

Spontaneous Pulmonary Torsion Secondary to Left Upper Lobe Malignancy

Marshall T. Bell, MD,* Daniel A. Kelmenson, MD,‡ Daniel Vargas, MD,§ and Robert A. Meguid, MD, MPH*

CASE REPORT

A 72-year-old man with known left upper lobe moderately differentiated mucinous adenocarcinoma presented with shortness of breath 3 weeks after diagnosis, during ongoing work-up. Work-up to date demonstrated no evidence of metastatic disease. He was presumed to have postobstructive pneumonia and antibiotics started. Prior imaging was suspicious for pericardial invasion, so dedicated gated cardiac magnetic resonance imaging was performed. This demonstrated findings suggestive of

pulmonary torsion (Fig. 1). Chest computed tomography was performed immediately thereafter and confirmed 180° torsion of the left upper lobe (Fig. 2).

The patient was emergently taken for thoracic exploration. Obstruction of the left mainstem bronchus due to rotation was demonstrated upon flexible bronchoscopy. Upon entering the left hemi-thorax via thoracotomy, a 180° counterclockwise axial rotation of the lung around the hilum was identified. Anatomy was notable for the upper lobe being distended and

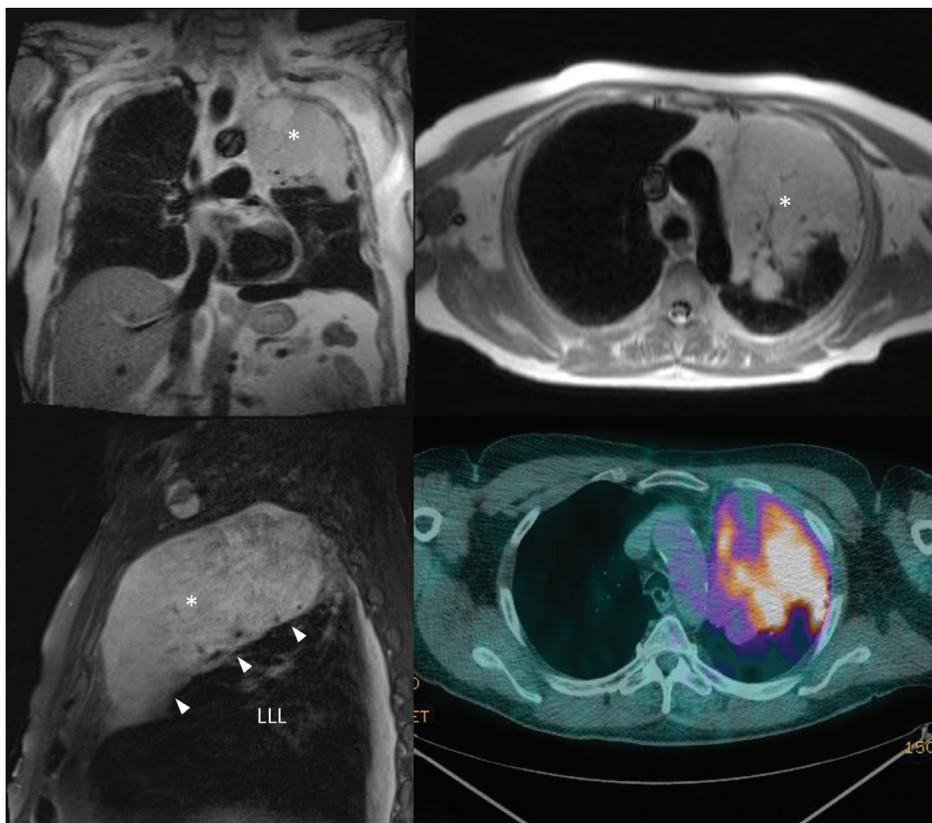


FIGURE 1. Coronal (*top left*) and transaxial (*top right*) HASTE MR images of the chest demonstrating a large mass (*) near completely occupying the entirety of the left upper lobe. Sagittal T2 weighted fast-spin echo MR image (*bottom left*) shows a diffusely high intensity signal mass (*) throughout the left upper lobe. Note the left major fissure (*arrowheads*) delineating the boundary with the LLL. Whole body positron emission tomography-computed tomography image (*bottom right*) obtained 1 day before the thoracic MRI demonstrates the high and heterogeneous FDG avidity of this neoplasm. HASTE, Half Fourier Acquisition Single Shot Turbo Spin Echo; LLL, left lower lobe; MR, magnetic resonance.

*Division of Cardiothoracic Surgery, Department of Surgery, ‡Division of Pulmonary Sciences and Critical Care Medicine, Department of Medicine, and §Department of Radiology, University of Colorado, Denver, Colorado.

Disclosure: The authors declare no conflict of interest.

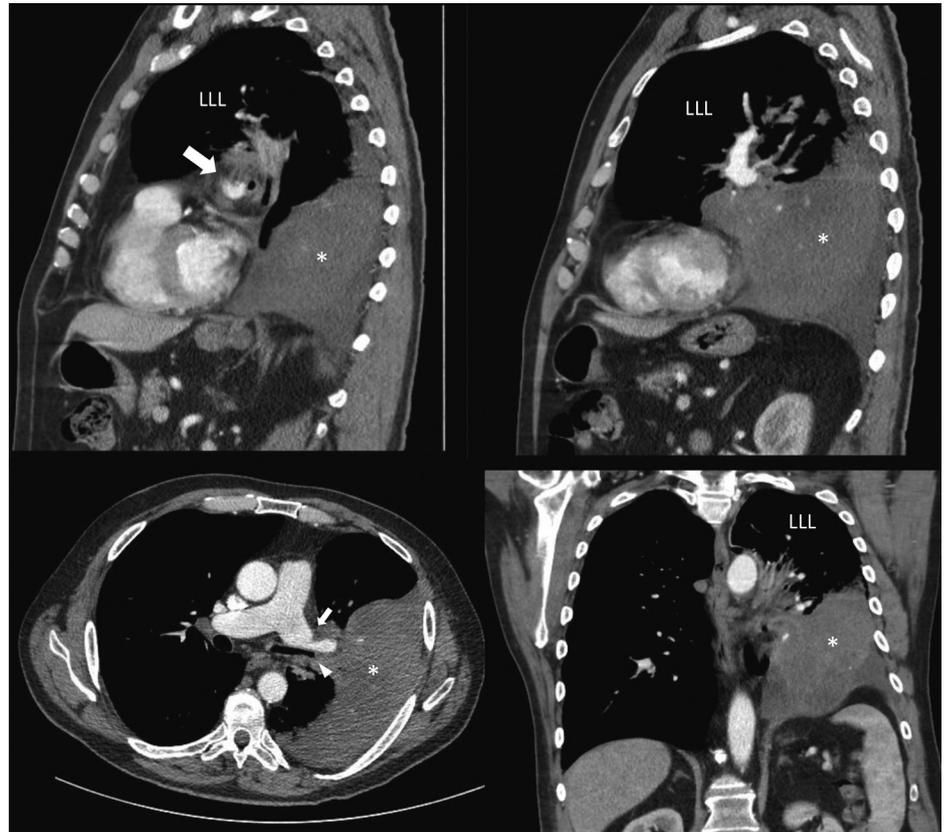
Address for correspondence: Marshall T. Bell, MD, Division of Cardiothoracic Surgery, University of Colorado School of Medicine, 12631 East 17th Avenue, Mail Stop C310, Room 6601, Aurora, CO 80045. E-mail: Marshall.bell@ucdenver.edu

DOI: 10.1097/JTO.0000000000000573

Copyright © 2015 by the International Association for the Study of Lung Cancer

ISSN: 1556-0864/15/1011-1653

FIGURE 2. Sagittal (top left and right), transaxial (bottom left), and coronal (bottom right) contrast-enhanced CT images of the chest obtained 3 days after the thoracic MRI demonstrate shift in location of the patient's mass which now occupies the expected location of the LLL (*). The left lower lobe is now located anterior and superior to this mass (LLL). Note the swirling of the left hilar structures (top left image: arrow). Also note the kinking of the torsed left pulmonary artery on the transaxial plane (bottom left image: arrow). Posterior to this, the left mainstem bronchus appears near completely obliterated (arrowhead). In addition, the pulmonary veins are obliterated and not visualized. CT, computed tomography; MRI, magnetic resonance imaging; LLL, left lower lobe.



heavy, the lower lobe being air filled and light, an effusion was present, and the inferior pulmonary ligament was long and narrow. However, the pulmonary veins were not completely obstructed. The torsion was reduced and the lung viability and the extent of disease assessed. The lung parenchyma appeared viable and the tumor did not grossly invade the chest wall or pericardium. Unfortunately, the tumor crossed the oblique fissure invading the lower lobe and abutting the continuation pulmonary artery. We performed a left pneumonectomy with mediastinal lymph node dissection. Following closure of the chest, the patient was oxygenating adequately and hemodynamically stable thus we proceeded with staging mediastinoscopy to provide as much diagnostic/prognostic information as possible. The patient was extubated at completion of the operation. He was given a strict regimen for appropriate postoperative fluid management, pulmonary toilet and pain control and recovered in a timely and uncomplicated fashion.

COMMENTS

Pulmonary torsion is a life-threatening entity describing the axial rotation of lung parenchyma around the bronchovascular axis resulting in airway and vascular compromise. While typically seen after thoracic interventions,^{1,2} torsion can occur in

the setting of intrathoracic pathologies, such as masses, pleural effusions,³ and pneumothoraces.⁴ Malignancies occurring in the hilum may cause postobstructive atelectasis, pneumonia, or sympathetic effusions. In addition, mucin-producing variants can produce significant lobar distension and in this case resulted in spontaneous whole lung torsion. While the emergent pneumonectomy represent a particularly morbid procedure,⁵ the prompt diagnosis and exploration in the present case resulted in the patient receiving a safe and oncologically appropriate operation.

REFERENCES

1. Nguyen JC, Maloney J, Kanne JP. Bilateral whole-lung torsion after bilateral lung transplantation. *J Thorac Imaging* 2011;26:W17–W19.
2. Khalil MW, de Hoest M, Loubani M. Right upper lobe torsion following middle lobectomy: A rare complication. *Asian Cardiovasc Thorac Ann* 2013;21:739–740.
3. Irie M, Okumura N, Nakano J, et al. Spontaneous whole-lung torsion after massive pleural effusion and atelectasis. *Ann Thorac Surg* 2014;97:329–332.
4. Mathew R, Maraju RS. Pneumothorax with torsion of the right upper lobe. *Emerg Med J* 2008;25:538.
5. Klapper J, Hirji S, Hartwig MG, et al. Outcomes after pneumonectomy for benign disease: The impact of urgent resection. *J Am Coll Surg* 2014;219:518–524.