



BRONCHOLITHIASIS AS RECURRENT PNEUMONIA: A CASE REPORT

General Medicine

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ABSTRACT

Broncholithiasis or pneumoliths are rare clinical entities in day to day clinical practice. Broncholiths are calcified peribronchial lymph nodes in tracheobronchial tree and are the cause for bronchiectasis, haemoptysis and recurrent pneumonia. Here we present a case of a young teen boy presented with repeated pneumonias with broncholithiasis on bronchoscopic evaluation.

KEYWORDS

Broncholiths, bronchoscopy, recurrent pneumonia.

INTRODUCTION

Broncholithiasis has been found in literature dating back to 200 BC with cases reported by the Galean and Aristotle in 300 BC and by Groftenberg in 1600 and Boerhaave in 1700 with descriptions of patients "spitting stones" (Shenoy & Nanjappa, n.d.).

Broncholithiasis is an uncommon condition where calculi (calcified) are present in tracheobronchial tree. Broncholithiasis by definition means a condition where calculi are formed in the bronchus. The pathogenesis of broncholithiasis may be extrabronchial as well as endobronchial, in the light of pathogenesis broncholithiasis definition does not hold true with the formation of calculi with in the bronchus (T. Lee, Woods, & Hagan, 2013). A broncholith is defined as the "presence of calcified material within a bronchus or within a cavity communicating with a bronchus". Broncholiths are calcified peribronchial lymph nodes that erode into the adjacent tracheobronchial tree subsequent to an inflammatory process (Sajal De, 2008).

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There are two types of broncholiths, fixed and mobile. Mobile broncholiths are either loose in the airway or move when probed with bronchoscopic instruments during bronchoscopy. Fixed broncholiths do not exhibit any movement when probed during bronchoscopy (Sajal De, 2008).

The clinical presentation of broncholithiasis is determined mainly based on its site and level of obstruction in tracheobronchial tree (Krishnan et al., 2018). Patients will present with symptoms only when the broncholith impinges on or erodes airway. Bronchial luminal erosion by broncholiths can cause "bronchiectasis, cough, recurrent pneumonias, haemoptysis and shortness of breath, coughing out of broncholiths (lithoptysis)". The commonest infectious complication of broncholithiasis is bacterial pneumonia secondary to airway obstruction by a broncholith associated with airway inflammation and edema (Dakkak, Siddiqi, & Cury, 2015). Life-threatening complications, such as massive haemoptysis or broncho-oesophageal fistulas, can occur (Krishnan et al., 2018). Lithoptysis, though a rare presentation, is a pathognomonic sign, and following lithoptysis patient get relieved of bronchial obstruction symptoms. In majority of cases presentation is similar to lower respiratory tract infection and non specific, leading to diagnostic delays. Silicosis, malignancies,

mycobacterial, fungal, histoplasmosis - granulomatous infections are the reported causes of broncholithiasis, but most common cause is mycobacterial granulomatous lymphadenitis all over the world. The complications of broncholithiasis are hyperinflation, atelectasis, bronchiectasis, obstructive pneumonia, bronchogenic dissemination of tuberculosis and lung abscesses (Ahmet Bircan, 2014). Radiologically broncholithiasis may manifest with signs of bronchial obstruction and with significant changing position or disappearance of a calcified focus on repeat radiographs (Pinheiro, Jansen, & Anta, 2002).

Bronchoscopy is the diagnostic procedure for diagnosing broncholithiasis, but role of bronchoscopy for treatment is still debatable (Krishnan et al., 2018). In terms of mortality and morbidity involved in surgical interventional approach to broncholiths, bronchoscopic management is preferred modality for patients with loose or partly eroded broncholiths. In case of patients with fixed broncholiths both surgical and bronchoscopic intervention carries considerable risk of massive bleeding while excision of broncholiths from bronchial luminal wall and preferred mode of intervention is still controversial. Removing a broncholith which is fixed to the wall of the bronchus may lead to profuse hemorrhage because of proximity of pulmonary artery branches to the tracheobronchial tree. Symptomatic broncholiths can be removed at thoracotomy, by managing pulmonary artery. Vowing to difficulty in the surgical procedure of thoracotomy it is better performed by thoracic surgeons experienced in the management of granulomatous disease. Generally lobectomy or segmentectomy is needed, as removal of the calcified mass will almost always take a part of the tracheobronchial tree (J. H. Lee, Ahn, Shin, Kim, & Kim, 2012).

In the present case in discussion we reported a young teen male patient representing with repeated episodes of pneumonia secondary to broncholithiasis.

CASE REPORT:

A 19 year old male student presented to our outpatient department with history of cough and chest discomfort since 1 week. Cough is persistent and not associated with any expectoration and no history of haemoptysis, no history of diurnal variation or positional variation in the intensity cough. Patient denies any history of fever, shortness of breath, and chest pain, and denies having habit of smoking. On enquiring about any past illnesses, patient gives history of cough with expectoration and breathlessness on exertion for 1 week, 2 years back and was admitted in hospital for 4 days and treated for pneumonia, 1.5 year back patient was admitted in hospital with similar complaints and was treated as pneumonia and was discharged. 3 months back patient developed similar complaints and based on chest radiological films (figure 1) and history of loss of appetite patient was started on anti tubercular drugs and was on regular medication till present admission.

Patient was subjected to sputum examination, as patient was not producing sputum; we tried inducing sputum with 3% sodium chloride and sodium bicarbonate nebulisation and throat suctioning. Despite of best efforts sputum sample could not be obtained, patient was

subjected to bronchoscopy and broncho-alveolar lavage. On bronchoscopy multiple bronchololiths are found in the right lower lobe in intermediate segmental bronchi (figure 2, 3, and 4) and bronchoalveolar lavage microscopy was done and found to be negative for acid fast bacilli and montaux test was negative.

Following bronchoscopy and bronchoalveolar lavage, bronchololiths could not be washed out and patient is put on broad spectrum antibiotics for 10 days and patient is on regular follow-ups and is being monitored for recurrent symptoms of respiratory tract infections.



Figure 1: Chest radiograph showing right lower zone air bronchogram.



Figure 2: Bronchololith at right lower lobe intersegmental bronchus



Figure 3: Bronchololith



Figure 4: Bronchololith at the division of intersegmental bronchus.

DISCUSSION

Bronchololiths is a rare condition where calcified peribronchial lymph nodes that encroach upon the adjacent airways and they cause clinical manifestations and abnormalities in the chest radiographs (Yi et al., 2005). Presenting symptoms of bronchololiths are vague, nonspecific and with wide range of symptoms diagnosis is difficult.

Bronchololiths can be found anywhere in the tracheobronchial tree with a propensity of developing in the right anterior superior segment of the upper lobe and the bronchus intermedius, and in the right middle lobe bronchus, due to narrowness and angularity with lymph nodes, which may lead to the middle lobe syndrome (Shenoy & Nanjappa, n.d.).

Bronchololiths or pneumololiths pathogenesis is not exactly known but

proposed pathophysiology is “calcification of peribronchial lymph nodes as a result of granulomatous infection leading to inflammation resulting in nodes turning into alkaline during the healing there by promoting calcium phosphate and carbonate precipitation which finally aggregate forming calcified deposits and with continuous movement of heart and lungs, pneumololiths rupture the adjacent structure leading tracheobronchial tree erosions (Shenoy & Nanjappa, n.d.).

Symptoms of presentation and signs of pneumololiths are nonspecific. “Most common presentations are “chronic cough (100%), fever (50%-60%) hemoptysis (45-50%), localized wheezing (25-60%), and chest pain (20%) stone expectoration (15-26%)”. Rare complication like recurrent pneumonia, massive haemoptysis and fistulas between the bronchi and adjacent mediastinal structures” (Sajal De, 2008). “Residual cylindrical bronchiectasis is the most common complication” (Fox & Clerf, 1945).

Bronchoscopy and CT Thorax are the preferred modalities of investigations in case evaluating for bronchololiths. As there are no consensus and guidelines for the modality of treatment, diagnosing and treatment of the same is very challenging and treatment should be customized according to the patient’s condition, type (fixed/free), site, size and complications of bronchololithiasis. In case of free bronchololithiasis, bronchololiths can be removed by broncho-alveolar lavage by bronchoscopy but in case of removal of fixed bronchololiths results could be devastating resulting in massive haemorrhage.

In the present case in discussion, patient has fixed bronchololiths in right lower lobe in the intersegmental bronchus. Following bronchoalveolar lavage, no bronchololiths could be removed from tracheo-bronchial tree and patient was put on antibiotics and after symptoms have subsided patient is discharged and is on regular follow up and was advised to refer for surgery (thoracotomy) in case of recurrent pneumonias and persistent symptoms.

CONCLUSION:

From the present case in discussion it is evident that recurrence of respiratory tract infections in a case one has to bear in the mind about deficiencies of congenital and acquired immunity and bronchololithiasis, even though the incidence is rare. It is prudent to look for the etiology of recurrence of infection rather than only treating the acute presentation.

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