EVACUATION OF FOREIGN BODY IN LEFT MAIN BRONCHUS WITH FLEXIBLE OPTICAL BRONCHOSCOPY IN ASYMPTOMATIC NEEDLE ASPIRATION PATIENT

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Case Report

EVACUATION OF FOREIGN BODY IN LEFT MAIN BRONCHUS WITH FLEXIBLE OPTICAL BRONCHOSCOPY IN ASYMPTOMATIC NEEDLE ASPIRATION PATIENT: A CASE REPORT

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Abstract

Background: Foreign body aspiration is one of the most common respiratory and airway emergencies. The incidence is higher in children and obstruction occurrences are common. Serious late complications also can occur if abandoned. Bronchoscopy as a gold standard modality in diagnosing and treating this condition is widely available, and the emerging flexible optic bronchoscopy (FOB) is now more common.

Case: Ten-year-old girl with a history of needle aspiration came to ER with an asymptomatic condition. Further investigations reveal leucocytosis and a metal-needle-shaped foreign body found approximately in the left main bronchus via chest x-ray and CT scan. Bronchoscopy with FOB was done with general anaesthesia and LMA successfully evacuate the needle although the pin already infiltrating the mucosal wall.

Discussion: Asymptomatic foreign body aspiration is nearly at the same rate as symptomatic one. Management difficulties and complications increased the longer the foreign body infiltrated the respiratory tract. Early diagnosis with chest x-ray and CT scan is necessary. Prompt and urgent evacuation of the foreign body is needed. The use of FOB associated with a high success rate and low complications makes FOB emerge as a modality of choice in this case.

Conclusion: The symptom of the foreign body in the respiratory tract may be asymptomatic. Early and right diagnosis must be worked out as early management of asymptomatic foreign body aspiration. Early FOB can be used as a modality of choice in this case, preventing further damage to the respiratory tract.

Keywords: aspiration, bronchoscopy, foreign body evacuation

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INTRODUCTION

The respiratory tract foreign body is one of the most common respiratory and airway emergencies. The incidence is higher in children, and because of the direct or impending airway obstruction, the morbidity and mortality rates are high if not treated promptly.[1]

Therefore, early diagnosis of foreign body aspiration is important and following an early evacuation is urgently needed to prevent complications of foreign body aspiration in the respiratory tract.

BACKGROUND

The foreign body in respiratory tract can cause morbidity and mortality, especially among children. Previous retrospective studies show a mortality rate of 2,5% in patients with foreign body aspiration.[2] Even in cases without the direct acute effect of aspiration, late complications such as pneumonia, bronchiectasis, lung abscess and lung atelectasis can occur in case of undiagnosed or abandoned foreign body aspiration. It also can cause bronchial stenosis and obstructive emphysema. Retrospective studies also show that the risk is related to misdiagnosed cases and the risk increases as the longer foreign body infiltrate the respiratory tract.[2]

The most common signs and symptoms reported are cough. In a retrospective study includes 173 patients with foreign body aspiration who underwent bronchoscopy, cough symptoms were reported in 75,72%, dyspnoea in 11,56% wheezing in

6,26%, cyanosis in 2,31%, choking in 1,73%, stridor in1,16%, and recurrent lung infection in 1,16%.[3] In many cases of foreign body aspiration in paediatric patients, no signs or symptoms are reported. It counts nearly 50% of cases in the retrospective study. Plain x-ray used as early diagnostic tools in asymptomatic patients with suspected foreign body aspiration.[4]

The gold standard modality in diagnosing and treating foreign body aspiration is bronchoscopy. Flexible optic bronchoscopy (FOB) is the treatment of choice because of its non-invasive and non-traumatic nature. Recent studies show FOB are safe and effective in foreign body evacuation either in the proximal or distal respiratory tract.[5]

CASE ILLUSTRATION

A ten-year-old girl came to the emergency room with a history of needle aspiration 6 hours before admission. The patient was asymptomatic from the event. Physical examination shows no abnormalities. Laboratory tests showed leukocytosis (12.800/uL) and posterior-anterior chest x-ray showed a high-metal density foreign body in the left paravertebral in thoracal 6-7 level, approximately in the left main bronchus.
(Figure 1.)

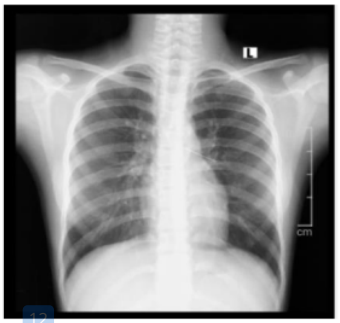


Figure 1. A foreign body was shown in chest x-ray

The patient then underwent a chest CT-Scan and which revealed a foreign body with metal density in needle shape in the left main bronchus (Figure 2).

Figure 2a. Chest CT Scan with contrast showed the needle foreign body in the left main bronchus in coronal view

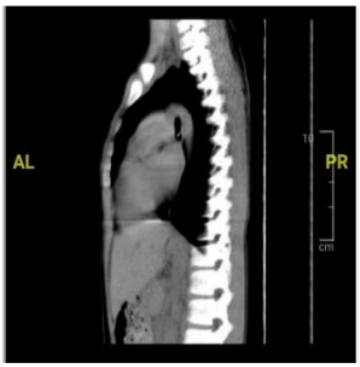


Figure 2b. Chest CT Scan with contrast in lateral view

Figure 2c. Chest CT Scan with contrast in axial view

The patient was then given an intravenous fluid with prophylaxis antibiotic and NSAID.

Then the patient was planned to undergo bronchoscopy with anaesthesia and thoracic surgery as a backup team. Before bronchoscopy, general

anaesthesia was done with a laryngeal mask airway (LMA) application. Bronchoscopy was done using Flexible Optical Bronchoscopy (FOB), with flexible forceps biopsy. Bronchoscope was introduced to the respiratory tract through the LMA lumen and the needle identified already infiltrated mucosal wall of the left main bronchus.
(Figure 3).

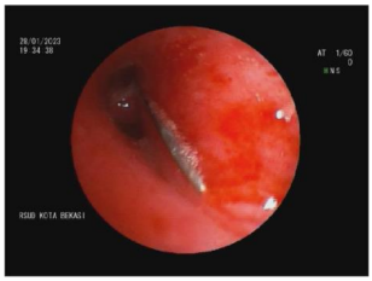


Figure 3. The foreign body was shown through the bronchoscope, infiltrating the mucosal wall

After being identified, the foreign body was extracted and evacuated with forceps (Figure 4). The foreign body was evacuated through the LMA lumen and evacuated out of the body together with the extubate of LMA.

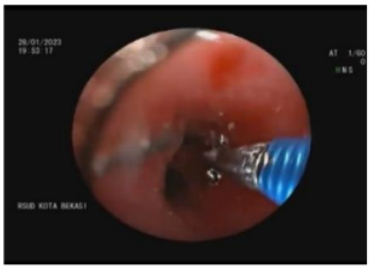
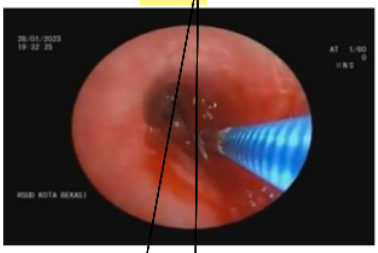


Figure 4. Forceps bronchoscopy was introduced to the left main bronchus.

Figure 5. A foreign body was extracted by forceps



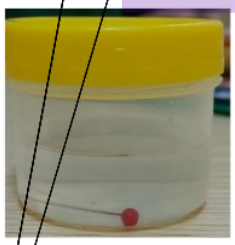


Figure 6. (a.) The foreign body was evacuated carefully with forceps. (b.) A needle was successfully evacuated

The procedure was done in 2 hours and the bleeding was minimal. The patient was stable after the procedure and evaluated in the ward. After 24 hours of stable evaluation, the patient was discharged.

DISCUSSION

Patients with foreign body aspiration can be asymptomatic as common as symptomatic ones. The most common sign and symptoms are cough, choking and dyspnoea. Although rare, a chest examination shows wheezing or asymmetrical breathing sounds.[6] According to a previous study, cough as the single complaint can be found in 61% of symptomatic patients, 19% complaining of cough and fever, and 16,5% with cough and wheezing. The rarest findings are chest pain and hemoptysis.[5]

Atelectasis, pneumothorax and air trapping also can be found in several cases of foreign body aspiration. Recent studies show most common radiological feature are consolidation or collapses

emphysema in 47,97% of patients, flattening diaphragm in 9,83%, atelectasis in 9,83%, pneumonia in 12,14% and normal findings in 20,23%.[3] In our patients the chest x-ray shows no findings other than the foreign body.[3]

Some cases with asymptomatic and normal chest X-rays need a prompt diagnosis with bronchoscopy as a gold standard, but a chest CT scan still can be a diagnostic choice in the majority of cases. Although early diagnosis with a plain chest x-ray is recommended, if normal findings in highly suspicious cases occur, chest CT scans and bronchoscopies need to be done.[7] A study by Vincent et al shows 86% of paediatric patients with foreign body findings in CT scan shows evidence of foreign body in bronchoscopy. This study also shows that a CT scan is a non-invasive and reliable modality compared to high-risk endoscopy as a diagnostic tool. The sensibility of CT scan is approximately as high as 98%.[8]

Although, early and rapid diagnostic and treatment with bronchoscopy in life-saving conditions are emergently needed. The use of rigid bronchoscopy (RB) is avoided nowadays, especially in paediatric patients due to its invasiveness and higher risk of serious complications than FOB. FOB is the most common method used to anatomically and functionally evaluate the respiratory tract for diagnostic and/or therapeutic purposes. The complications rate of FOB is significantly lower than RB, and the foreign body evacuation success rate is as high as 92%.[9] A study conducted by Ma et al shows that 42 out of 57 patients with foreign body aspiration (73,7%) are successfully treated with FOB. Bronchoscopy rigid was done successfully in 13 patients (22,8%) with failed FOB and the other 2 patients failed both had to undergo thoracotomy.[10]

Another study by Yuksel et al. shows FOB successfully extracted respiratory tract foreign bodies in 93% of subjects (29 out of 31 cases). The 2 other patients were unable to do because of the granulation tissue surrounding the foreign body due to the chronic history of the disease. The use of the catheter in FOB cases varies between subjects depending on the subjects' age and body weight. All subjects underwent general anaesthesia with NO_2 inhalation, propofol injection and neuromuscular blockers. Location distribution of the foreign body was in the right main bronchus in 23% of patients, lower right bronchus in 19% of patients, middle right lobes in 3% of patients, upper right lobes in 6% of patients, left main bronchus in 23% of patients, lower left bronchus in 12% of patients, upper left bronchus in 10% patients, and trachea in 3% patients. Another study also shows in paediatric patients range 2 months-old – 12 years old age shows that from 173 patients with bronchoscopy confirmed foreign bodies, the most common location was in the right main bronchus (64.74%), left main bronchus (25.43%) and 9.83% in carina.[5]

Paediatric patients have a narrower respiratory tract which leads to a high incidence of respiratory tract obstruction even in small-sized foreign body aspirations. Anatomical narrowing in tracheobronchial trees in children makes the proximal airway the most common obstruction location. Based on a retrospective study, 96% of foreign body found in this area. In under 15 age children, the left-sided location of the foreign body is more common than the right one because the more symmetrically main bronchus and the aorta development affect the trachea and left main bronchus.[11] The most common foreign body reported in a study are nuts (69%). The wide use of needle pins in our country made them one of the most common foreign bodies found in the respiratory tract.[5]

Postoperative complications are persistent cough, laryngospasm, bronchospasm, haemoptysis, and postoperative fever.[5] Another study shows mechanical ventilation is needed in 11,56% of patients and the mortality rate was 2,31% and 2,89% of patients who failed with bronchoscopy will need thoracotomy.[3]

CONCLUSION

Foreign body aspiration can asymptomatic. High suspicion must be made in patients with a clear history of foreign body aspiration. Early radiological evaluation with chest x-ray must be done immediately and a CT scan can be used further as a fast and

reliable diagnostic tool. Bronchoscopy as the gold standard treatment must be done as soon as the diagnosis is established. Early FOB with general anaesthesia can be a reliable tool with significantly lower complications in the evacuation of foreign bodies in the respiratory tract, preventing further damage to the respiratory tract.

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