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Recommended Citation

Khan, S. H., Mian, A., Khan, Q. M., Khan, N. (1997). Special maneuver for removal of an impacted bronchial foreign body at thoracotomy. *Journal of the College of Physicians and Surgeons--Pakistan : JCPSP*, 7(3), 133-135.

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SPECIAL MANEUVER FOR REMOVAL OF AN IMPACTED BRONCHIAL FOREIGN BODY AT THORACOTOMY

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ABSTRACT: Tracheobronchial foreign body aspiration is a common, but often unobserved event in children. A delay in diagnosis can lead to difficulty in removal of the aspirated object. The present case report highlights a special intraoperative maneuver at thoracotomy that was adopted to remove an impacted foreign body that could not be removed at bronchoscopy.

KEY WORDS: Foreign bodies Thoracotomy Bronchiectasis

INTRODUCTION

Aspirated objects in the airway of children still remains a significant cause of morbidity and mortality^{1,3}. Diagnosis can be made on the basis of a history of foreign body aspiration, radiographic signs, and confirmed on bronchoscopy^{2,3}. With the development of modern endoscopic techniques and controlled anaesthesia, most foreign bodies can be removed safely with a bronchoscope^{1,4}. Open surgery for removal of a foreign body and an irreversibly damaged lung (bronchiectasis, lung abscess, etc.) is rarely needed¹. In the past 4 years, only in 2 cases, including the present case report, thoracotomy had to be undertaken for removal of foreign body.

CASE REPORT

A six year old boy was admitted with a week long history of high grade fever, dyspnea and cough with purulent sputum. On further inquiry, it was revealed that these symptoms had been present intermittently over the past seven months. There was no definite history of foreign body aspiration or contact with any tuberculous case. Investigations done elsewhere included an ESR of 40, and several chest radiographs, all of which showed a localized opacity in the lower lobe of the right lung. The child had initially received treatment for pneumonia, but around five months prior to presentation, anti-tuberculous therapy was also started. On examination, the child was anaemic, febrile and tachypnoic. Breath sounds were diminished in the right lower zone of chest. A chest radiograph revealed a rectangular radiodense shadow in the right lower segment with collapse of affected lobe (Fig. 1). Previous radiographs taken elsewhere had a similar shadow as mentioned above that went unnoticed. Patient was put on intravenous antibiotics and chest physiotherapy was started. Two days later bronchoscopy under fluoroscopic control was performed. The foreign body appeared to be a cup-shaped object that could not be negotiated proximally. In addition,

cavitation had developed which permitted the object to be displaced distally. Because of the unsuccessful bronchoscopic attempt at removal of the foreign body, a thoracotomy had to be performed two days later. On opening the thoracic cavity, the medial basal segment of the right lung was found to be collapsed, with cavitation, and contained a large amount of pus; this segment was resected. On searching for the foreign body, which was impacted in more proximal bronchus we realized that localization of its exact position by palpation was difficult owing to the marked enlargement of the surrounding pulmonary hilar lymph nodes. In order to localize the object and subsequently remove it, we decided to complement the thoracotomy with intraoperative bronchoscopy. With the patient still in the left lateral position, and continued general anaesthesia, the endotracheal tube was replaced by a bronchoscope. Through this a foreign body extracting forcep was introduced, thus pushing the foreign body distally. In this manner localization at the hilum was made possible (Fig. 2). As the bronchus supplying medial basal segment was already closed while resecting that segment, a bronchotomy was made in lower tube bronchus and the object was extracted. Bronchotomy was closed with prolene. An under water seal drainage was placed and the thoracotomy incision

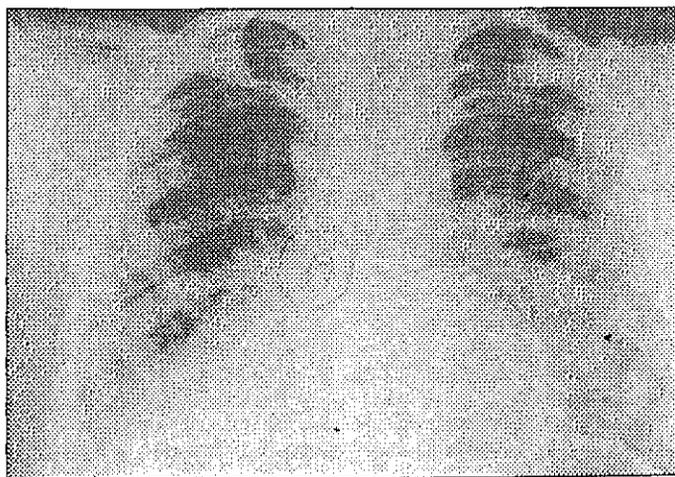


Figure 1 Chest radiograph (at admission) showing a radio-opaque foreign body in the right lower lobe segment and a collapsed and fibrosed lower lobe.

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Received October 7, 1996; accepted May 14, 1997

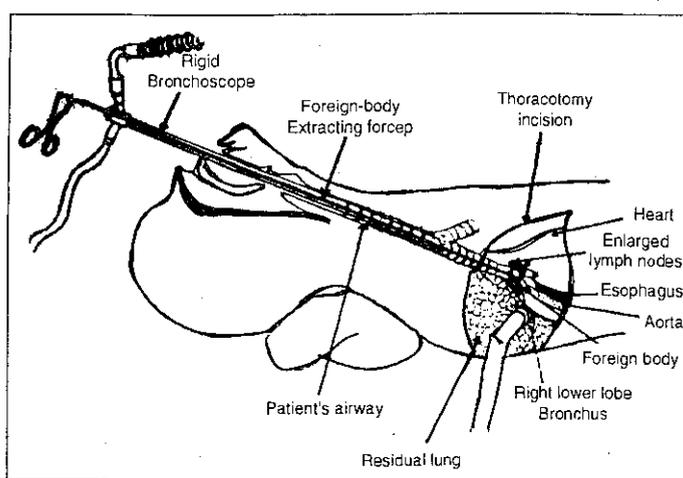


Figure 2 Diagrammatic showing the foreign-body extracting forcep being used to push the object distally.

closed. The foreign body was a cup shaped metallic object of unknown origin. Postoperative progress was satisfactory with rapid expansion of residual lung (Fig. 3). The patient was allowed to go home a week later.

DISCUSSION

Foreign body aspiration is a common problem with 80% of all aspirations occurring in children^{2,5,7}. Most occur between the ages of six months and four years². It accounts for as many as 500 to 3000 deaths per year in the United States alone². While obstruction of the larger airways produce dramatic symptoms, that of the smaller airways often go unnoticed by parents, or the history may be omitted or forgotten⁸⁻¹⁰. This, coupled with low index of suspicion of medical personnel, leads to a delay in diagnosis resulting in complications. Aspirated objects tend to get lodged into the dependant bronchi where they trigger an inflammatory response. This produces a vicious cycle of obstruction and further inflammation culminating in atelectasis and subsequent pneumonia⁴, as seen in our patient. Reports exist of patients being treated for as long as twenty years for asthma when actually a foreign body was present¹¹.

Early diagnosis and prompt treatment is mandatory for the prevention of serious complications. Radiographic findings are nonspecific, except for presence of radio-opaque foreign body. Diagnostic bronchoscopy is therefore warranted in a child with a long history of paroxysms of coughing or recurrent pneumonia¹² but the facilities of bronchoscopy are available in only a few places in our country¹³.

The success rate for removal of foreign body by endoscopy has reached 95% to 99%, with the modern techniques of fluoroscopy and anaesthesia^{14,16}. An early diagnosis and fewer complications also ensure this. Thoracotomy for foreign body removal has been reported in 1% to 2% of patients by most authors^{7,12,17,18}, but one series reported a rate as high as 8%¹. In the special maneuver that we used, thoracotomy was combined with an intraoperative bronchoscopy. This technique helped in localizing a foreign body, which on thoracotomy alone was difficult to distinguish from the surrounding hilar structures. A thorough literature search did not reveal a similar approach.

The difficulties encountered during the procedure, and thoracotomies in general, highlight the need for early diag-



Figure 3 Post operative chest radiograph of the patient showing satisfactory lung expansion.

nosis of a possible foreign body aspiration. Education of parents, child-care providers and medical personnel can reduce the sequelae of a late diagnosis^{1,13}. Physicians should remain aware of the possibility of the presence of foreign body in children with indolent pulmonary symptoms despite adequate treatment, and especially not miss the radioopaque ones.

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