

IMAGING VIGNETTE

INTERMEDIATE

CLINICAL VIGNETTE

# Utility of Computed Tomography in Diagnosis of a Patent Ductus Arteriosus in Pulmonary Artery Endarteritis



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ABSTRACT

A 15-year-old patient with infective endarteritis had a pulmonary artery vegetation but no ductus arteriosus on echocardiogram. Computed tomography scan revealed a closed ductus that became patent after antibiotics and anticoagulation. Infective endarteritis should be considered in patients with a pulmonary artery vegetation even if no ductus is seen on echocardiogram. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2023;5:101649) © 2023 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 15-year-old male patient presented with 3 weeks of fever, myalgias, back pain, fatigue, and weight loss. His vital signs were as follows: temperature 99.3° F; heart rate 118 beats/min; blood pressure 131/64 mm Hg; oxygen saturations 98% in all extremities; and respiratory rate 22 breaths/min. Examination findings included tachycardia with regular rhythm and no murmurs, clear lungs, movement limited by back pain, negative Brudzinski's and Kernig's signs, and nontender spinal processes and intervertebral spaces. There were no dental cavities or infections. No Janeway lesions or Osler nodes were seen.

Workup demonstrated leukocytosis with left shift, elevated C-reactive protein, and undetectable troponin and brain natriuretic peptide. Blood cultures grew methicillin-sensitive *Staphylococcus aureus*. An echocardiogram showed a mobile 19.6 mm × 11.5 mm mass suggestive of vegetation in the left pulmonary artery (LPA) protruding into the main pulmonary artery; no patent ductus arteriosus (PDA) was seen (Video 1). There was normal right ventricle size, function, and pressure by tricuspid regurgitation jet. A chest computed tomography (CT) scan with contrast demonstrated a hypodense mass suggestive of vegetation adherent to the main pulmonary artery and proximal LPA (Figures 1A and 1B); thrombus in the left lower lobe pulmonary artery branches (Figures 1D and 1E); and numerous pulmonary nodules, some with cavitation, consistent with septic pulmonary emboli (Figure 1F). The CT scan demonstrated a PDA (Figure 1C) that was not seen on echocardiogram, likely because of either LPA mass restricting PDA flow or echocardiographic technical differences. A magnetic resonance imaging study of the spine was consistent with T<sub>8</sub>, T<sub>11</sub>, and L<sub>1</sub> vertebral body osteomyelitis and T<sub>11</sub> to T<sub>12</sub> intervertebral discitis.

Given concern for PDA endarteritis, bacteremia, and septic pulmonary emboli, the patient received 2 weeks of nafcillin followed by 4 weeks of cefazolin. He received enoxaparin for 3 months. Flow through the PDA was seen by echocardiogram after 2 days of antibiotics and enoxaparin, and after an additional 15 days, the LPA mass was no longer seen (Video 2). After receiving 6 weeks of antibiotics per MSSA endocarditis guidelines,<sup>1</sup>

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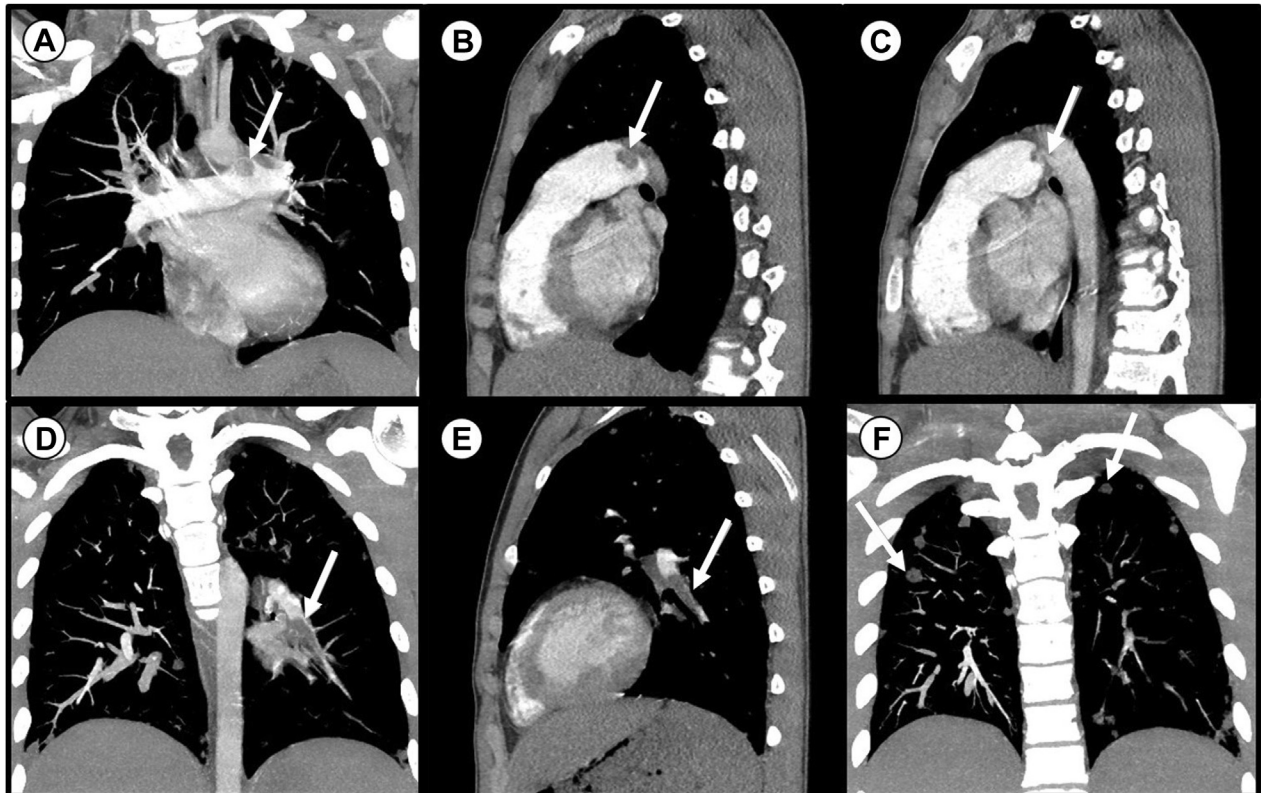
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**ABBREVIATIONS  
AND ACRONYMS****CT** = computed tomography**LPA** = left pulmonary artery**PDA** = patent ductus arteriosus

he underwent catheterization-based PDA closure with a 4-mm Amplatzer Vascular Plug II (Abbott). Although there are no specific guidelines for PDA closure after infective endarteritis, Saucedo-Orozco et al<sup>2</sup> summarized multiple papers describing patients from 1985 to 2020 with PDA-associated infective endarteritis. In 50 of 58 (86%) patients, definitive surgical or catheterization-based ductus arteriosus closure was performed after receiving antibiotics, consistent with our patient's treatment plan.

Diagnosis of PDA endarteritis can be easily delayed or missed in cases of fever of unknown origin.<sup>3</sup>

This case demonstrates the importance of having a high index of suspicion for a thrombosed PDA when a patient presents with a mass suggestive of vegetation in the LPA. Although it may not be initially visible on echocardiogram, a PDA can become apparent following anticoagulation and antibiotic treatment and may require closure. Last, CT scan is a useful tool to determine the presence of a PDA in patients with symptoms of systemic infection and LPA mass but no PDA seen on echocardiogram.

**FIGURE 1** Chest Computed Tomography Scan With Contrast

(A) Coronal slice demonstrates the mass in the main and proximal left pulmonary arteries (arrow). (B) The mass is also seen in the sagittal slice (arrow). (C) A different sagittal slice demonstrates a thrombosed small ductus arteriosus (arrow). (D) Coronal slice demonstrates thrombus in the left lower pulmonary artery (arrow). (E) Sagittal slice demonstrates thrombus in the left lower pulmonary artery (arrow). (F) Coronal slice demonstrates multiple bilateral pulmonary nodules (arrows).

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**KEY WORDS** endocarditis, imaging, thrombus

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 **APPENDIX** For supplemental videos, please see the online version of this paper.