripheral hospital with suspected foreign body (FB) bronchus. Chest radiograph from that hospital showed absent airo-gram below right bronchus and hyper-inflated left lung, but foreign body could not be seen. Rigid bronchoscopy was performed in emergency theatre under general anaesthesia, with resistance in passing the scope through the glottis. The foreign body was difficult to remove after multiple attempts and finally it was removed by the tracheotomy as a life-saving procedure followed by tracheostomy. This patient required an unplanned ICU admission for one day and later shifted to high dependency and then to the ward and he is doing well.

Keywords: Airway Foreign Bodies; Bronchoscopy; Tracheotomy; Tracheostomy; Unplanned ICU Admission.

Introduction

There are many defence mechanisms of human body but in spite of it is difficult to protect airway of foreign material. Cough reflex is one of them, none of these mechanisms is perfect, and foreign bodies frequently enter in the airways of our paediatric patients [1].

There are multiple reasons for that; for example, absence of molar teeth in children which make them difficult to chew food, tendency to talk, laugh, and activities while eating also increases the incidence. Foreign body aspirations are more common in younger than 3 years because of high respiratory rate and less chewing.

This kind of cases needs immediate diagnosis and management to avoid life threatening complications. Poor history and inability of FB detection radiology make the situation worst [2]. FB aspiration/inhalation is still a cause of death in childhood, usually in pre-school children.

It is noted that when it is difficult to pass the bronchoscope through glottic space and flexible bronchoscopy as we know is rarely effective for removal of foreign bodies, leading eventually to surgical removal; for example, tracheotomy, thoracotomy [3].

Case Report

Three year old male child, came to our hospital with history of suspected foreign body aspiration of a ball pen part, some hours before. The patient had been transferred from the peripheral hospital due to unavailability of physician performing bronchoscopy. On examination in accident and emergency, patient was tachypnoeic and tachycardic with respiratory rate of 40-50/min and pulse rate of 160-180/min. and maintaining oxygen saturation of 99% even on room air. Air entry on right side is minimal and left side there is good air entry. He had two episodes of vomiting with cough

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and discharge of small amount of mucoid secretion. Chest X-ray in PA view from peripheral centre showed absence of airo-gram below right bronchus and hyperinflated left hemithorax but there were no signs of associated atelectasia.

The decision is taken for immediate rigid bronchoscopy under general anaesthesia. Induction of anaesthesia was done as per standard protocol and cisatracurim was given to paralyse him and maintained on sevoflurane and it was uneventful. Rigid bronchoscope was inserted by the most experienced paediatric surgeon who regularly do such kind of cases. There was a difficulty in inserting the scope at the vocal cord level and the same experienced by surgeon in subsequent attempts too. Surgeon could see the foreign body as blue plastic bottom cap of a ball pen in right bronchus. He tried to hold and remove this cap with the forcep couple of times but couldn't be succeeded and then he decided to change the forcep. Patient was maintaining saturation during all this time.

Despite of using 3-4 types of forceps he couldn't be able to retrieve the foreign body above the vocal cords and it slips below subglottic area and due to

ventilation it slowly move toward right bronchus each time after removal of scope. Patient was saturating well and hemodynamically stable but once the foreign body goes to right bronchus, chest rise decreases significantly on that side.

Finally, it was decided to do tracheotomy as an emergency lifesaving procedure to remove the foreign body. Once again surgeon did rigid bronchoscopy and caught hold the FB and retrieved it till subglottic area and then another surgeon hold the scope in that position and the main surgeon move to do the tracheotomy.

Surgeon did tracheotomy and remove the FB followed by tracheostomy. It was decided to shift the patient to the paediatric intensive care unit (PICU) for further management, and it was going to be an unplanned in hospital patient's ICU admission. The patient was ventilated in operation theatre for 2 hours post procedure as there was no bed available in PICU and has been allowed to breathe spontaneously and weaned off ventilator and shifted to PICU during late night hours with oxygen by T-piece and tracheostomy.

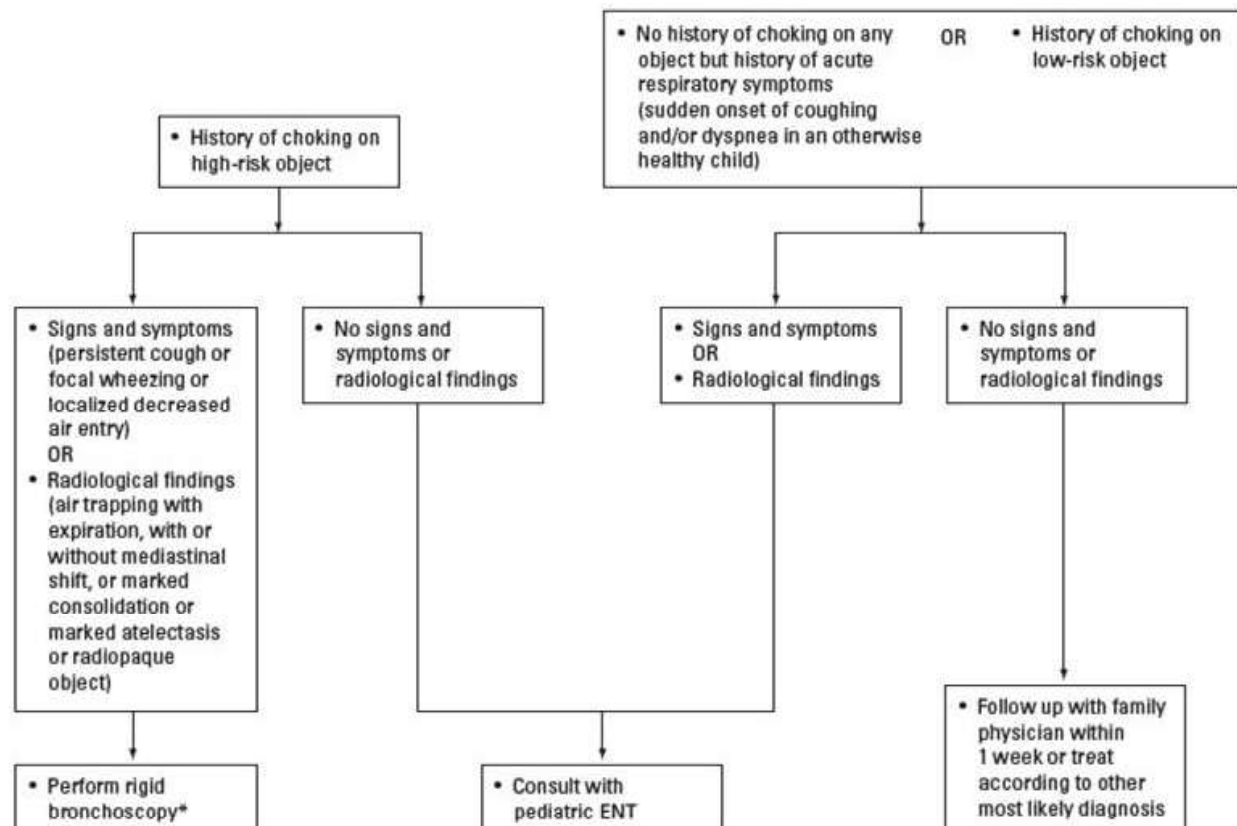




Fig. 2: Foreign body showing signs of multiple attempts of holding it by forceps



Fig. 3: Foreign body showing signs of multiple attempts of holding it by forceps

Discussion

Paediatric patient with foreign material inhalation might show some respiratory discomfort immediately. After these initial symptoms, patient may be asymptomatic, and this is the time when clinician might think that FB might be expelled by the cough or swallowed. Because of this reason physician should always be alert in such kind of cases.

It is highly recommended to manage such kind of cases at tertiary care hospital with a full backup of paediatric bronchoscopy and anaesthetic equipment and expertise [4]. If we refer to the figure 1 it is clearly mentioned that rigid bronchoscopy is the procedure of choice for the diagnosis and management of FB inhalation in paediatric patient. Peri-operative complications are not correlated with either the choice of agent (volatile or intravenous) or the duration of surgery. A team work and experience paediatric endoscopist can change the scenario from unsafe to safe [5]. Bronchoscopy is a

relatively simple procedure in most cases, and we should emphasize the need of appropriate training practice and the right material (rigid bronchoscope of different sizes and clamps for bronchial foreign bodies). The complications include pneumonia, pneumo-mediastinum, pneumothorax, mediastinitis, respiratory failure and death [6]. Flexible bronchoscope is rarely efficient to remove foreign bodies, but an attempt should always be made before the surgical procedure which may avoid opening of airway and unplanned critical care admissions.

However, in rare cases, certain materials cannot be removed by traditional endoscopy, and must be removed through an opening in the airway. Marks et al [7], studied 6,393 patients with FBs in the airway showed that when open surgery is indicated for the removal of the FB, thoracotomy (2.5%) is more common than tracheostomy (2%). Of the 104 patients who required tracheostomy, 52 were because of laryngeal edema after bronchoscopy, 12 as a route for the introduction of a bronchoscope, 11 in order to permit assisted ventilation, and only 10 to enable the removal of large objects which would not pass the subglottic region [7]. In 19 patients the indications for tracheostomy were not commented upon [7]. In another study by Fidkowski et al. in 2010 studied nearly 13,000 FB aspiration cases in paediatric and the tracheotomy required only in 7 (0.05%) cases [8].

As we know the subglottic region is the narrowest part of the paediatric airway, any instrumentation can reduce the diameter even further and make it impossible for the FB to come out, and therefore every one dealing with such scenario should have basic knowledge of tracheotomy.

In another study, with the aim of starting a systematic analysis of FB injuries in children living in European Countries, the European Survey on Foreign Bodies Injuries (ESFBI) [10] has studied the phenomenon from a common point of view and conclusions was that 8.8% of this required surgery to remove foreign body.

Conclusion

Some of the paediatric airway FB cannot be removed by bronchoscopy alone, even if performed by an experienced surgeon. Removal of foreign body through tracheotomy is a rare event, and is indicated for patients who have aspirated particularly wide FBs, which could not pass the subglottic region, or FBs which stuck at subglottic

level and cause acute respiratory obstruction. In this situation patient may require unplanned admission in intensive care or high dependency.

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