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Distal Airway Aspirated Metallic Foreign Body, Case Report of Spontaneous Expectoration

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Male, 7-year-old
Final Diagnosis: Foreign body aspiration
Symptoms: Choking
Medication: —
Clinical Procedure: —
Specialty: Surgery

Objective: Unusual clinical course

Background: Foreign body aspiration is one of the life-threatening conditions seen in the adult and pediatric population with most cases occurring within the first 3 years of life. It can result in serious complications or even lead to death. Bronchoscopic removal has been described as the management of choice. Spontaneous expectoration could happen, though it is extremely rare.

Case Report: A 7-year-old male presented to the Emergency Department within 3 hours of aspirating a metallic nail. He had a brief choking episode at the beginning and remained asymptomatic thereafter. The initial chest x-ray showed a metallic foreign body (nail) at the retrocardiac area with patent centralized tracheobronchial tree. No radiologic signs of pneumothorax nor pleural or pericardial effusion. Computed tomography (CT) scan was performed the night of admission and revealed a 2 cm nail at the posterior basal segment of the left lower lobe bronchus. Bronchoscopy, thoracoscopic-removal, and possible thoracotomy were discussed. Management options and complications were explained. The parents preferred to wait and observe before making any decision regarding surgical intervention. Surprisingly, while in the hospital, the patient had repetitive cough and the nail was spontaneously expectorated.

Conclusions: Urgent bronchoscopy for foreign body aspiration is mandatory as early as possible, however, expectant management in asymptomatic distal airway foreign body aspiration is reasonable. Spontaneous expectoration is a possible outcome though extremely rare.

MeSH Keywords: Foreign Bodies • Pediatrics • Thoracic Surgery

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/917608>



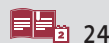
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Background

Foreign body aspiration is one of the life-threatening conditions seen in the adult and pediatric population with most cases occurring within the first 3 years of life. It can result in serious complications or even lead to death. Bronchoscopy has been described as the management of choice for definitive diagnosis and removal of a foreign body. Spontaneous expectoration could happen, but it is very rare.

Herein, we report an extremely rare incidence of spontaneous expectoration of a 2 cm metallic nail lodged at the distal airway 4 days after aspiration without any complication.

Case Report

A 7-year-old male presented to the Emergency Department with history of metallic nail aspiration. His mother had witnessed this incidence as her son was playing and jumping while holding the nail between his lips. She brought him for care within 3 hours. He had a brief history of choking at the beginning of the incident and remained asymptomatic thereafter. He had no past medical or surgical history. His vital signs were within normal ranges. There were no stridor or clinical signs of respiratory

distress. He had clear air entry on chest auscultation and soft abdomen. Chest x-ray showed a metallic foreign body (nail) at the retro cardiac area, patent centralized tracheobronchial tree without any signs of pneumothorax, pleural or pericardial effusion (Figures 1, 2). Chest computed tomography (CT) scan revealed a 2 cm nail at the posterior basal segment of the left lower lobe bronchus (Figure 3A, 3B). Considering foreign body lodgment at the distal airway, the patient was scheduled for emergency bronchoscopy for foreign body removal including rigid and flexible with the possible need for thoracoscopy/thoracotomy if the bronchoscopy failed. Risks, benefits, and expected complications were explained. The parents preferred to wait and observe before making a decision regarding any intervention. Four days later, the patient had repetitive coughing and the nail was spontaneously expectorated. The nail was intact, rusted, and covered with sputum (Figure 4). No chest pain, hemoptysis, or dyspnea was encountered after expectoration. Repeated chest x-ray confirmed that the nail was no longer seen (Figure 5). The patient was discharged home without any consequences.

Discussion

Foreign body aspiration is one of the life-threatening conditions, however, it is a poorly covered topic in textbooks [1]. The incidence is higher among young children, most of the reported cases are of children between 1 and 3 years of age. Children aged 5 years or more account for 15% while 75% of patients are younger than 3 years [2–4]. Boys tend to account

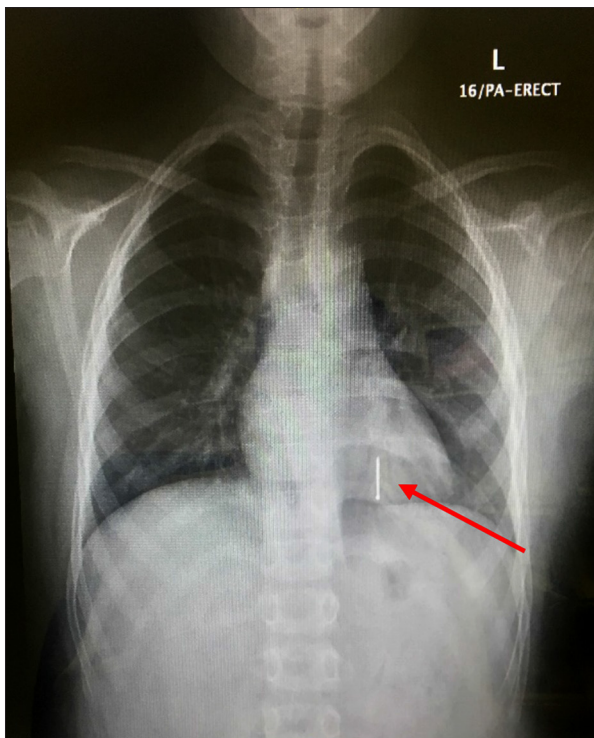


Figure 1. Posteroanterior (PA) view: x-ray shows a metallic foreign body (nail) in retrocardiac area (arrow). The tracheobronchial tree appears to be patent and centralized without any signs of pneumothorax.

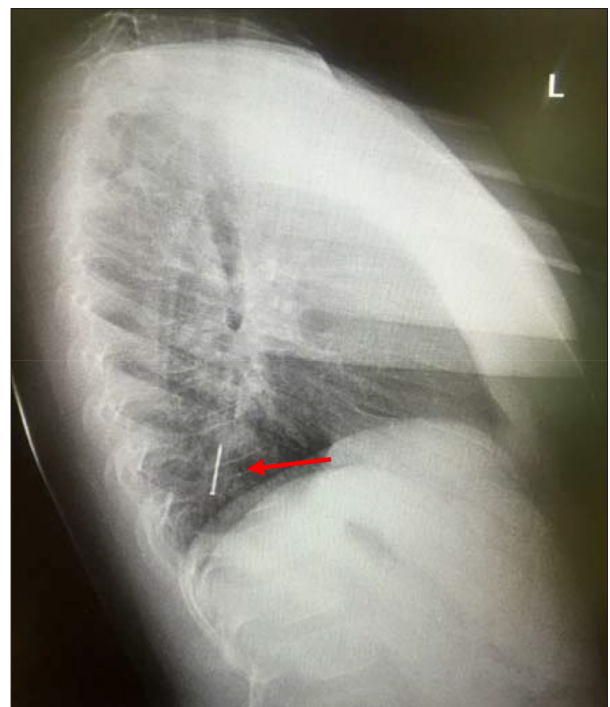


Figure 2. Lateral view.

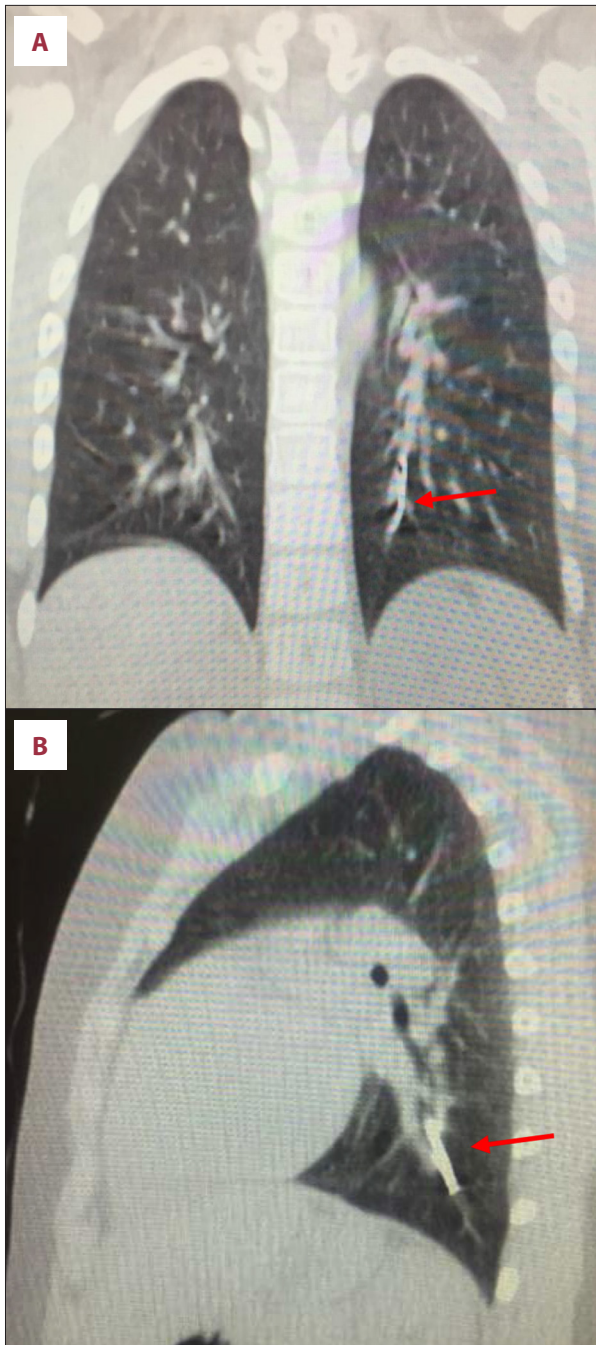


Figure 3. (A, B) Computed tomography scan of the chest shows 2 cm nail in the posterior basal segment of the lower lobe bronchus (arrows).

for a higher number of cases compared to girls in the same age group [5].

In the USA, foreign body aspiration is a leading cause of incidental death in infants [6]. The reported mortality rate of foreign body aspiration is 1 per 100 000 in children who are 4 years old or younger [7].



Figure 4. Picture of the foreign body after spontaneous expectoration. It is 2 cm long rusted nail.

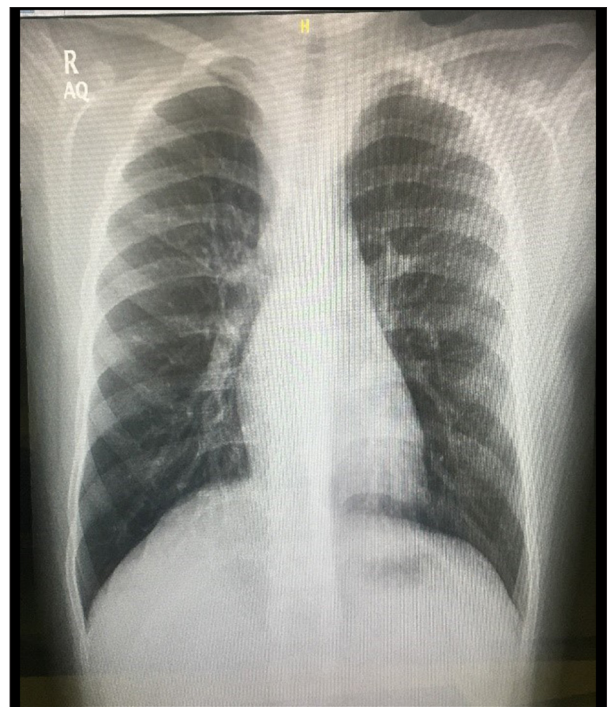


Figure 5. Repeated chest x-ray: the foreign body is no longer seen.

Fortunately, the number of death due to foreign body aspiration has been decreasing in recent years due to preventive educational programs [2].

Different types of foreign bodies have been reported, with organic material reaching 60% to 81% of cases (i.e., popcorns, vegetables, nuts, and sunflower seeds) [8,9]. Peanut inhalation is the most common reported organic foreign body aspiration in North America. The non-organic foreign bodies include

toy particles, pen tops, and pins are less commonly reported, ranging from 6.5% to 25% of cases [4,10].

Bronchoscopy is the management of choice in removing a foreign body and should be performed early upon admission to avoid any serious complications (whether short-term or long-term complications) i.e., recurrent pneumonia, atelectasis, bronchiectasis, lung abscess, pneumothorax, and mediastinitis [11]. In our case, bronchoscopy was offered early as an emergency intervention including rigid and flexible scope with other surgical options offered in the same sitting including thoracoscopy possible thoracotomy. However, any procedure was postponed as the parents asked for close observation. Delaying the procedure to the next available daytime operating list does not cause additional morbidity in clinically stable patient and it allows optimal preparation for such procedure [12].

Spontaneous expectoration has been reported in the adult and pediatric population with an incidence of 1% to 2% of cases [13]. The time interval between foreign body aspiration and spontaneous expectoration varies between reported cases. It can be early as 2 hours after aspiration or as late in life as 27 years after the aspiration [14,15].

Spontaneous expectoration of different types of intrapulmonary foreign bodies has been reported in the literature. Examples include food particles such as sunflower seeds, and non-organic materials such as toy particle, a small lamp, scarf pin, needle, and nail [16–18]. Interestingly, 1 case reported spontaneous expectoration of a tooth from the right main bronchus [19]. Even a polyp may detach, as in a case reported by Terashima et al., where the patient was able to cough up a 1 cm sized polyp from the right middle bronchus [20]. A few other cases of extra pulmonary foreign body expectoration were also reported. Three cases reported spontaneous expectoration of gunshot bullets lodged in different location within the chest: left pulmonary hilum, left hemothorax, and near to tracheal bifurcation [21–23].

It has been suggested that the chance of spontaneous expectoration is affected by 2 factors, the time of aspiration and the location of lodgment within the airway; if the time is more than 24 hours and in the proximal airway, spontaneous expectoration is possible [16]. ON the contrary, our patient had aspirated a foreign body that resided in the distal airway (left

lower lobe bronchus) and spontaneously expectorated 4 days after aspiration.

Spontaneous expectoration can avoid the risk of anesthesia and complications related to bronchoscopy intervention or surgery if bronchoscopy fails. Due to the rarity of spontaneous expulsion, bronchoscopy removal should be attempted as early as possible to avoid any serious complications (i.e., pneumonia, emphysema, pneumothorax, atelectasis, perforation, and tracheal laceration).

Spontaneous expectoration is not totally safe, there is a risk that the foreign body will get stuck in the subglottic area or even injure the airway if sharp enough, thus causing a life-threatening emergency [18]. In some patients, the foreign body can be expectorated and ingested to the gastrointestinal tract, this may lead to unnecessary bronchoscopy especially if the x-ray is not repeated prior to bronchoscopy or if the family and patient did not mention any history of bouts of coughing [24]. In our case, despite a long sharp nail having been expectorated, the patient showed no signs or symptoms of post expectoration complications and was sent home in a stable condition.

Conclusions

Bronchoscopy has been described as the management of choice and a life-saving procedure when a foreign body is aspirated. It should be performed early avoiding any serious complications. Spontaneous expectoration can happen in very rare cases. We described in this case study, an extreme rare incidence of spontaneous expectoration of a metallic nail aspirated in the distal airway without any consequences. Short-term expectant management for distal sharp foreign body non-approachable by bronchoscopy and causing no complication such as pneumothorax or abscess formation is safe, particularly if the patient is stable. However, close monitoring is advised, and available surgical intervention is paramount.

Department and Institution where work was done

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