

## Cast of the left bronchial tree

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### ABSTRACT

A 59-year old woman presented with hemoptysis of thick blood clots and fever of two days duration. Her medical history included sarcoidosis for which she was on chronic steroids. Computed tomography imaging revealed stage IV sarcoidosis with diffuse cystic and fibrotic changes bilaterally, worse in the right lung. She underwent bronchoscopy to attempt to localize a source but none was clearly found; no biopsies were performed. Immediately post-procedure she developed massive hemoptysis with hypoxia leading to cardiopulmonary arrest. She was intubated and stabilized with the spontaneous cessation of her bleeding. Immediate angiography revealed no active extravasation, but localized embolization was performed on the right main and right accessory bronchial arteries because these appeared hypertrophied and irregular. Two days later, she again developed spontaneous massive hemoptysis leading to cardiopulmonary arrest. Manual ventilation through the endotracheal tube became impossible. Immediate bronchoscopy identified a blood clot extending from the main carina into the left main stem bronchus. This was removed with a cryoprobe and ventilation could then be achieved easily. Examination of the blood clot demonstrated it to be a cast of the proximal left bronchial tree. Despite the return of spontaneous circulation via resuscitative efforts, the patient developed acute respiratory distress syndrome and later expired.

### ARTICLE HISTORY

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### KEYWORDS

Hemoptysis; blood cast;  
bronchial tree;  
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## 1. Case

A 59-year-old woman was admitted with hemoptysis of thick blood clots and fever of two days duration. Her medical history included sarcoidosis and partial right upper lobectomy 24 years earlier for unclear reasons. She was maintained on low dose prednisone as an outpatient.

Computed tomography (CT) scan of the chest with contrast revealed stage IV sarcoidosis with diffuse cystic and fibrotic changes bilaterally, more prominent in the right lung, as well as possible superimposed acute pneumonia. She was started on antibiotic therapy. The following day, she underwent bronchoscopy which showed no endobronchial lesions, nor evidence of active bleeding or residual blood. However, immediately post-procedure, she developed profuse large-volume hemoptysis with worsening hypoxia ultimately leading to cardiopulmonary arrest with pulseless electrical activity.

She was intubated and immediate resuscitative efforts were able to achieve the return of spontaneous circulation. After stabilization, she underwent angiography which did not identify any active extravasation but embolization was performed of the main right and accessory right bronchial arteries as these appeared hypertrophied and irregular. Two days later, she again



developed spontaneous massive hemoptysis with hypoxia and cardiopulmonary arrest. Ventilation became impossible, with significant resistance even with manual bagging through the endotracheal tube. She underwent emergent bedside bronchoscopy with visualization of a large blood clot extending from the left main stem bronchus into the trachea. This was removed bronchoscopically with a cryoprobe, showing a cast of the proximal left bronchial tree (Figure 1). She was then able to be ventilated easily.

Her hospital course was complicated by acute respiratory distress syndrome from massive aspiration of blood and she later passed away.

## 2. Discussion

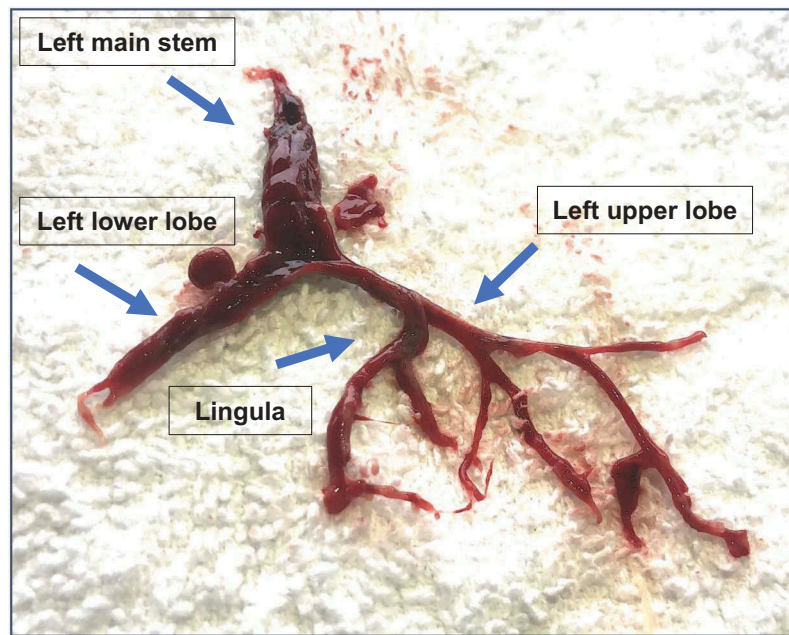
Massive hemoptysis is described as a rapid rate of bleeding or a large amount of expectorated blood associated with a serious risk of mortality [1]. The clinical consequences of hemoptysis include aspiration of blood to the contralateral lung, airway obstruction, blood transfusion, hypoxemia requiring mechanical ventilation and death [2,3].

The initial approach to massive hemoptysis includes identifying the laterality of the source of bleeding by history (e.g., recent biopsy) or imaging. Initial protection

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**Figure 1.** Blood cast of the proximal left bronchial tree including the left main stem bronchus, left lower lobe bronchus as well as left upper lobe and lingular bronchi and segmental bronchi.

of the non-bleeding lung is accomplished by turning the patient to the lateral decubitus position with the bleeding side down. A definitive airway often needs to be established (i.e., with a single lumen endotracheal tube) to help with oxygenation and ventilation and to facilitate fiberoptic bronchoscopy [4,5].

The bronchoscopic management of hemoptysis includes clearing the airways of blood to maintain adequate ventilation and placement of an endobronchial blocker to isolate the bleeding lung until a more definitive intervention can take place [6]. For proximal airway bleeding, thermal ablative techniques and other local therapies can be used. Peripheral bleeding that cannot be reached bronchoscopically often requires angiographic embolization [7].

#### Disclosure statement

No potential conflict of interest was reported by the authors.

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