

Case Report

An Unusual Case of Hemoptysis

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The patient is a 63-year-old with a history of histoplasmosis who has undergone two prior thoracotomies for diagnostic wedge resection revealing granulomatous lesions. She presented with hemoptysis and underwent two embolization procedures providing temporary control of her hemoptysis. Radiologic examinations revealed a large cavitary partially calcified mass in the right lower lobe.

Due to high risk of recurrent bleeding she underwent right lower lobectomy which ultimately revealed an inflammatory, cavitary mass surrounding surgical felt. The material had been placed to buttress a parenchymal suture line and had eroded into the pulmonary parenchyma and hilar vasculature resulting in hemoptysis. Retained surgical material is a rare cause of hemoptysis. We present a case of massive hemoptysis due to retained surgical material resembling a cavitary lesion.

BACKGROUND

Massive hemoptysis is a life-threatening condition. It can cause sudden airway or hemodynamic compromise. Despite adequate treatment, relapses are unpredictable. Localized lesions require pulmonary resections for optimal treatment. Concern for bronchopleural fistulas prompted the use of devices and synthetic materials to avoid this complication. Erosion of foreign materials or retained materials is a known complication in surgical procedures. Retained materials often resemble cavitary lesion or other pulmonary pathology. We present a case of a surgical buttress material presenting as a cavitary lesion eroding into the parenchyma of the lung triggering massive hemoptysis.

CASE PRESENTATION

The patient is a 63-year-old female 25 pk-yr former smoker who had previously undergone bilateral thoracotomies (right 1997; left 2007) for diagnostic wedge resection ultimately demonstrating caseating granulomatous inflammation. She was treated for histoplasmosis after each event although cultures and staining did not reveal fungal organisms. She was subsequently followed with serial imaging due to waxing and waning pulmonary nodules as well as a partially calcified right lower lobe cavitary mass, which demonstrated slow, progressive enlargement over more than 10 years (3 x 3.5 cm in 2004 to 3.7 x 4.3 in 2013).

Due to the increase in size of the nodule she underwent bronchoscopy evaluation including on 6/19/13 including BAL, brushings, and fluoroscopically guided needle aspiration biopsy. There was distortion of the RLL bronchus and complete occlusion of superior segment of right lower lobe (RLL) due to a calcified

lymph node. Final pathologic and microbiologic analysis was completely negative for malignancy or identifiable organisms.

The patient was subsequently admitted to the hospital on 7/16/13 due to an episode of hemoptysis estimated at 300 mL. She was clinically stable and was admitted to the ICU. She subsequently underwent bronchial artery embolization to a hypertrophied RLL bronchial artery, no active extravasation was identified during the procedure. Approximately 24 hours later, the patient had another large volume event, she was intubated for airway protection and transferred to our institution for further evaluation. She was stable upon arrival and underwent emergent pulmonary arteriogram and bronchial arteriogram. There were no pulmonary artery abnormalities identified and no evidence of bronchial artery extravasation. An upper lobe bronchial artery was embolized due to a focal 6 mm hypervascular nodule. The patient was subsequently extubated. Due to the presence of the cavitary lesion and the potential for future, life-threatening events the patient was counseled to undergo urgent right lower lobectomy.

The patient subsequently underwent redo right thoracotomy and right lower lobectomy during the same hospital admission. Intraoperative findings include dense pleural adhesions and multiple calcified, hilar lymph nodes. Following lobectomy, the specimen was incised on the back table to obtain a microbiologic specimen and a 4.5 cm x 2 cm piece of surgical felt was removed from the cavity (Figure 2). The felt was covered with a purulent exudate and appeared to have eroded into the central hilar structures resulting in hemoptysis. Pathologic evaluation of the lung revealed a 4 cm bronchiectatic cavity consisting of a dilated and heavily inflamed bronchus with extensive squamous

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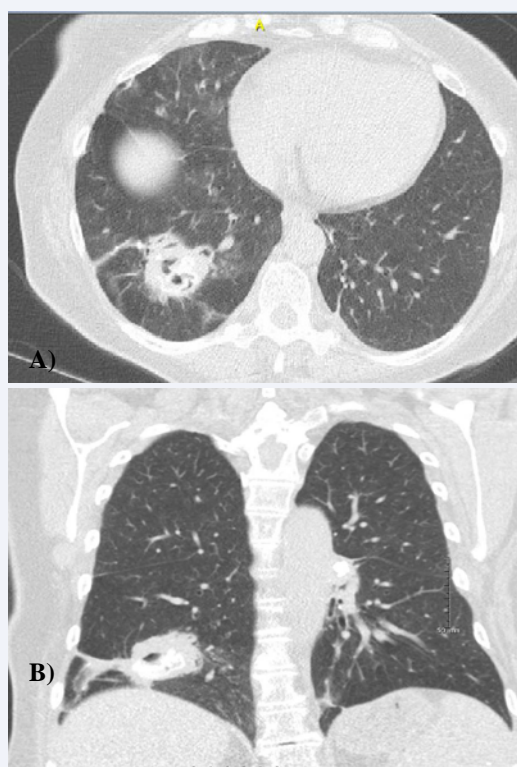


Figure 1 A: CT chest image showing cavitory lesion. B: CT chest image showing cavitory lesion.



Figure 2 Right lower lobe with cavitory lesion and surgical buttress material.

metaplasia and focal ulceration. There was some intraluminal hemorrhage within the cavity, suggesting that this lesion was the source of clinically recognized hemoptysis. The lung parenchyma surrounding the bronchiectatic cavity revealed early organizing pneumonia. There was no evidence of malignancy and the surrounding lymph nodes revealed calcified necrotizing granulomas with fungal stains revealing *Histoplasma* yeast. She had an uneventful post-operative course. Pleural tubes and drains were removed sequentially. She was discharged home on post-operative day #4 in improved condition without further episodes of hemoptysis. Subsequent assessment by the Infectious Disease Service determined no further antifungal therapy was

indicated. To date, the patient has had no further episodes of hemoptysis nor development of new pulmonary nodules.

DISCUSSION

We present the unusual case of eroding surgical buttress material presenting as a cavitory lesion provoking massive hemoptysis. The definition of massive hemoptysis varies widely, a reasonable definition would include < 500 mL in 24 hours or more than 100 mL per hour. Fortunately, in this patient's case, there was no respiratory compromise and we were able to quickly resuscitate her and maintain her hemodynamic stability. Subsequent efforts at bronchial artery embolization were unsuccessful thus surgical resection was undertaken in this patient who had relatively normal preoperative lung function.

Cavitory lesions of the lung include two major categories, infectious and non-infectious. Aspergilloma is a classic cause of massive hemoptysis that can be difficult to treat surgically due to poor underlying pulmonary function associated with cavitory lung disease. Tuberculosis remains a common cause in various regions. Non-infectious causes in adults include bronchogenic carcinoma, traumatic pulmonary pseudocysts, septic emboli, inhaled foreign bodies and connective tissue diseases [1]. Treatment of hemoptysis in association with cavitory lung lesions begins with airway control and hemodynamic stabilization. Bronchoscopy is useful to inspect for clearance of clot from the airways and identification of a central bleeding source such as a central tumor. Bronchoscopy is also useful for selective airway occlusion with a bronchial blocker or double lumen endotracheal tube for acute management and protection of unaffected lung tissue. Arteriography is generally the next step, bronchial artery interrogation is usually performed first and pulmonary arteriography is performed if a source is not identified or there is a high degree of suspicion for pulmonary artery structural pathology.

In this circumstance, arteriography was not successful and the patient was taken for operative resection. Interestingly, we identified surgical felt used as a suture line buttress to be the etiology of the hemoptysis. In hindsight, the material could be visualized in cross section as a serpiginous, radiopaque structure in the RLL cavity on computed tomography (Figures 1A and B). Buttressing of the pulmonary parenchyma or airway stump is a relatively common procedure in pulmonary surgery. Different techniques of reinforcing the bronchial stump to prevent bronchopleural fistula have been described including the use of autologous tissue or prosthetic material. The use of Teflon pledgets has been previously described as has erosion of these pledgets into the bronchus years after resection [2]. A review of the literature reveals several reports of erosion of Teflon pledgets in fundoplication surgery [3], and cardiac surgery [4]. Metalloptysis, or expectoration of stapling material, has been reported following lung surgery for Aspergilloma previously as well [5].

Patients undergoing lung resection are at risk for development of bronchopleural fistula or parenchymal erosions and may be better served with reinforcement of staple lines utilizing autologous tissue such as pericardium, pleura, omentum, or muscle flaps [6]. More recently, absorbable staple line buttress

material has been introduced and offers an additional solution that may prevent long term complications.

CONCLUSIONS

We present an unusual case of hemoptysis due to the erosion of surgical felt, placed as a buttress on a parenchymal suture line, into the pulmonary artery. Absorbable material or autologous tissue is preferable for the reinforcement of suture lines on the pulmonary parenchyma. In patients presenting with hemoptysis and a history of lung surgery, one should consider foreign body erosion once more common etiologies, including malignancy, have been excluded.

CONFLICT OF INTEREST STATEMENT

Alfredo D. Guerron and Daniel P Raymond declare no conflict of interest, and disclose any financial and personal relationships with other people or organizations that could inappropriately influence their work.

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