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Case Report: Post-Obstructive Pneumonia Secondary to Foreign Body Aspiration

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Abstract:

Post-obstructive pneumonia is described as a pulmonary infiltrate that occurs proximal to the site of an obstructed bronchus. Studies show that post-obstructive pneumonia most commonly secondary to obstruction caused by neoplasms. According to a study done on post obstructive pneumonia in lung cancer, most cases of post obstructive pneumonias are associated with advanced neoplasms with up to 50% of those with advanced cancer getting endobronchial compromise. While neoplasms are the most common cause of post obstructive pneumonia, research is scarce on other potential causes of post obstructive pneumonia. This case reports presents a unique clinical case in which an adult patient developed post obstructive pneumonia secondary to foreign body ingestion.

Case Presentation:

A 63 year old male with past medical history of chronic back pain and anxiety presented to the emergency department for a complaint of cough and shortness of breath for one week. Of note, the patient mentioned that he had an aspiration event a week ago during which the patient fell asleep with a mouth full of pistachios. The patient then woke up coughing and his wife performed the Heimlich maneuver on him with some expulsion of pistachios. Since then, the patient has been experiencing a persistent cough and shortness of breath. The patient denied any other symptoms such as chest pain, rhinorrhea, fever, nausea, vomiting, or abdominal pain. . Vitals are as follows: blood pressure 134/60 mmHg, heart rate 80 bpm, respirations 19, temperature 37 C, pulse oximetry 89% on 6 L nasal cannula. Physical exam was significant for diminished breath sounds in the left lower lung field, otherwise unremarkable. Patient's lab work, which included CBC, BMP, magnesium, phosphate, lactate, blood cultures, was noted to have an elevation in WBC at 29.8 10^9/L, with the remaining lab work within normal limits. The patient had a chest x-day which revealed a complete white out of left side of lung. CTA chest demonstrated near complete left lung collapse and mucous like material in the left main stem bronchus. EKG showed normal sinus rhythm 79 beats per minute, QTc 474, nonspecific ST changes without any signs of ischemia.

The patient was placed on high flow nasal cannula in the ED with improvement in oxygen saturation up to 96%. The patient was also given one dose of IV vancomycin and zosyn in the emergency department to empirically cover for pneumonia. The patient was admitted to the ICU for complete white out of left lung possibly due to pistachio foreign body ingestion and potential further evaluation with bronchoscopy.

After admission to the ICU, the patient was taken to the bronchoscopy suite underwent a fiber optic bronchoscopy. The offending pistachio was found lodged in the left main bronchus that appeared to be filled with mucus that was overflowing into the right main stem bronchus. Multiple attempts were made to capture the pistachio however they were unsuccessful. The patient eventually underwent a rigid bronchoscopy and a telescopic peanut grasper was used to remove the shelled pistachio. A significant amount of pus was present behind the post obstructive mucoid impaction that required multiple washes. This second attempt was deemed successful and patient remained in the ICU for several days and received IV antibiotic treatment for post-obstructive pneumonia. Patient was discharged 5 days later on oral antibiotics.

46-year-old female with a history of cerebral palsy, chronic urinary tract infections, breast cancer with mastectomy, deep vein thrombosis, and osteomyelitis presented to the emergency department with complaints of a blocked foley catheter. The patient reported noticing leakage around the catheter on Friday and observed a purple discoloration in the catheter bag over the weekend. The patient had a prior history of klebsiella on urinary cultures and was scheduled for a catheter replacement on March 23, 2023.

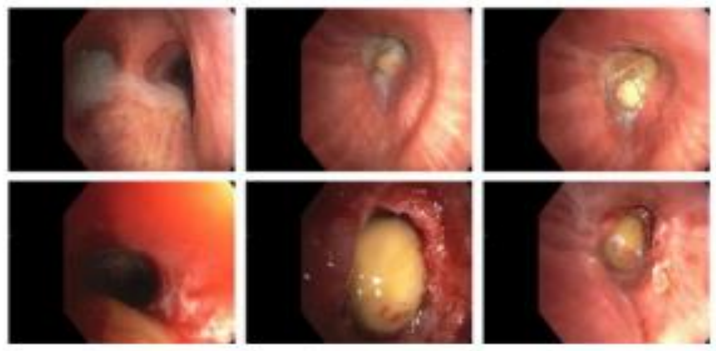

Figure 1: mucoid impaction and pus proximal to aspirated pistachio

Case Presentation: (continued)

Upon arrival, the patient's vital signs were stable, with a blood pressure of 159/83, heart rate of 79 beats per minute, temperature of 97.9°F, respiratory rate of 18, and SPO2 of 98% on room air. The patient's BMI was 22.71 kg/m².

Physical examination revealed a non-toxic, well-appearing female with an indwelling Foley catheter. The tubing was discolored with white sediment crystals, likely the cause of the obstruction, as well as a purple film lining the tubing. The entire Foley bag was filled with purple-colored urine. The patient had no significant social history, and her medication list did not appear to be causative of the discoloration.

The patient's lab results revealed mild leukocytosis with predominant neutrophils at 83.6%. The urine was brown in color and cloudy, with a specific gravity of 1.012 and pH of 7. It showed 2+ proteinuria, negative for glucose and bilirubin, and had one plus ketones and 3+ blood. The urine was nitrate negative, had a normal amount of urobilinogen, and showed 3+ leukocyte esterase with greater than 182 white and red blood cells on microscopy. Microscopy also revealed clumped white blood cells and moderate bacteria, as well as budding yeast on mycology. The urine culture grew over 100,000 colonies of E. coli and 50,000-99,000 colonies of mixed gram-positive and gram-negative flora, susceptible to ceftriaxone. The patient was eventually discharged with a prescription for Bactrim to be taken for seven days.

Discussion:

Pathophysiology:

It has been studied that Lung malignancy can cause luminal airway obstruction from various mechanisms, some of which include tumor or enlarged lymph nodes compressing the intraluminal airway and causing endobronchial obstruction. The obstruction causes stasis of secretions in the bronchi distal to the obstruction which then predisposes bacteria to colonize and form an infection. Additionally, patients with lung cancer have immune defects which predisposes them to developing lung infections (Valvani, 2019). It can be proposed that similarly to lung malignancy, foreign body aspiration could also potentially cause stasis of secretions distal to the foreign body and result in post-obstructive pneumonia as seen in this case report. As visualized by the bronchoscope, the aspirated pistachio created an obstruction in the left main bronchus distal to which mucoid and pus-like material was formed (figure 1). The duration of the pistachio in the left main bronchus for 1 week allowed to post-obstructive mucoid impaction to occur.

Discussion: (continued)

Clinical presentation:

The clinical symptoms of foreign body aspiration includes non resolving cough, dyspnea, chest pain, hemoptysis, and recurrent pneumonia (Holmes, 2016). The clinical symptoms of post-obstructive pneumonia includes cough, dyspnea, and fever with chest pain and hemoptysis being less common (Valvani, 2019).

Research is sparse on post obstructive pneumonia secondary to foreign body aspiration, but it can be concluded that clinical symptoms most commonly includes shortness of breath and non-resolving cough. A prospective study revealed that patients with post obstructive pneumonia due to malignancy had a longer duration of symptoms as compared to patients with bacterial pneumonia. However, since patients with post-obstructive pneumonia secondary to foreign body aspiration are not immunocompromised as those patients with lung malignancy, the duration of symptoms should not be longer that those with bacterial pneumonia in these instances.

Diagnosis:

The gold standard for diagnosis of post obstructive pneumonia secondary to foreign body aspiration is direct visualization with bronchoscopy. Initial evaluation of post-obstructive pneumonia is typically done with a chest radiograph. CT of chest is more sensitive in characterizing the pneumonia and determining the site of obstruction (Valvani, 2019), especially when IV contrast is used than chest radiograph. Ultimately, fiber optic bronchoscopy is optimal in diagnosis and therapeutic intervention for post-obstructive pneumonia secondary to foreign body aspiration.

Management:

Treatment of post obstructive pneumonia due to foreign body aspiration requires removal of the obstruction and antibiotic therapy for infection. The obstruction is most often removed with bronchoscopy, either flexible or rigid. Antibiotic therapy is targeted towards organisms that typically cause aspiration pneumonia.

Prognosis:

Post obstructive pneumonia secondary to foreign body aspiration can be definitively treated with removal of foreign body and antibiotic therapy. If foreign body is unable to be removed, the duration of antibiotic therapy is unknown and prolonged therapy may be necessary if empyema develops.

Conclusions:

Post obstructive pneumonia is commonly seen with lung malignancy and research is scarce on other causes of post obstructive pneumonia. This case demonstrated foreign body aspiration as a cause of post-obstructive pneumonia. If patient history is suspicious for foreign body aspiration consider CT/CTA chest for evaluation and further work up with bronchoscopy. Gold standard treatment for post-obstructive pneumonia secondary to foreign body aspiration is fiberoptic or rigid bronchoscopy to remove the foreign body and antibiotics that cover for organisms similar to aspiration pneumonia.

References:

Available on request