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Case Report

Recognizing blind spots on echocardiography: Incremental benefit of cardiac CT in investigating the source of systemic embolism ☆,☆☆

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ABSTRACT

Transesophageal echocardiography is the gold-standard for evaluating potential central sources of thromboembolism. Despite its routine use and excellent safety profile, limitations exist in the ability to effectively assess the aortic arch and proximal descending aorta with this imaging modality. We herein present a case of a 59 year-old patient presenting with renal and splenic infarcts, without obvious cardioembolic source on echocardiography, who was found to have a large, mobile aortic thrombus on gated cardiac computed tomography.

Case report

A 59-year-old patient with history of tobacco use and Crohn's disease presented with sudden onset left upper quadrant pain. The patient remained hemodynamically stable without abnormal findings on physical examination. Abdominal CT identified renal (Fig. 1A) and splenic (Fig. 1B) infarcts. C-reactive protein was elevated at 90 mg/L (normal <5 mg/L); other inflammatory and hypercoagulation workup was negative. Therapeutic anticoagulation was initiated for a presumed embolic event while evaluating for a cardiac source. Transthoracic echocardiogram with bubble study did not show an intracardiac thrombus or patent foramen ovale (PFO). Transesophageal echocardiography (TEE) confirmed the absence of an intracardiac communication, left atrial appendage

Abbreviations: PFO, patent foramen ovale; TEE, transesophageal echocardiography.

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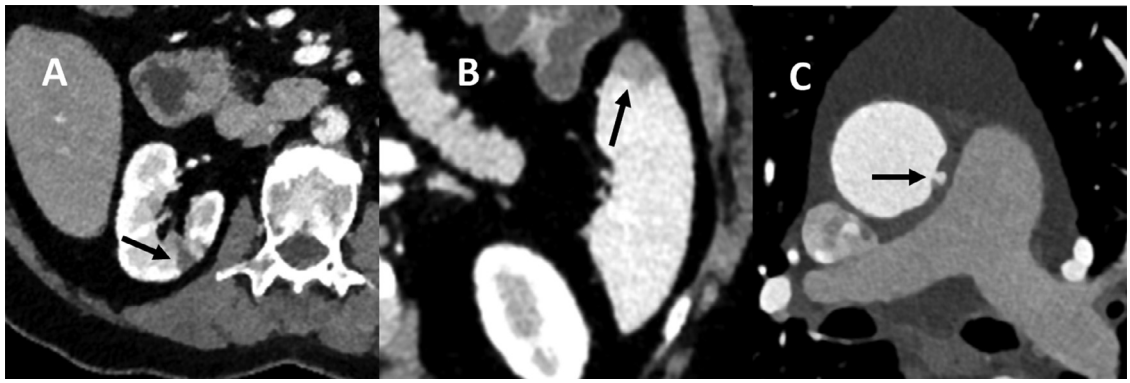

Fig. 1 – (A) Wedge-shaped defect consistent with infarction in the right kidney. (B) Wedge-shaped defect consistent with infarction in the spleen. (C) Resolution of the aortic filling defect and presence of a residual plaque with a small central ulceration.

thrombus, or vegetation. Evaluation of the proximal thoracic aorta revealed moderate-severe, non-mobile atherosclerosis of the aortic arch, but was technically limited (Video 1).

No obvious etiology was identified for multifocal systemic embolism and cross-sectional imaging was pursued. Gated cardiac CT identified an 8 mm filling defect along the medial wall of the ascending aorta, presumably an atherosclerotic plaque, with an associated branching (2.5 cm) and highly mobile thrombus (Videos 2 and 3). Noninvasive management with warfarin and other risk factor modification was pursued. Follow-up gated CT obtained 3 months after index hospitalization showed resolution of the mobile thrombus with residual atheroma and central ulceration (Fig. 1C).

Discussion

TEE is considered the "gold standard" modality for detection of potential central sources of thromboembolism, including intracardiac thrombus, infectious and noninfectious vegetation, PFO, and aortic atheroma. Despite an excellent safety profile and capacity for high resolution imaging, TEE has certain limitations. An imaging "blind spot" occurs on TEE involving the aortic arch and proximal descending aorta, which could result in missing embolic sources. Cardiac CT has the advantage of excellent spatial resolution and complete visualization of the aorta, as well as 3-dimensional evaluation with retrospective multiplanar reconstruction. Due to the prevalence of motion artifacts, ECG-gated CT studies are preferred over nongated [1]. Prospective gating is typically performed to save ionizing radiation exposure but does not allow for creation of cine-imaging. Reconstructing the cineangiography tomograms, using retrospective gating, was essential in visualizing the mobile thrombi for the above patient.

In summary, retrospective gated cardiac CT can provide complimentary information to TEE when cardioembolism is suspected, particularly in pathologies occurring at the "imaging blind-spot" of echocardiography. Finally, literature on the management of thromboembolic aortic disease is limited. Treatment with antiplatelet or anticoagulation therapy is favored given the lack of evidence supporting more invasive approaches [2].

Patient consent

The patient outlined in this case report provided written, informed consent for publication of their case.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.radcr.2023.04.002.

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