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Caught in the Act: Paradoxical Emboli

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A 29-year-old woman who had factor V Leiden thrombophilia and an indwelling venous catheter for chronic pain therapy presented with dyspnea, fever, and abdominal pain. Computed tomography revealed septic pulmonary emboli with surrounding consolidation and thrombus extending from the superior vena cava to the right atrium (Fig. 1), as well as wedge-shaped splenic infarcts (Fig. 2). Blood cultures grew *Staphylococcus aureus*. A transesophageal echocardiogram (TEE) showed a large patent foramen ovale (PFO); severe right-to-left shunting (>20 microbubbles); and a mobile, stalked thrombus in the right atrium, extending into the left atrium (Fig. 3).

The patient later had an acute ischemic stroke. No atrial thrombus was detected on repeat TEE. Antibiotic therapy and anticoagulation improved her symptoms. She later underwent percutaneous PFO closure with use of a 25-mm GORE® CARDIOFORM Septal Occluder (W.L. Gore & Associates, Inc.) (Fig. 4). Results of repeat color-flow Doppler imaging and a bubble study revealed no interatrial shunting.

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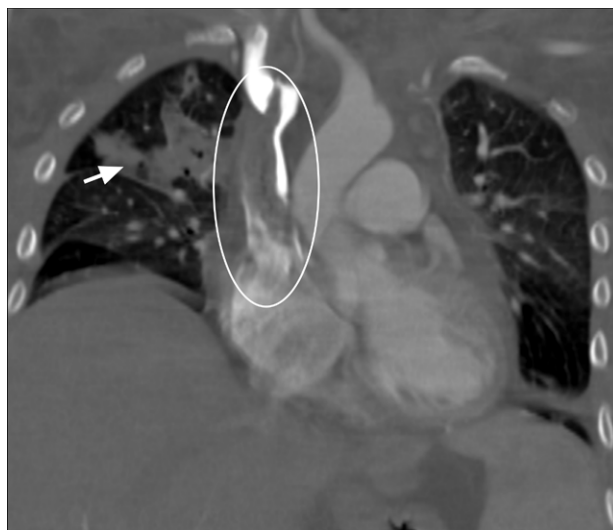


Fig. 1 Thoracic computed tomogram (coronal view) shows pulmonary embolism with surrounding consolidation (arrow) and thrombus extending from the superior vena cava to the right atrium (oval).



Fig. 2 Abdominal computed tomogram (axial view) shows extensive splenic infarcts (arrows).

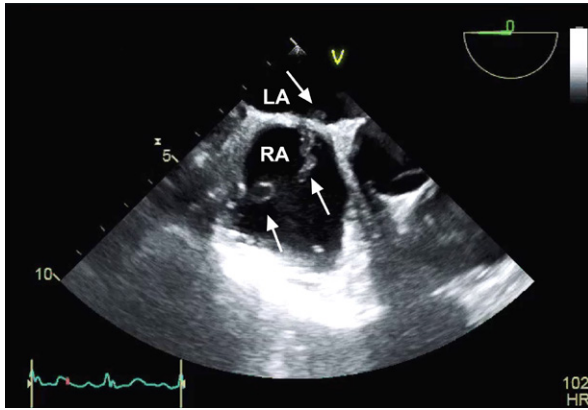


Fig. 3 Transesophageal echocardiogram (90° right midposition view) shows a mobile thrombus (arrows) extending from the right atrium (RA) into the left atrium (LA).

Supplemental motion image is available for [Figure 3](#).

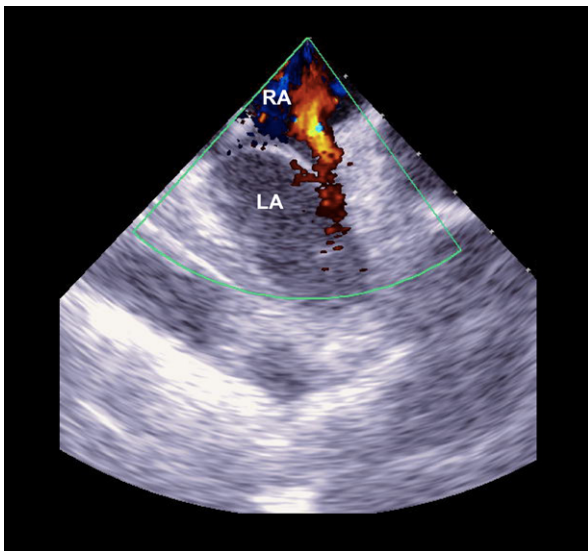


Fig. 4 Intracardiac echocardiogram (color-flow Doppler mode) shows a patent foramen ovale at the time of percutaneous closure.

LA = left atrium; RA = right atrium

Comment

Approximately one third of ischemic strokes are cryptogenic. In young adults, paradoxical embolization is a leading cause. The likely mechanism involves passage of a venous thrombus from the right-to-left circulation through either a PFO or a pulmonary arteriovenous malformation. Large PFO size, young age, and hypercoagulable states appear to be additional risk factors for paradoxical embolization.¹⁻⁴ Our patient's case indicates the usefulness of multimodal imaging for viewing the origin and embolic sequelae of a mobile thrombus as it crosses a PFO.

References

1. Chaturvedi S. Coagulation abnormalities in adults with cryptogenic stroke and patent foramen ovale. *J Neurol Sci* 1998; 160(2):158-60.
2. Donti A, Giardini A, Formigari R, Bronzetti G, Prandstraller D, Bonvicini M, Picchio FM. Treatment of recurrent stroke and pulmonary thromboembolism with percutaneous closure of a patent foramen ovale and placement of inferior vena cava filter. *Catheter Cardiovasc Interv* 2003;58(3):413-5.
3. Kent DM, Ruthazer R, Weimar C, Mas JL, Serena J, Homma S, et al. An index to identify stroke-related vs incidental patent foramen ovale in cryptogenic stroke. *Neurology* 2013;81(7): 619-25.
4. Schuchlenz HW, Weihs W, Horner S, Quehenberger F. The association between the diameter of a patent foramen ovale and the risk of embolic cerebrovascular events. *Am J Med* 2000;109(6):456-62.