

Answer

Pulmonary Artery Pseudoaneurysm

Pulmonary artery pseudoaneurysm is a rare complication that often presents with hemoptysis.^{1,2} The etiology of pulmonary artery pseudoaneurysm are varied. Infectious causes include bacterial pneumonia,² tuberculosis (Rasmussen aneurysm),³ and mucormycosis.⁴ Inflammatory diseases, such as Behçet disease, are known to cause pulmonary artery pseudoaneurysms.^{5,6} They may also arise after blunt or penetrating trauma.^{7,8} Pulmonary artery pseudoaneurysms have also been attributed to malignancies, such as lung carcinoma,⁹ sarcoma,¹⁰ and bullous emphysema.¹¹ Iatrogenic causes include bronchial artery angiography¹² and pulmonary artery catheterization,^{13,14} radiofrequency ablation,¹⁵ lung resection,¹⁶ and pneumonectomy.¹⁷ To our knowledge, this is the first case of pulmonary artery pseudoaneurysm reported after VATS.

The diagnosis of pulmonary artery pseudoaneurysms has been simplified with improved computed tomographic angiography, but subselective angiography of the segmental pulmonary arteries provides more detailed anatomical information and potential treatment (**Figure 2A**).¹⁸ Although historically the treatment of pulmonary artery pseudoaneurysms required surgical repair, percutaneous techniques, such as transcatheter coil embolization^{19,20} (Figure 2B) and stent grafting²¹ of the main pulmonary arteries, have become the first-line treatment modality.

Accepted for Publication: October 11, 2010.

Correspondence: Stephen J. Huddleston, MD, PhD, Department of Surgery, The Johns Hopkins Hospital, 600 N Wolfe St, Blalock Bldg, Room 618, Baltimore, MD 21287 (shuddleston@jhmi.edu).

Author Contributions: Study concept and design: Huddleston, Wei Lum, Black, and Meneshian. Acquisition of

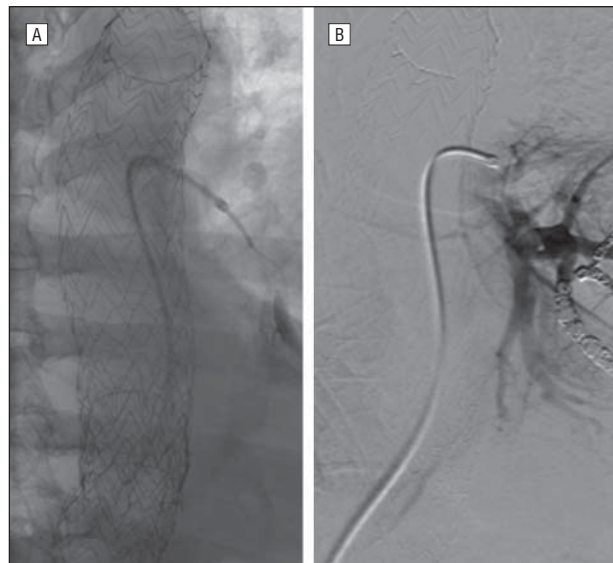


Figure 2. Subselective angiography demonstrated a pulmonary artery pseudoaneurysm arising from the superior segmental artery of the descending pulmonary artery (A) with successful coil embolization (B) demonstrating absence of contrast-enhanced blood flow in the pseudoaneurysm.

data: Huddleston, Wei Lum, Black, and Meneshian. Analysis and interpretation of data: Huddleston, Wei Lum, Black, and Meneshian. Drafting of the manuscript: Huddleston. Critical revision of the manuscript for important intellectual content: Huddleston, Wei Lum, and Black. Administrative, technical, and material support: Huddleston. Study supervision: Wei Lum, Black, and Meneshian. Financial Disclosure: None reported.

REFERENCES

1. Yellin LB, Filler JJ, Barnette RE. Nominal hemoptysis heralds pseudoaneurysm induced by a pulmonary artery catheter. *Anesthesiology*. 1991;74(2):370-373.
2. Kalina M, Giberson F. Hemoptysis secondary to pulmonary artery pseudoaneurysm after necrotizing pneumonia. *Ann Thorac Surg*. 2007;84(4):1386-1387.
3. Keeling AN, Costello R, Lee MJ. Rasmussen's aneurysm: a forgotten entity? *Cardiovasc Intervent Radiol*. 2008;31(1):196-200.
4. Coffey MJ, Fantone J III, Stirling MC, Lynch JP III. Pseudoaneurysm of pulmonary artery in mucormycosis: radiographic characteristics and management. *Am Rev Respir Dis*. 1992;145(6):1487-1490.
5. Kojuri J, Aslani A, Shahzad S. A large pulmonary artery pseudoaneurysm in a patient with Behçet's disease. *J Cardiovasc Med (Hagerstown)*. 2007;8(12):1073-1075.
6. Yoon YH, Kim KH, Baek WK, et al. Pulmonary artery pseudoaneurysm in a patient with Behçet disease. *J Thorac Cardiovasc Surg*. 2004;127(2):590-592.
7. Rai VK, Malireddy K, Dearmond D, Myers J, Dent DL. Traumatic pseudoaneurysm of the pulmonary artery. *J Trauma*. 2010;69(3):730.
8. deJonge I, Vahl A, van der Hulst V. Coil embolization of a left pulmonary artery pseudoaneurysm after penetrating injury. *J Endovasc Ther*. 2003;10(3):681-683.
9. Camargo Jde J, Camargo SM, Machuca TN, Bello RM. Large pulmonary artery pseudoaneurysm due to lung carcinoma: pulmonary artery pseudoaneurysm. *J Thorac Imaging*. 2010;25(1):W4-W5.
10. Koch A, Mechttersheimer G, Tochtermann U, Karck M. Ruptured pseudoaneurysm of the pulmonary artery—rare manifestation of a primary pulmonary artery sarcoma. *Interact Cardiovasc Thorac Surg*. 2010;10(1):120-121.
11. Bowler RP, Durham J, Schwarz MI. Massive hemoptysis from a pulmonary artery aneurysm associated with an emphysematous bulla. *Chest*. 1998;113(4):1130-1131.
12. Sbrano H, Mitchell AW, Ind PW, Jackson JE. Peripheral pulmonary artery pseudoaneurysms and massive hemoptysis. *AJR Am J Roentgenol*. 2005;184(4):1253-1259.
13. Poplausky MR, Rozenblit G, Rundback JH, Crea G, Maddineni S, Leonardo R. Swan-Ganz catheter-induced pulmonary artery pseudoaneurysm formation. *Chest*. 2001;120(6):2105-2111.
14. Feng WC, Singh AK, Drew T, Donat W. Swan-Ganz catheter-induced massive hemoptysis and pulmonary artery false aneurysm. *Ann Thorac Surg*. 1990;50(4):644-646.
15. Sakurai J, Mimura H, Gobara H, Hiraki T, Kanazawa S. Pulmonary artery pseudoaneurysm related to radiofrequency ablation of lung tumor. *Cardiovasc Intervent Radiol*. 2010;33(2):413-416.
16. Matsumura Y, Shiono S, Saito K, Sato T. Pulmonary artery pseudoaneurysm after lung resection successfully treated by coil embolization. *Interact Cardiovasc Thorac Surg*. 2010;11(3):364-365.
17. Graham AJ. False aneurysm of the pulmonary artery after pneumonectomy. *Guys Hosp Rep*. 1952;101(3):229-232.
18. Shin TB, Yoon SK, Lee KN, et al. The role of pulmonary CT angiography and selective pulmonary angiography in endovascular management of pulmonary artery pseudoaneurysms associated with infectious lung diseases. *J Vasc Interv Radiol*. 2007;18(7):882-887.
19. Block M, Lefkowitz T, Ravenel J, Leon S, Hannegan C. Endovascular coil embolization for acute management of traumatic pulmonary artery pseudoaneurysm. *J Thorac Cardiovasc Surg*. 2004;128(5):784-785.
20. Sridhar SK, Sadler D, McFadden SD, Ball CG, Kirkpatrick AW. Percutaneous embolization of an angiographically inaccessible pulmonary artery pseudoaneurysm after blunt chest trauma: a case report and review of the literature. *J Trauma*. 2010;69(3):729.
21. Park A, Cwikiel W. Endovascular treatment of a pulmonary artery pseudoaneurysm with a stent graft: report of two cases. *Acta Radiol*. 2007;48(1):45-47.