



Development of Organized Pleural Empyema as a Result of Occult Foreign Body Aspiration

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Abstract

Foreign body (FB) aspiration is a rare incident in adults. Many patients cannot recall the episode of aspiration and are hospitalized with complications of an endobronchial FB.

We present a case with right-sided chronic pleural empyema, ineffectively treated in another hospital with chest drainage, uniportal VATS, and insertion of five chest drains as a result of occult foreign body aspiration. Endoscopic extirpation of a foreign body in the right lower lobar bronchus was performed. Right posterolateral thoracotomy, decortication, and pleurectomy were performed because of a trapped right lung.

Preoperative bronchoscopy is recommended in all patients with pleural empyema before surgery. When chest drainage and VATS are unsuccessful in expanding the lung in chronic empyema then thoracotomy, debridement, pleurectomy, and decortication are indicated.

Keywords

bronchoscopy, foreign bronchial body, surgery, pleural empyema, wrong treatment

INTRODUCTION

Foreign body (FB) aspiration is a rare incident in adults as it usually occurs in children. It is responsible for 0.16%–0.33% of performed adult bronchoscopic procedures.^[1] The history of foreign body aspiration varies across studies but is about 50% on average.^[2] Therefore, many patients cannot recall the episode of aspiration and are hospitalized with complications of the endobronchial FB. We present a case of organized pleural empyema as a result of occult foreign body aspiration.

CASE REPORT

A 57-year-old man was admitted to the Thoracic Surgery Department with a 2-month history of shortness of breath, right-sided chest pain, and fatigue. Two weeks after the onset of symptoms, he was hospitalized in another hospital where thoracocentesis and chest drainage were performed with evacuation of 1500 ml of pus. After no improvement for two weeks in the same hospital and an unexpanded right lung (**Fig. 1**), video-assisted thoracic surgery (VATS) and the insertion of five chest drains were performed. *Pasteurella multocida* was isolated from the microbiological examination. Subsequent chest X-rays showed that the lung was not expanded and the patient was discharged with the diagnosis of

right hydropneumothorax with broncho-pleural fistula.

The physical exam at the admission into the Thoracic Surgery Department showed decreased respiration in the right hemithorax with absent breathing on the right. Purulent secretion was leaking from the inserted five pleural catheters (Fig. 2). A chest X-ray showed right hydropneumothorax. The CT scan 2 weeks after the VATS procedure revealed trapped lung and solid lung nodule 17/11 mm in the apical segment of the right upper lobe with signs of cavitation (Fig. 3), partial pneumothorax with inserted five chest tubes, and cylindrical bronchiectasis in the right lower lobe.

Fiberoptic bronchoscopy before the surgery revealed a massive mucopurulent secretion from the right main bronchus which was aspirated. A foreign body with a metallic appearance, suspected to be an amalgam, was found in the right lower bronchus, which was extirpated in parts (Fig. 4). A granulation tissue was visualized with subsequent confirmation of inflammation from the biopsy.

Under general intubation anesthesia with a Carlens tube, a right posterolateral thoracotomy was performed. An obliterated pleural cavity was found. Through extrapleural dissection, a severely thickened parietal pleura was visualized, which was opened and entered into a loculated empyema cavity which was evacuated. A small sequester from the upper rib was excised. A trapped lung was visualized and decortication and partial pleurectomy were performed (Fig. 5). A part in the lower lobe with granulation tissue and detritus was found. Several lacerations that appeared during the decortication were sutured with 000 Merlin. The pleural cavity was lavaged with Braunol solution. Two chest catheters were inserted.

The pathohistological result showed a non-specific chronic granulomatous inflammatory process.

The patient was discharged uneventfully 14 days postoperatively. One month after surgery, the performed chest X-ray showed a fully expanded right lung (Fig. 6).

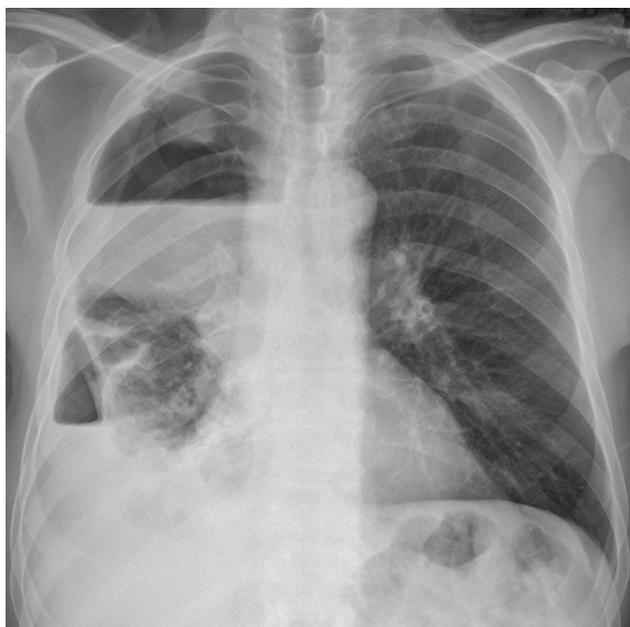


Figure 1. Chest X-ray before the VATS.



Figure 2. Patient's chest with the five chest drains at admission.

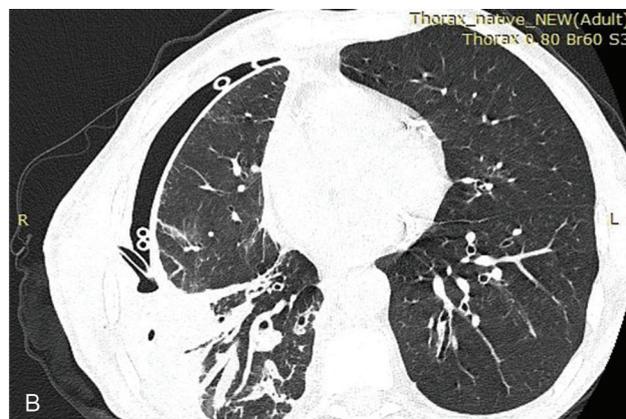
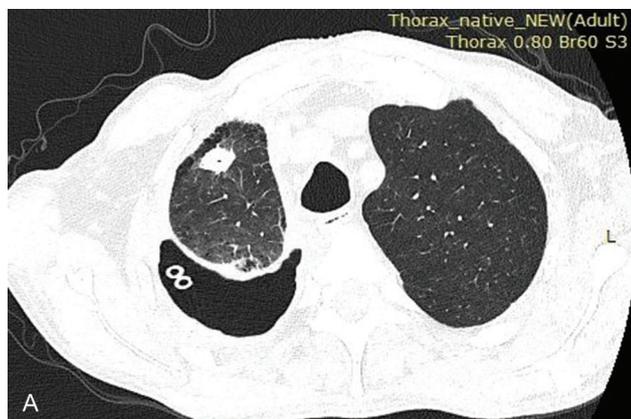


Figure 3. (A, B) CT scan before the thoracotomy showing a nodular lesion in the right upper lobe, an unexpanded right lung, and cylindrical bronchiectasis in the right lower lobe.



Figure 4. Multiple particles of the metallic foreign body.

DISCUSSION

We present a case with right chronic pleural empyema, ineffectively treated with chest drainage, uniportal VATS, and insertion of five chest drains. An endoscopic extirpation of a foreign body in the right lower lobar bronchus was performed. Right posterolateral thoracotomy, decortication, and pleurectomy were performed because of a trapped right lung.

One study reported 0.07 per 100,000 persons/year hospitalization due to occult bronchial foreign body in adults.^[3] The average age of patients with FB aspiration is 48 years,

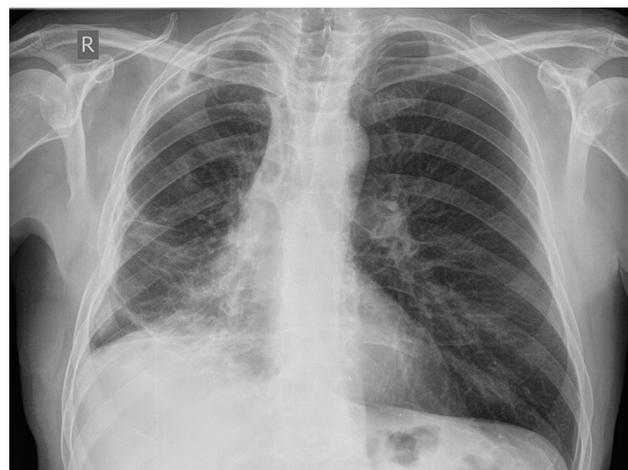


Figure 6. Chest X-ray one month after the surgery showing expanded right lung.

with males predominating at a ratio of 1.5:1.^[4] Usually, it is attributed to swallowing problems, neurological dysfunction, trauma, impaired consciousness, and abuse of alcohol or drugs.

The most common symptoms of a non-asphyxiating FB are cough (66.1%), choking (27%), dyspnea (26.6%), fever (22.2%), and hemoptysis (17.2%).^[4] Another study reported the rate of FB-related complications (79.5%) as follows: granulation formation – 76.5%, postobstructive pneumonia – 22.0%, hemorrhage – 14.5%, atelectasis – 10.0%, and endobronchial stenotic scarring – 8.0%.^[5] Other complications are abscess formation, airway perforation, bronchiectasis, and empyema. Our patient did not report aspiration. He developed postobstructive pneumonia, bronchiectasis, and parapneumonic effusion, which complicated as pleural empyema.

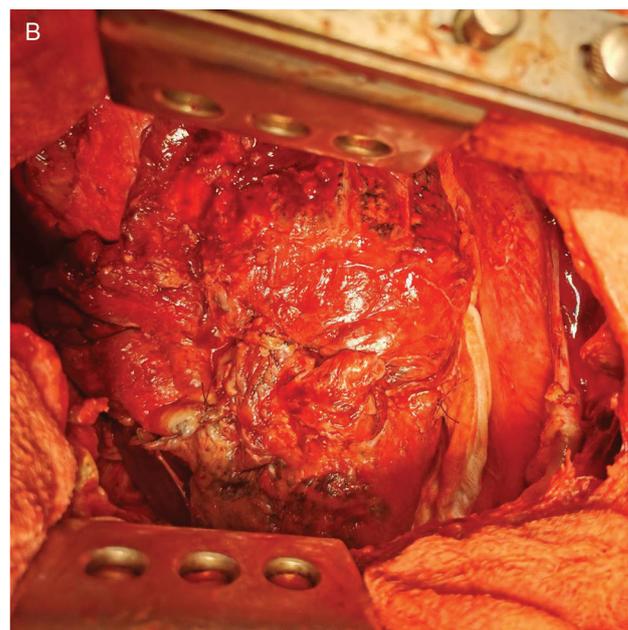


Figure 5. A. Intraoperative image of pleurectomy and decortication. **B.** Decorticated and expanded lung.

Metallic or bone FB are radiopaque and are well visualized on chest X-ray as opposed to many vegetable or plastic matters which are radiolucent. The visualization of atelectasis, lung collapse, lung infiltrates, bronchiectasis, air trapping, and mediastinal deviation on the chest radiographs is indicative of aspiration of FB.^[6] FBs are more common in the right bronchial tree than in the left one (71.5% vs. 22.8%).^[4]

Large, persistent FB that causes endobronchial obstruction could be difficult to distinguish from endobronchial tumors on CT and bronchoscopy after the development of an inflammatory mass.^[7] Delayed diagnosis could lead to granulation and complicates the extraction.^[8]

Treatment options for chronic empyema consist of optimizing lung expansion by decortication, positive airway pressure, negative pleural pressure, open window thoracotomy, vacuum-assisted closure (VAC) therapy, empyema tube (tube thoracostomy), filling the potential pleural space with different measures as Clagett procedure, tissue flap transposition, and thoracoplasty.^[9] In chronic empyema, VATS decortication is the first treatment option as it gives better results compared to thoracotomy, but in patients with sepsis, unsuccessful previous VATS procedure, or severely trapped lung, thoracotomy should be considered.^[10]

CONCLUSIONS

This case emphasizes the importance of the development of pleural empyema due to missed foreign body aspiration. Preoperative bronchoscopy is recommended in all patients with pleural empyema before surgery. When chest drainage

and VATS are unsuccessful in expanding the lung in chronic empyema then thoracotomy, debridement, pleurectomy, and decortication are indicated.

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Развитие организованной эмпиемы плевры как результат оккультной аспирации инородного тела

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Резюме

Аспирация инородного тела (ИТ) у взрослых встречается редко. Многие пациенты не могут вспомнить эпизод аспирации и госпитализируются с осложнениями эндобронхиальной ИТ.

Мы представляем случай правосторонней хронической эмпиемы плевры, неэффективно вылеченной в другой больнице с дренированием грудной клетки, однопортовой VATS и установкой пяти дренажей грудной клетки в результате скрытой аспирации инородного тела. Произведена эндоскопическая экстирпация инородного тела правого нижнего долевого бронха. По поводу защемления правого лёгкого были выполнены правосторонняя заднелатеральная торакотомия, декортикация и плеврэктомия.

Предоперационная бронхоскопия рекомендуется всем пациентам с эмпиемой плевры перед операцией. Если дренирование грудной клетки и VATS не помогают расширить лёгкое при хронической эмпиеме, показаны торакотомия, санация, плеврэктомия и декортикация.

Ключевые слова

бронхоскопия, инородное тело бронха, операция, эмпиема плевры, неправильное лечение
