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Case Report

Infective Endarteritis and Mycotic Pseudoaneurysms in a Pediatric Patient With Aortic Coarctation

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ABSTRACT

An 11-year-old boy presented with *Staphylococcus aureus* infective endarteritis and mycotic pseudoaneurysms within the context of a previously undiagnosed aortic coarctation. He had an urgent resection of the pseudoaneurysm and coarctation repair. Nuances to his initial diagnosis and key learning points related to the complication of pseudoaneurysm are discussed.

RÉSUMÉ

Un garçon de 11 ans a présenté une endartérite infectieuse à *Staphylococcus aureus* et des pseudo-anévrismes mycotiques dans le contexte d'une coarctation de l'aorte non diagnostiquée antérieurement. Il a subi une résection urgente du pseudo-anévrisme et une réparation de la coarctation. Nous discutons des différences subtiles qui ont mené à ce diagnostic initial et des principaux enseignements tirés de la complication du pseudo-anévrisme.

Case

A previously well, unimmunized 11-year-old boy presented to his local hospital with fever and severe abdominal and lower limb pain. He was transferred to a tertiary pediatric centre for a comprehensive workup. On examination, his right arm blood pressure (BP) was 134/83 mm Hg, and he had a persistent arm-leg systolic BP gradient of 25 to 30 mm Hg. He had a 3/6 systolic ejection murmur, loudest at the left sternal border and had weak femoral pulses. He was noted to have a petechial rash limited to his lower limbs. Blood cultures were positive for methicillin-sensitive *Staphylococcus aureus*. A transthoracic echocardiogram (TTE) revealed a previously undiagnosed aortic coarctation (CoA) and a well-functioning bicuspid aortic valve. There was a string-like vegetation distal to the CoA (Video 1; view video online). A computed tomography (CT) scan of the abdomen showed near complete splenic infarction and small bilateral renal infarcts secondary to suspected septic emboli. The results of a magnetic resonance imaging (MRI) brain scan were normal. He received intravenous antibiotics with a plan to repair his CoA after a full course of antibiotics. His symptoms improved; however, a subsequent CT scan of his thorax, performed 19 days after his initial presentation, revealed 2 saccular outpouchings of the aorta just distal to the CoA, presumed to be mycotic pseudoaneurysms (Fig. 1).

Because of the risk of pseudoaneurysm rupture, the patient underwent urgent surgical correction with pseudoaneurysm resection and CoA repair. An 18-mm Gore-Tex interposition graft was required because of the length of resected aorta. Histopathology confirmed formation of pseudoaneurysm, associated with large colonies of bacteria. Postresection, the patient had strong femoral pulses and no significant BP gradient. There was ongoing hypertension that responded to nadolol. He received a 6-week course of intravenous cefazolin postoperatively.

Discussion

CoA is commonly detected in early infancy, presenting with a heart murmur, absent or decreased femoral pulses, and/or an arm-leg BP gradient. Neonates with severe CoA may present with heart failure or shock. Complications of unrepaired CoA are numerous and are mostly related to uncontrolled hypertension. This patient presented with CoA later in life; however, unlike most cases of missed CoA, which present with murmur or persistent hypertension, he also presented with infective endarteritis. Infective endarteritis is a rare and serious presentation of CoA.[1] This case is unique in presentation, and it highlights key learning points with respect to the diagnosis of CoA and endarteritis as well as the imaging and management of pseudoaneurysms.

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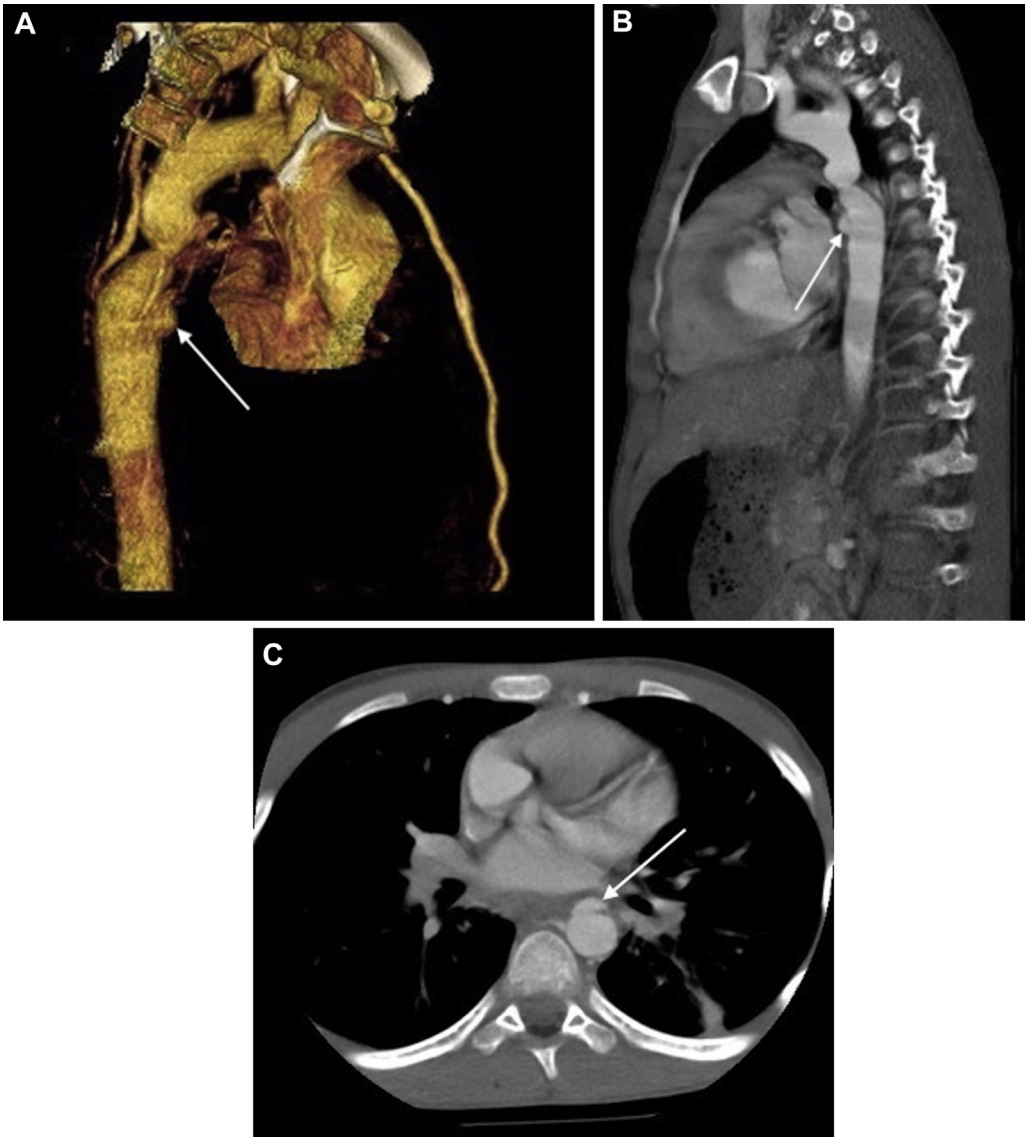

Figure 1. CT showing pseudoaneurysm (**arrow**) distal to the CoA in (**A**) 3D reconstruction, (**B**) sagittal, and (**C**) transverse views.

The first learning point relates to his diagnosis of CoA and endarteritis. This patient's elevated right arm BP was initially thought to be related to pain, which underscores the importance of performing a 4-limb BP in any patient with a new murmur, regardless of age. The diagnosis of endarteritis was suspected even before confirmation of CoA, based on the pattern of his petechiae and pain limited to the lower body. Whenever infective endocarditis is suspected, peripheral stigmata affecting both the hands and feet should be sought.

The second key learning point relates to pseudoaneurysms. Mycotic aneurysms are known complications of infective endocarditis, usually secondary to hematogenous transmission into peripheral arteries. There have been reports of direct transmission from vegetations at the site of a patent ductus arteriosus or CoA both pre- and postrepair.[1] These aneurysms are often clinically silent. The timing of their development is variable, with aneurysm formation in as little as 8 days.[2] Guidelines suggest that surgery may be necessary to prevent the catastrophic complications of rupture; however, no specific recommendations have been made regarding the timing of repair.[3] Immediate surgery reduces the likelihood of spontaneous rupture;[1] however, waiting for blood cultures to clear or for a full antibiotic course may reduce the surgical risk or risk of recurrent infection.[4] There have been reports of aneurysms rupturing after diagnosis while antimicrobial treatment was under way.[4] There are no guidelines regarding screening for mycotic aneurysms.

In our case, TTE was sufficient to diagnose the CoA and infective endarteritis; however, it did not detect the mycotic pseudoaneurysms. Transesophageal echocardiography has been suggested to be a superior imaging modality to TTE with respect to identifying endarteritis and aneurysms.[5] However, given the need for sedation, and that even transesophageal echocardiography cannot rule out mycotic aneurysm, we suggest that any patient with suspected endarteritis receive definitive imaging (CT or cardiovascular magnetic

resonance [CMR] imaging) at diagnosis. If surgery is delayed, this imaging should be repeated, although the exact timing remains unclear.

Learning Points

1. A thorough physical examination, including the presence and location of peripheral stigmata, will aid in the diagnosis of CoA and infective endarteritis.
2. Mycotic aneurysms must be ruled out in patients with infective endarteritis.
3. The optimal timing for mycotic aneurysm repair remains unclear. If surgery is delayed, monitoring should be performed in the hospital, as emergency intervention may be required for aneurysm rupture.

Disclosures

The authors have no conflicts of interest to disclose.

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Supplementary Material

To access the supplementary material accompanying this article, visit the online version of the *Canadian Journal of Cardiology* at www.onlinecjc.ca and at https://doi.org/10.1016/j.cjca.2019.02.008.