

Case Report

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TANAFFOS 

A 58-Year-Old Woman with Recurrent Hemoptysis after Successful Bronchial Artery Embolization

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Massive hemoptysis is a life-threatening complication of respiratory disease. It is an emergency requiring immediate medical attention. A 58 year-old woman with bronchiectasis was admitted to the hospital following episodes of massive hemoptysis. Chest CT scan and bronchoscopy did not reveal any endobronchial lesion and bronchial artery angiography and embolization were performed successfully. Despite successful embolization, her hemoptysis recurred and the patient underwent angiography for the 2nd time; which showed normal left bronchial artery and occluded right intercostobronchial artery. Lower thoracic aortogram revealed a systemic non-bronchial artery in the right lower lung field and evidence of pulmonary shunting. Super-selective angiogram of this artery showed vascularity to lower esophagus and considerable supply of the right lower lung field with pulmonary vascular shunting. Embolization of this non-bronchial systemic artery was carried out successfully with complete occlusion. Few days after the embolization, the patient reported pleuritic and epigastric pain and also complained of odynophagia and dysphagia; which were managed conservatively. Four days later, her symptoms improved and she was discharged subsequently. At 40-day follow up, she was still symptom-free with no hemoptysis.

Key words: Hemoptysis, Bronchial artery, Embolization

INTRODUCTION

Massive hemoptysis is defined as expectoration of large amounts of blood (100 – 600 cc) via the respiratory tract and is one of the most common life-threatening respiratory emergencies. Massive hemoptysis has a variety of underlying etiologies such as bronchiectasis, tuberculosis, AVM and malignancy and source of bleeding in 90% of patients is the bronchial circulation. Diagnostic tests for hemoptysis include chest radiography, chest CT scan, and bronchoscopy. Some researchers suggest taking a chest CT scan prior to bronchoscopy for evaluation of the etiology and localization of bleeding in such cases (1). A non-surgical safe method for treatment of patients with hemoptysis is bronchial artery embolization (BAE). BAE was first introduced in 1973 by Remy et al (2). Typically,

hemoptysis resolves after bronchial artery embolization. Recurrence of hemoptysis after a successful BAE suggests that the source of bleeding may be from the pulmonary or systemic non-bronchial artery.

Anatomy of the bronchial artery

Normal bronchial arteries are small vessels that originate directly from the descending thoracic aorta and supply blood to the lungs, esophagus and lymph nodes. Bronchial arteries show substantial anatomical variations. The majority of these variations are shown in Figure 1.

In a minority of cases, the origin of bronchial arteries is outside the level of the fourth or the sixth thoracic vertebra in the descending aorta or is at the aortic arch or any aortic

collateral vessel, with an intrapulmonary course along the major bronchi, called ectopic bronchial arteries.

Systemic non-bronchial arteries can also be the source of hemoptysis or its early recurrence. These arteries have a trans-pleural course.

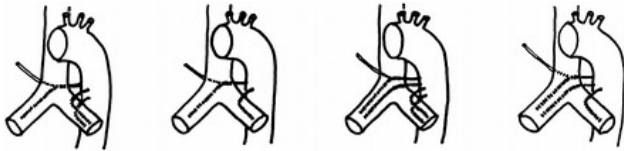


Figure 1. The types of bronchial arterial supply: Type I: two bronchial arteries on the left and one on the right that manifests as an ICBT (40.6% of cases); Type II: one on the left and one ICBT on the right (21.3%); Type III: two on the left and two on the right (one ICBT and one bronchial artery) (20.6%); and Type IV: one on the left and two on the right (one ICBT and one bronchial artery) (9.7%). (1)

Complications: BAE is a safe method, but has several reported complications. The most common complication is the transient chest pain (24-91%) (3-4) due to ischemia caused by embolization. Occlusion of vasa vasorum can cause subintimal dissection of the aorta or the bronchial artery, but it is usually asymptomatic and insignificant (5). Embolization of esophageal branches may be complicated with temporary dysphagia (0.7-18.2%)(3-4). Another complication is pulmonary infarction, especially when the bronchial artery is the only source of blood supply to the lung parenchyma with low pulmonary artery perfusion due to proximal pulmonary artery occlusion (5).

CASE SUMMARY

A 58 year-old woman was admitted because of recurrent sub-massive hemoptysis since a month ago. She was complaining of chronic cough and was diagnosed as having right upper lobe bronchiectasis. She was a non-smoker but had been exposed to wood smoke because of home baking. She was suffering from diabetes for the past two years. Four months before the admission, the patient experienced some episodes of massive hemoptysis. Computed tomographic scans of the chest with intravenous contrast showed bronchiectasis at the posterior segment of the upper lobe. Bronchoscopy did not show any endobronchial lesion, and bronchoalveolar

lavage was negative for acid-fast bacilli and malignant lesions.

The patient was referred to an interventionist who ordered a thoracic aortogram with the intention of transcatheter embolization.

A flash thoracic aortogram showed a tortuous right intercostobrachial artery. Selective angiogram of this artery with Cobra 5F catheter showed evidence of contrast extravasation and pulmonary shunting. A micro catheter (Miraflex, Cook) was introduced co-axillary through 5F Cobra catheter and embolization was performed with PVA 500 - 710 μ successfully. An angiographic run after embolization of the right intercostobronchial artery showed complete obliteration of the right intercostobronchial artery (Figures 2 and 3).

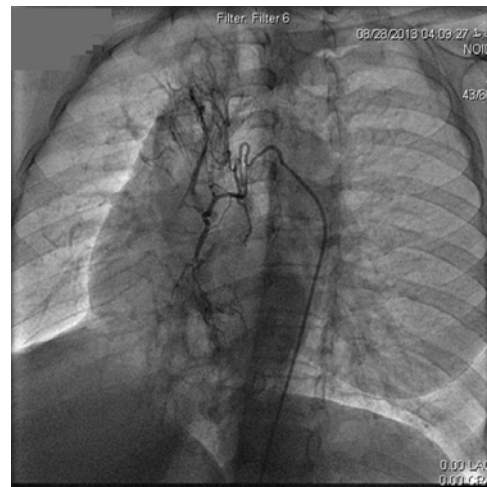


Figure 2. Right intercostobronchial artery before embolization.

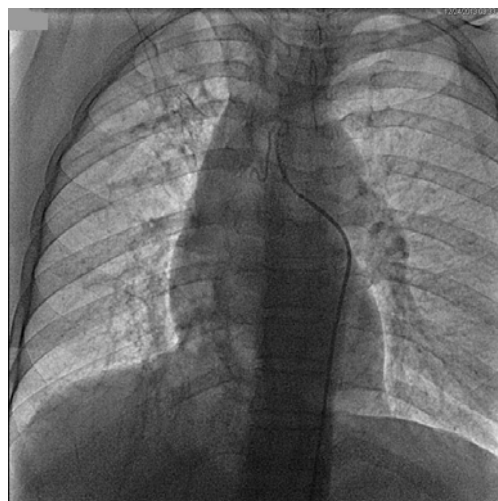


Figure 3. Right intercostobronchial artery after embolization.

Four months later, she was admitted again because of recurrent sub-massive hemoptysis. On admission, she had normal vital signs and the percutaneous oxygen saturation was 95% at room air. Physical examination was normal except for scattered wheezes on the lung auscultation. Repeated bronchial angiography showed normal bronchial artery and occluded right intercostobronchial artery. The right subclavian angiogram showed no evidence of lung supply by the internal mammary artery or other branches of this artery but lower thoracic aortogram revealed a systemic non-bronchial artery in the right lower lung and evidence of pulmonary shunting. Super-selective angiogram of this artery showed vascular distribution to lower esophagus and considerable supply of the right lower lung with pulmonary vascular shunting. Embolization of this non-bronchial systemic artery was performed with PVA 250 - 300 μ successfully with complete occlusion (Figures 4 and 5).

In the face of a lot of vascular networks that supply the esophagus, we were not concerned about a major complication.

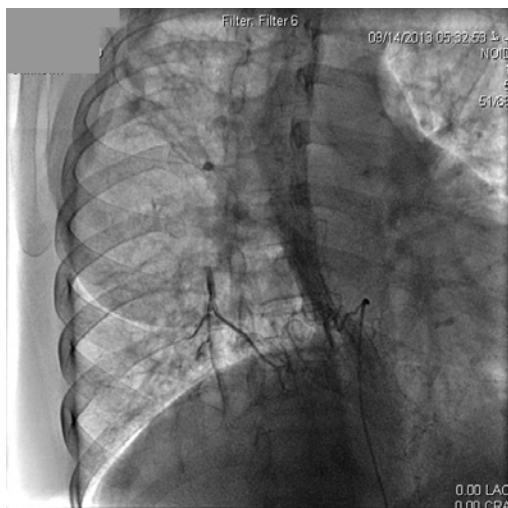


Figure 4. Non-bronchial artery before embolization.

The day after the embolization, she complained of right-sided pleuritic chest pain. On the second post-embolization day, the patient developed epigastric pain, odynophagia and dysphagia. A chest x ray was obtained

providing no new findings. The laboratory tests were normal. The symptoms were managed conservatively and gradually abated. Four days later, she was discharged. At 40-day follow up, she was still symptom-free.



Figure 5. Non-bronchial artery after embolization.

CONCLUSION

Bronchial artery embolization serves both as the first-line therapy for massive hemoptysis and also as a bridge to more definitive therapies targeted at the underlying etiology. Bronchial artery embolization has a high rate of immediate clinical success coupled with a low complication rate.

It can be repeatedly performed in case of hemoptysis recurrence and the associated angiography can elucidate alternative sources of hemoptysis such as non-bronchial systemic and pulmonary arteries.

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