



ORIGINAL RESEARCH PAPER

Pathology

BRONCHOPULMONARY LITHIASIS- SUSPECTED ON SPUTUM EXAMINATION

KEY WORDS: TB, AFB, DOTS, USG

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ABSTRACT

Bronchopulmonary Lithiasis presents as calcified lesions found on chest imaging. Although “spitting of stones” has been described for centuries, the diagnosis of the disease is often delayed for several years. Broncholithiasis is characterized by bronchial erosion or distortion due to hilar or parenchymatous calcifications and is usually related to infectious etiologies, such as Tuberculosis or fungi like Histoplasmosis. This paper reports 2 cases of the above said condition, seen in 2 young males, between 1994 to 2001 at TB Hospital, Bhopal and state TB demonstration cum Training Centre ,Bhopal.

INTRODUCTION:

Bronchopulmonary Lithiasis is a well documented, condition seen infrequently in patients presenting with pulmonary diseases, including TB. The incidence has been reported to be higher in TB patients who have hilar lymphadenopathy. These lymph nodes tend to calcify, break-down and produce microliths⁽¹⁾ Micro alveolar lithiasis, an associated condition , is also documented ,where in small deposits of calcium (microliths) form as concretions in alveoli, causing symptoms and recurrent problems.⁽²⁾

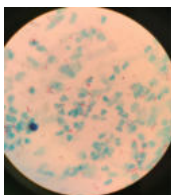
Case Summary: The patients were aged 28 yrs and 40 yrs called as Patient 1 and 2 respectively. Both of them had been known cases of Pulmonary TB for past several years and who had taken irregular treatment previously, from private medical sector as well as from the National tuberculosis Programme (NTP).

Patients complained of mainly coughing out “*Tiny Bone like bits in sputum*” along with weight loss , anorexia, Pain in chest, feeling of rawness in chest, acidity, malaise and blood streaked sputum, off and on.

Clinical examination revealed mild pallor in both, swelling of feet (pedal edema) in patient 2, mild clubbing (grade 1) in patient 1. Auscultation revealed basal respiratory crept in both the patients.

Examination of sputum

Macroscopic examination may reveal white or grayish white concretions in sputum. Upon staining with Romanowsky dyes these concretions stain bluish.



Sputum Smear Examination:- AFB Positive 3+ Slide



Sputum smears showed white crystalline calculi, as shown in the slides 1 and 2 above

SKIAGRAMS of chest in “patient 2’ revealed mild mottling shadows, while in “patient 1” unilateral hilar lymphadenopathy was seen.

Anti tubercular therapy with DOTS converted the sputum from AFB positive to AFB Negative. However, breathlessness and pain chest required mucolytic agents which only abated the symptoms temporarily, providing partial relief only. One Patient died a year after treatment due to massive hemoptysis.

The occurrence of **BRONCHOPULMONARY LITHIASIS** or **MICROLITHIASIS** should thus be borne in mind while attending patients who present with history of coughing, “bone like” or “stone like bits “and thus patients, should be further examined extensively.

DISCUSSION:

Broncholiths are endogenous calcified material within tracheobronchial tree. According to extended definition (3), broncholithiasis include all patients with peribronchial calcified node with distortion of the bronchi, as demonstrated by roentgenography or by bronchoscopy.

Broncholiths are classified into two groups (4)

According to their origin:

- (a) **Intrinsic calculi**, developed from the lung, bronchi and lymph nodes and which may be subdivided as follows:
 - (i) senile calcifications of the elastic cartilage of the bronchi and subsequent sequestration.
 - (ii) Metastatic calcification due to hyperparathyroidism, multiple myeloma, renal rickets, etc. This type of calcification occurs peripherally and rarely results in broncholithiasis.
 - (iii) Dystrophic calcification of necrotic, inflamed or degenerated tissue (the most common mechanism).
- (b) **Extrinsic calculi**, developed from aspirated foreign bodies, secretions and dusts (rare). Broncholithiasis has a various etiology.

The most common etiological agent is granulomatous lymphadenitis due to fungal or mycobacterial infection. The calcified peribronchial lymph nodes may cause erosion of the tracheobronchial tree due to respiratory movement or cardiac pulsation. Most preferred sites are known to be the proximal right middle lobe bronchus and the origin of the anterior segmental bronchus of the upper lobes because of the airway anatomy and lymph node distribution.(5) The broncholiths are usually gray-white and varying in size and usually irregular in shape and often possess spur like projections or sharp edges. The chemical composition is of

calcium phosphate (85-90%) or calcium carbonate (10-15%). Organisms are rarely detected in extracted broncholiths. However, Weed et al (6) histopathologically examined broncholith from 9 patients and observed that they had originated from either *Histoplasma capsulatum* or *Nocardial* infection. Broncholiths arise within intrathoracic tissues which were previously infected with tubercle bacilli. However, broncholiths are infrequent during active pulmonary tuberculosis. Stivelman (7) reported one case in 5,000 active cases of tuberculosis, while Zahnlo (8) noted a single case among 4,000 patients. Broncholiths can cause distortion, irritation, and erosion of bronchus. Pulmonary signs and symptoms are non specific. Most common presentations (9) 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 (9) had also been reported. USG abdomen showed moderate to gross ascitis with bilateral pleural effusion with normal kidney and altered hepatic echo texture. Diagnostic ascitic and pleural fluid aspiration were done. Treatment options are simple observation, bronchoscopic removal or surgery. Spontaneous broncholith expectoration may occasionally lead to resolution of symptoms.

Management of the large symptomatic broncholith is controversial. Menivale et al (10) suggested bronchoscopic removals should be considered in cases of uncomplicated and loose broncholithiasis, whereas surgical management should be chosen in complicated cases. The majority of broncholiths can be managed by bronchoscope. Nollet AS et al (11) suggested broncholiths should be removed under rigid bronchoscope. As broncholiths are usually associated with extensive granulation tissue, removal of symptomatic broncholith by fiber optic bronchoscope is difficult and may cause massive bleeding (12). Large broncholith can be fragmented by YAG laser and subsequently fragments can be removed by fibre optic bronchoscope (13). However, safe removal of partially embedded broncholiths by flexible bronchoscopy had been reported (14).

CONCLUSION:

Bronchopulmonary Lithiasis is a recognized entity, which is usually suspected by the complaints narrated by the patient himself. Based on the patient's history and complaints the disease may be suspected and managed appropriately, thereof. Even a macroscopic examination on a sputum slide could help the clinician. These concretions stain navy blue with Romanowsky dyes.

Conflict of interest: none

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