Massive Hemoptysis from Thoracic Actinomycosis Successfully Treated by Embolization*

Davidson H. Hamer, M.D.;‡ Lee Edward Schwab, M.D.;‡ and Richard Gray, M.D.§

Massive hemoptysis, a rare complication of pulmonary actinomycosis, is generally treated surgically. We describe a patient with massive hemoptysis due to pulmonary actinomycosis who was treated successfully by means of selective bronchial artery embolization. The role of BAE is discussed.

(CHEST 1992; 101:1442-43)

RUL = right upper lobe; AFB = acid-fast bacteria; BAE = bronchial artery embolization

Thoracic actinomycosis is a rare disease with protean manifestations that make it a difficult diagnosis to make clinically. Actinomycosis presenting as a pulmonary mass lesion mimicking bronchogenic carcinoma is well described. Massive hemoptysis due to pulmonary actinomycosis rarely has been reported and has always required surgical intervention.1,2 Our patient had massive hemoptysis from a right upper lobe cavitary mass lesion, found to be pulmonary actinomycosis, and was spared surgery by the use of BAE to control the massive hemoptysis and allow a definite diagnosis to be made by needle aspiration.

Case Report

A 42-year-old woman presented in June 1989 with a one-month history of progressive hemoptysis associated with purulent sputum, right pleuritic pain, dyspnea on exertion, anorexia, and a 12 kg weight loss over two months. Risk factors included a history of alcohol abuse and a 15 pack-year smoking history.

Her temperature was 36.7°C; pulse, 80/min; blood pressure, 100/64; and respiratory rate, 18/min. The patient appeared thin and chronically ill. Examination revealed poor dentition, nontender, mobile cervical adenopathy; diminished breath sounds in the right upper lobe; and tenderness to palpation in the right scapular region. A chest roentgenogram revealed a cavitary RUL lesion and possible hilar adenopathy (Fig. 1). The leukocyte count was 13.4 × 10³/L with 80 percent neutrophils and 6 percent band forms; hemoglobin value was 12.5 g/dL. Coagulation studies were normal. Gram stain of the sputum revealed many leukocytes without a predominant organism; culture yielded normal flora. The PPD was negative.

On the first hospital day, the patient underwent fiberoptic bronchoscopy. The RUL bronchus appeared normal, but bronchial brushing was complicated by 200 ml of brisk bleeding. The AFB, fungal, and routine bacterial cultures of the bronchial washings were negative as was the cytology of the brushings. A chest CT revealed right hilar adenopathy, a 3 cm cavitary RUL mass lesion, and an infiltrate posterior to the lesion. Rib x-ray films showed a scalloped appearance of the fourth right rib suggestive of invasive disease.

*From the Department of Medicine, Section of Pulmonary/Critical Care Medicine, and Department of Radiology, Washington Hospital Center, Washington, DC.
‡Fellow, Infectious Diseases. Presently at New England Medical Center, Boston.
§Director, Medical Intensive Care Unit.
¶Co-Director, Invasive Radiology.
Reprint requests: Dr. Schwab, Washington Hospital Center, 110 Irving Street NW, Washington, DC 20010-2575

Figure 1. Chest roentgenogram (posterior-anterior view) shows a cavitary RUL lesion and possible right hilar adenopathy.

Figure 2. Right supreme intercostal arteriogram prior to Gelfoam embolization shows multiple serpiginous arteries in the high paraspinal region.
The hemoptysis tapered off following bronchoscopy, but an incomplete 24-h sputum collection from the third to the fourth hospital day yielded 500 ml of frank blood mixed with a small amount of malodorous pus. Clindamycin, 600 mg IV q6H, was begun. A bronchial arteriogram with subsequent Gelfoam embolization was performed emergently (Fig 2). Frank hemoptysis stopped immediately, although the patient did continue to produce blood-streaked sputum for the next several days.

Transthoracic fine needle aspiration, performed five days after BAE, yielded purulent fluid which demonstrated sulfur granules on histologic examination. Gram stain revealed many leukocytes, Gram-positive branching filaments, and Gram-positive cocci in pairs (Fig 3). Anaerobic culture of the fluid yielded Actinomyces israelii and a Bacteroides species.

Clindamycin was discontinued; penicillin, 4 million units intravenously every 4 h and metronidazole, 500 mg intravenously every 6 h, were then given for 30 days, followed by an additional four months of penicillin VK, 500 mg orally q6H. The patient's pleuritic pain gradually improved, and there was no recurrence of hemoptysis. A chest roentgenogram taken after five months of antibiotic therapy revealed only residual scarring in the RUL.

DISCUSSION

This report describes a patient with a cavitary pulmonary lesion consisting of Actinomyces israelii and an unidentified Bacteroides species. The presence of sulfur granules on histologic examination and many Gram positive filamentous rods on Gram stain suggest that this was a mixed lung abscess secondary to aspiration with a predominance of A israelii, findings typical of pulmonary actinomycosis. Culture of sputum or bronchoalveolar lavage is inadequate for the diagnosis of pulmonary actinomycosis because actinomyces species may form part of the normal oral flora.16 Open lung or transthoracic thin needle biopsy of a lesion is necessary in order to obtain an uncontaminated sample for histologic or microbiologic identification.

In addition to the difficulties of diagnosing actinomycosis, this case was further complicated by the urgency of life-threatening hemoptysis. Massive hemoptysis, defined as the expectoration of greater than 600 ml of blood in a 48-h period,1 is an extremely rare complication of pulmonary actinomycosis.15 Massive hemoptysis most commonly occurs from bronchogenic carcinoma, tuberculosis, bronchiectasis, lung abscess, and aspergilloma.15 Mortality is high in patients managed conservatively, ranging from 32 to 85 percent.19 Surgical management results in lower mortality rates (0.9 to 18 percent) and a lower likelihood of recurrent hemoptysis.19 Active pulmonary hemorrhage at the time of surgery results in a higher mortality rate.20 Thus, surgery results in lower mortality rates, but optimally, should not be performed while the patient is actively hemorrhaging.

Bronchial artery embolization has been used successfully to control massive hemoptysis of various etiologies including lung abscess.11,12 This technique may be used to control bleeding prior to surgery and to allow time to perform preoperative pulmonary function testing, thereby decreasing the mortality risk.11 Bronchial artery embolization may also be applied to patients unable to undergo surgery, ie, those with unresectable lung cancer, or poor pulmonary function.12

Bronchial artery embolization was utilized successfully in our patient to both control her massive hemoptysis and to allow a definitive diagnosis of the mass lesion by needle aspiration. When the diagnosis of thoracic actinomycosis was established and malignancy ruled out, the patient underwent successful treatment with long-term penicillin. Thus, the use of BAE in this patient spared her the morbidity and potential mortality of a lobectomy. Previously reported cases of pulmonary actinomycosis complicated by massive hemoptysis were all treated and diagnosed surgically.19 We conclude that BAE is useful in selected patients to both treat massive hemoptysis and enable the diagnosis of its cause.

REFERENCES

5 Old L, Stokes TL. Shock from massive hemoptysis due to pulmonary actinomycosis in child. Virg Med Month 1972; 99:142-47
6 Bennhoff DF. Actinomycosis: diagnostic and therapeutic considerations and a review of 32 cases. Laryngoscope 1984; 94:1198-1217