

## Spontaneous Hemomediastinum and Hemothorax Caused by a Ruptured Bronchial Artery Aneurysm

Yeon-Ho Seo, M.D.\*, Jin Young Kwak, M.D.\*\*

A bronchial artery aneurysm (BAA) is uncommon and usually associated with chronic inflammatory lung disease or a systemic vascular condition, which is rarely the etiology of mediastinal hemorrhage. A middle-aged person presented with spontaneous hemothorax and hemomediastinum. A diagnostic evaluation identified a bronchial artery aneurysm as the source. To prevent further rupture, we performed a bronchial artery embolization. In the absence of trauma or other causes for hemothorax and mediastinal hemorrhage, the possibility of a BAA should be considered. A bronchial artery aneurysm can be managed by interventional techniques as well as surgery.

Key words: 1. Mediastinum  
2. Vascular disease  
3. Hemorrhage  
4. Bronchial arteries  
5. Aneurysm

### CASE REPORT

A 41-year-old man was admitted to the emergency room due to a sudden onset of chest pain radiating to the back and dyspnea. Upon reaching the hospital, the patient was in hemodynamically stable condition except for mild elevation of his respiration rate; his blood pressure was 130/90 mmHg, pulse rate was 84 beats/min, and the rhythm was regular. An EKG presented a normal sinus rhythm without any ischemic signs or arrhythmia. Breath sounds decreased over the left hemithorax. Laboratory examination revealed hemoglobin of 12.2 g/dL. There was no trauma, no sign of infection, and no hemoptysis. His history included an episode of pulmonary tuberculosis 20 years earlier. A chest X-ray (Fig. 1) showed widening of the mediastinum and left side pleural effusion. A

chest computed tomographic (CT) scan (Fig. 1) confirmed the left hemothorax and posterior mediastinum hematoma. A chest tube was inserted to left pleural cavity. Because of a suspicious origin of mediastinal hemorrhage on the chest CT scan, a thoracic aortogram and bronchial arteriogram were conducted. On the selective bronchial arteriogram, a moderately sized bronchial artery aneurysm was found that was contiguous with abnormal small collateral arteries (Fig. 2). There were no signs of active bleeding or extravasation. To prevent the further rupture or extravasation of the aneurysm and its collaterals, we performed a bronchial artery embolization. The patient had a stable condition during percutaneous vascular intervention. He was sent to the ICU for close observation after the embolization.

The remaining course was uneventful; the chest tube was

\*Department of Thoracic and Cardiovascular Surgery, Presbyterian Medical Center

\*\*Department of Internal Medicine, Presbyterian Medical Center

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Corresponding author: Yeon-Ho Seo, Department of Thoracic and Cardiovascular Surgery, Presbyterian Medical Center, Junghwasan-dong 1-ga, Wansan-gu, Jeonju 560-750, Korea

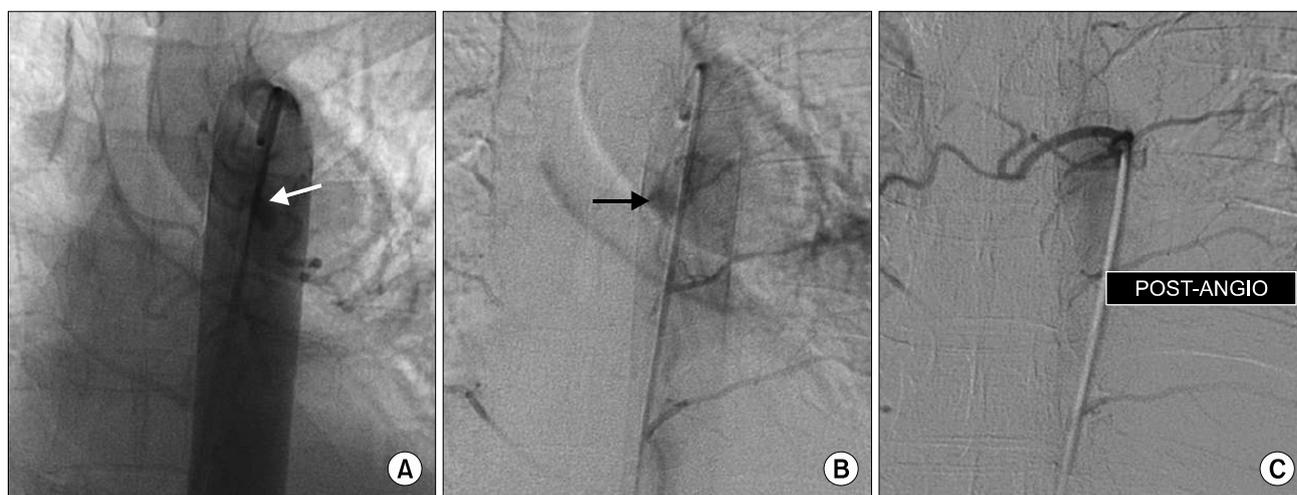
(Tel) 82-63-230-8795 (Fax) 82-63-230-8659 (E-mail) scsmd11@gmail.com

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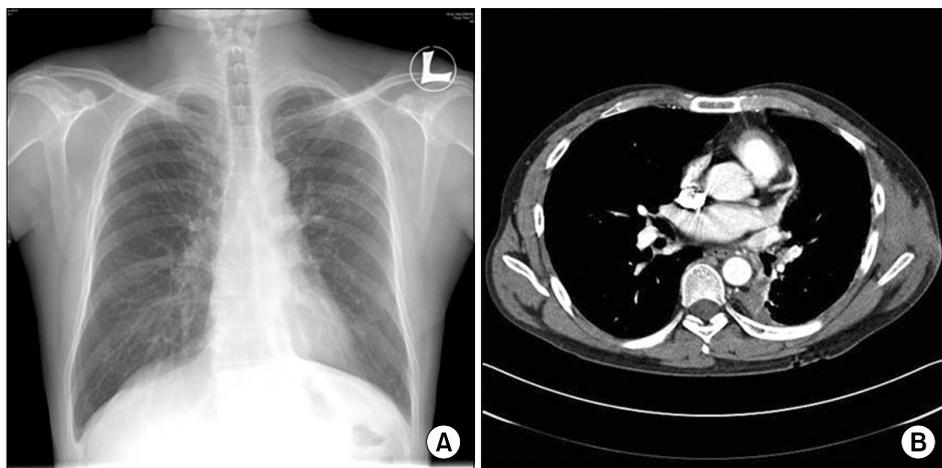
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**Fig. 1.** A chest X-ray (A) shows widening of the mediastinum and left side pleural effusion. A chest computed tomographic scan (B) confirms the left hemothorax and posterior mediastinum hematoma.



**Fig. 2.** A selective bronchial arteriogram shows a moderately sized bronchial artery aneurysm (BAA) with abnormal small collateral arteries (A, B). After bronchial artery embolization (C), the BAA and small collaterals disappeared.



**Fig. 3.** The day before discharge. A chest X-ray (A) and chest CT scan (B) show no pleural effusion or hematoma of the mediastinum.

removed on day 7, and he left the hospital on day 15. The day before discharge, a chest CT scan showed no more hematoma of the mediastinum or hemothorax (Fig. 3).

## DISCUSSION

Acute hemomediastinum and hemothorax are usually related to chest trauma, rupture of a thoracic aorta, aorta or vertebral artery dissection, or a tumor. They may also follow surgery or angiography or be drug induced [1,2]. In addition, nontraumatic spontaneous rupture of the thoracic aorta without aneurysm or dissection is an extremely rare cause [3]. A ruptured bronchial artery aneurysm (BAA) is rarely the etiology of mediastinal hemorrhage. BAA is a rare entity that is observed in less than 1% of all cases of selective bronchial arteriography [4]. The causes of spontaneous mediastinal hemorrhage have been classified into three circumstances: (1) hemomediastinum secondary to abnormal clotting or fibrinolysis associated with hemodialysis, anticoagulant or fibrinolytic therapy, or hemophilia; (2) hemomediastinum secondary to hemorrhage into mediastinal glands, cysts, or tumors; and (3) "idiopathic" hemomediastinum occurring after a sudden increase in intrathoracic pressure, during coughing, sneezing or vomiting, or sudden sustained hypertension [5].

Most cases of nontraumatic mediastinal hemorrhage are revealed by chest pain or dyspnea, and hemorrhagic shock is rare. Massive hemomediastinum is less common and hemothorax is the least common mode of presentation in BAA patients. BAA may present as an asymptomatic mass, but it is more commonly diagnosed after complications occur. Not uncommonly, patients have a history of chronic inflammatory disease, ranging from arteritis to chronic bronchitis. This suggests that the etiology may be chronic inflammation surrounding, or directly involving, the artery [6,7]. In this case, the patient had a history of pulmonary tuberculosis 20 years earlier.

Bronchial artery aneurysms are typically classified anatomically, either as mediastinal or intrapulmonary, because of their different associated clinical symptoms. Intrapulmonary aneurysms often present with massive or intermittent hemoptysis. Although mediastinal aneurysms may manifest as a mediastinal mass, acute superior vena cava obstruction, dys-

phagia, hemothorax, hemomediastinum, and hematemesis can occur [6]. The primary diagnostic modes are computed tomographic angiography, intra-arterial angiography and, occasionally, magnetic resonance imaging in confusing cases [8]. In patients with symptoms of chest pain, mediastinal hemorrhage, and hemothorax, enhanced CT should be performed to detect the bleeding point before treatment. In a hemodynamically stable patient like our case, the diagnosis must be confirmed more definitely by selective bronchial arteriography, which enables concurrent therapeutic embolization [4].

Surgery may be required for assessment or treatment of mediastinal compression and/or life-threatening bleeding [1]. Surgical procedures such as resection or ligation of the aneurysm have been associated with high morbidity and mortality. Until the past decade, bronchial artery aneurysms were treated surgically.

Since then, endovascular techniques such as transcatheter embolization have been increasingly applied. Collateral vessels, incomplete embolization, and arterial re-canalization may cause a recurrent aneurysm; this accounts for the reported unfavorable long-term recurrence rates [6]. However, a follow-up angiogram is not always required unless recurrent bleeding occurs.

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