

IMAGING

IMAGING VIGNETTE: CLINICAL VIGNETTE

Multifocal Mycotic Aneurysms and Pseudoaneurysms



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ABSTRACT

Mycotic aneurysms and pseudoaneurysms, though rare, present significant diagnostic and therapeutic challenges. The case follows a 74-year-old male with a history of bladder cancer who developed multifocal mycotic aneurysms and pseudoaneurysms following sepsis. Initially misdiagnosed as a Pancoast tumor, imaging revealed an extensive disease involving the right subclavian artery, proximal descending thoracic aorta, infrarenal abdominal aorta, and right common iliac artery. This case highlights the importance of considering mycotic aneurysms in the differential diagnosis of patients with a history of infection and highlights the role of Computed Tomography Angiography in early diagnosis. (JACC Case Rep 2024;29:102440) © 2024 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/>).

Mycotic aneurysms and pseudoaneurysms are abnormal arterial wall dilations due to bacterial or fungal infections, causing vascular inflammation and damage. They can occur in various locations, commonly in the aorta, but also in peripheral and cerebral arteries, with a reported incidence of 0.7% to 3% of all aortic aneurysms.¹ Common causes include bacterial endocarditis, sepsis, intravenous drug use, and arterial wall trauma.² It is important to note that "mycotic" does not mean "fungal," whereas both are infectious processes, they are not equivalent.

CASE PRESENTATION

The case involves a 74-year-old Cuban male with a history of bladder cancer and complications from intravesical chemotherapy leading to bladder perforation and surgery. He developed gram-negative bacteremia, septicemia, and declined in functional and mental status. Over the subsequent months, he had intermittent episodes of fever and night sweats. After immigrating to the United States, he presented to the emergency department with severe radiating pain to the right upper extremity. The patient presented with altered mental status, stable vital signs, and mild tachycardia. Physical examination showed normal heart and pulmonary sounds with no abdominal pain.

An initial chest computed tomography without contrast showed a large right upper lobe mass appearing to be a Pancoast tumor invading the brachial plexus. However, a later chest computed tomography angiography (CTA) revealed this mass as a large right subclavian artery aneurysm (**Figure 1A**). In addition, multiple other aneurysms/pseudoaneurysms in various locations were also observed, including in the proximal descending

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**ABBREVIATIONS
AND ACRONYMS****CT** = computed tomography**CTA** = computed tomography
angiography

thoracic aorta (**Figure 1B**), infrarenal abdominal aorta (**Figure 1C**), and right common iliac artery (**Figure 1D**). These findings, in conjunction with the patient's history of previous gram-negative septicemia, raised strong suspicion for multifocal mycotic aneurysms and pseudoaneurysms (**Video 1**). There was no rupture described in the images. The patient underwent stenting of the right subclavian artery aneurysm and proximal descending thoracic aortic pseudoaneurysm.

DISCUSSION

Diagnosing mycotic aneurysms can be challenging due to their nonspecific systemic infection signs. This patient presented with right upper extremity pain, indicative of subclavian artery aneurysms, which can also cause dyspnea, hemoptysis, and hoarseness. Risk factors include intravenous drug use, atherosclerosis, cystic medial necrosis, and diabetes.¹ Mycotic subclavian artery aneurysms are exceptionally rare, with only a few cases reported. The most common pathogens associated with mycotic aneurysms are *Staphylococcus aureus*, *Salmonella spp*, and *Pseudomonas aeruginosa*.²

Blood cultures are crucial for diagnosis, with positive results in 50% to 85% of cases, although a negative result does not rule out the diagnosis. Because of its high isotropic and spatial resolution, CTA plays a crucial role in identifying and evaluating the extent of mycotic aneurysms and adjacent anatomic structures, particularly in rare cases such as this one. However, magnetic resonance angiography is an alternate diagnostic modality due to its multisequence and multiplanar capabilities.

Treatment strategies for mycotic aneurysms include endovascular and surgical intervention. Endovascular treatment is increasingly used due to its less invasive nature and potential to reduce morbidity and mortality.³ It is important to consider the potential risk of reinfection with endovascular treatment. Despite their minimally invasive nature, these procedures can leave behind infected material or fail to completely eradicate the infection.

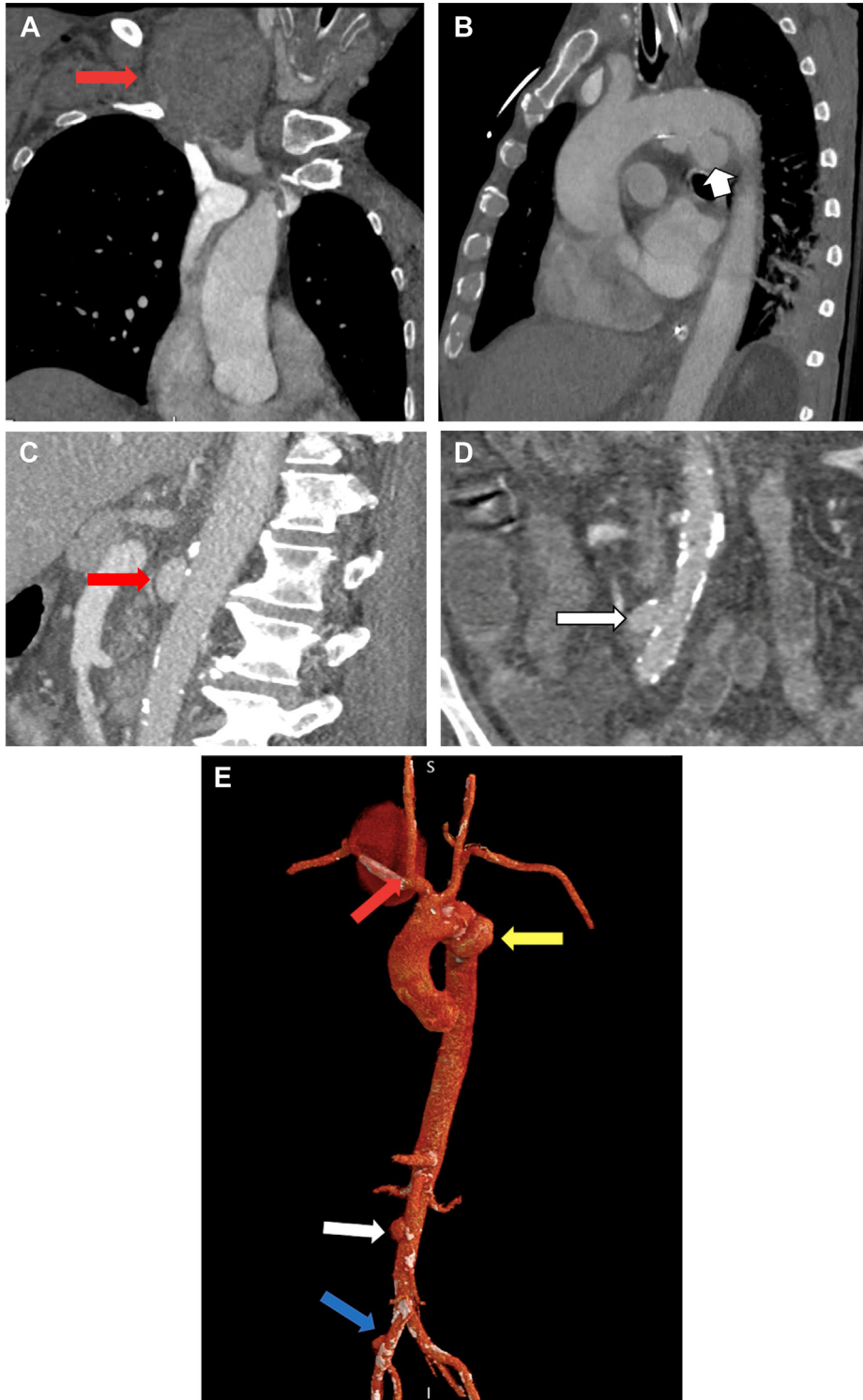
Diagnosing mycotic aneurysms is challenging. CTA is crucial for diagnosis and treatment planning. Negative blood cultures do not rule out the diagnosis. These cases require a multidisciplinary approach to diagnosis and treatment.

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FIGURE 1 CT Images and 3D Reconstruction of Aortic Aneurysms and Pseudoaneurysms



(A) Coronal computed tomography angiography (CTA) image showing a large thrombosed right subclavian artery aneurysm measuring 8.0 cm (red arrow). (B) Sagittal CTA image depicting a bilobed proximal descending aortic pseudoaneurysm (white arrow). (C) Sagittal CTA image showing an infrarenal abdominal aortic pseudoaneurysm (red arrow). (D) Coronal CTA image depicting a bilobed proximal descending aortic pseudoaneurysm (white arrow). (E) Three-dimensional volume rendered image. Right subclavian artery aneurysm s/p stent (red arrow) is shown. Descending thoracic aortic pseudoaneurysm is shown (yellow arrow). Infrarenal abdominal aortic pseudoaneurysm is shown (white arrow). Right common iliac artery pseudoaneurysm is shown (blue arrow).

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KEY WORDS CT angiography, mycotic aneurysms, pseudoaneurysms

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