

He Got Nailed - A Case of Aspiration of a Metal Nail

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Abstract

Foreign body aspiration generally presents with choking, difficulty breathing and wheezing. We present a case of an 18-year-old male with a normal physical examination after aspirating a metal nail that was confirmed on chest radiograph. Flexible bronchoscopy was unsuccessful and bronchoscopy under general anesthesia was done to retrieve the metal nail. Diagnosis can be accomplished by history, physical exam and radiological evaluation which includes chest radiograph and chest CT. Treatment consists of removal of the object by flexible or rigid bronchoscopy. Complications of foreign body aspiration arise primarily as a result of missed diagnosis or failure to present in a timely manner resulting in delayed removal of the object.

Keywords: Foreign body aspiration; Bronchoscopy

Introduction

Foreign body aspiration into the airway is more common in the pediatric age group than in the adult population [1-4]. The location where the foreign body lodges generally depends on the size of the aspirated object and the clinical picture varies accordingly. The most common presenting symptom as a consequence of aspiration is "penetration syndrome". This is a sudden onset of choking and intractable cough with or without vomiting [5]. Other presenting symptoms are fever, shortness of breath and wheezing [5-7]. However, a small percentage of patients may not have any clinical symptoms post-aspiration.

We present a case of an 18-year-old male who had a normal physical examination after aspirating a metal nail that was confirmed on chest radiograph.

Case Report

A previously healthy 18-year-old male presented to the emergency department after aspirating a metal nail. The patient stated that he had a habit of chewing on things, and was doing so with the nail while walking, when he inadvertently swallowed it. He was in no acute distress, saturating 99% on room air and had a completely normal physical exam. Chest radiograph revealed a metal nail in a segmental branch of the left lower lobe bronchus, no focal airspace disease and no pneumothorax (Figures 1 and 2). An emergent flexible bronchoscopy was performed and was unsuccessful in retrieving the foreign body. He was started empirically on antibiotics for potential post-obstructive pneumonitis and was admitted for observation and a bronchoscopy under general anesthesia was planned. Fiberoptic bronchoscopy was performed through the endotracheal tube. Fluoroscopy was used as an aid and the nail was located in a segmental branch of the left lower lobe bronchus. The patient was also placed in trendelenburg position to help move the nail by gravity. The tip of the nail was pointing proximally, and by using a grasper and a basket, a 2.8 cm X 0.4cm nail was retrieved. There was no significant bleeding from the airway and the patient remained hemodynamically stable. Follow up of chest radiograph confirmed the absence of the previously visualized metallic nail along with evidence of left basilar sub-segmental atelectasis. The patient was discharged the following day with one week course of oral antibiotics for probable post obstructive pneumonitis.

Discussion

Risk factors for aspiration in the adult population include mental retardation, dementia, altered mental status, neurological disorders, recent dental manipulation, alcohol and drug use, laryngectomy and

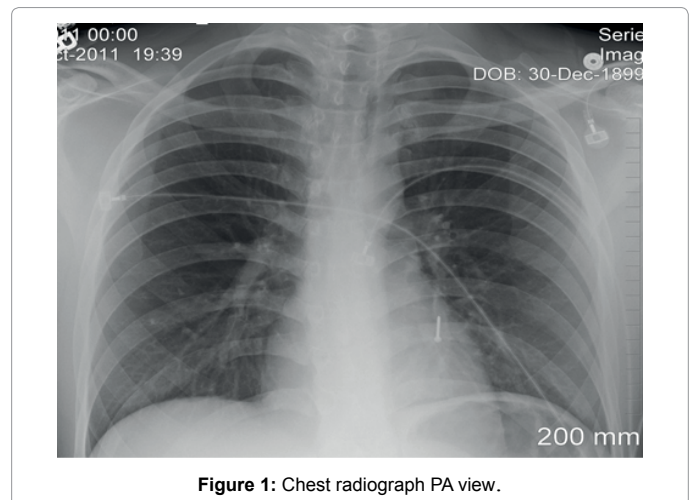


Figure 1: Chest radiograph PA view.

tracheostomy [4].

Right main bronchus is the most common site of foreign body obstruction. The reason seems to be because of the angulation between the right main bronchus and trachea, which is more obtuse compared to the left side [8,9]. The size of the object will eventually determine how far it will travel and lodge in the tracheo-bronchial tree.

Most patients who aspirate a foreign body often present to the hospital shortly after the event with acute "penetration syndrome". However, some adult patients may have a very subtle presentation and present late [7]. Complications of foreign body aspiration arise primarily as a result of missed diagnosis or failure to present in a timely manner resulting in delayed removal of the object. Such complications include recurrent and migratory pneumonia, hemoptysis, lung abscess, bronchiectasis, bronchiolitis obliterans organizing pneumonia,

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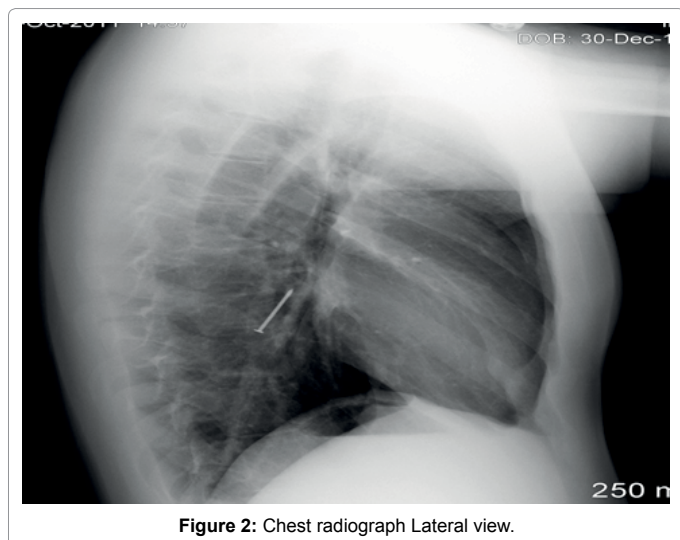


Figure 2: Chest radiograph Lateral view.

broncho-cutaneous fistula, granulomatous inflammation, bronchial stenosis and pneumothorax [10-12]. Complications including pneumonitis, severe airway disease leading to fibrotic stricture has been reported with pill aspiration [13].

Diagnosis of foreign body aspiration can be accomplished by history, physical exam and radiological evaluation [14]. Although history of the event is helpful but inadvertently it is missing. Clinical examination may reveal findings such as unilateral wheezing or decreased breath sounds. The 2-view chest and neck radiograph is the first step in diagnosis offering simple visualization of the object, particularly a radio-opaque body, as was the case in our patient. Chest radiographs also allows identification of any associated imaging complications (atelectasis, pneumothorax, post-obstructive pneumonia etc).

Radiolucent foreign bodies (organic objects such as peanuts, fruit seeds) are more frequently aspirated compared to sharp objects and may not be directly visible on chest radiographs [15-17]. In this setting inspiratory/expiratory views or decubitus radiographs may have some utility. The presence of secondary signs (mediastinal displacement, atelectasis, air trapping) on a chest radiograph can increase suspicion when visualization of the foreign object is not clearly evident [4,6,9,16-18].

Chest Computed Tomography (CT) has a higher sensitivity for detecting foreign body aspiration [4,17,19]. It can provide an advanced imaging and modern helical CT is extremely rapid in acquisition (<1 minute). Multi-planar or volume rendered reformats can be reconstructed from CT volume-acquisitions and aid in the evaluation of foreign body. Chest CT can diagnose foreign bodies not visualized on chest radiograph but occasionally can be obscured by organized secretions in the lung [14]. Although imaging studies are useful for the evaluation of foreign body aspiration in a non emergency setting, it should not delay intervention in the setting of life-threatening foreign body aspiration. Bronchoscopy and laryngoscopy are considered both diagnostic and therapeutic standard interventions for such life threatening aspirations.

Treatment consists of removal of the object by flexible or rigid bronchoscopy. Flexible bronchoscopy can usually be done under conscious sedation, but if unable to retrieve the object, general anesthesia may be used with either type of bronchoscopy. Bronchoscopic instruments such as a grasper and basket are usually sufficient for retrieval. The bronchoscopic cryoprobe has also been

documented as a useful tool by freezing the foreign body to the tip of the probe allowing easy extraction [20]. In rare instances where retrieval is not accomplished with either bronchoscopic technique, exploratory thoracotomy and bronchotomy may be necessary for foreign body removal [21].

This case is unique as rarely we encounter a metal nail aspiration. There are case reports about ingestion of such sharp objects with complications. Although our patient had no injury, one would expect additional complication in form of tracheo-bronchial injury related to this sharp, pointed object. Due to the shape of the nail, it has the propensity of travelling further distal in the bronchial segments which may make it difficult to be retrieved, necessitating advanced bronchoscopic instrumentation or surgical intervention.

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