Use of 18F-Fluorodeoxyglucose Positron Emission Tomography–Computed Tomography and Sonication for Detection of Infection After Peripheral Stent Fracture

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A 82-year-old man was admitted to the Department of Infectious Diseases with fever, confusion, and back pain, 2 months after undergoing peripheral vascular reconstruction including right common femoral endarterectomy with polyester-urethane patch closure (Braun Melsungen AG, Melsungen, Germany) in association with stenting of the superficial femoral artery (LifeStent, Bard Peripheral Vascular, Tempe, AZ). Physical examination revealed a pulsatile mass at the right midthigh level without skin ulceration (Figure 1). Blood tests showed a C-reactive protein level at 123 mg/L (normal, <5 mg/L) with white blood cell count of 15/μL (neutrophils, 12/μL). Magnetic resonance angiography of the head and trunk demonstrated an L4 to L5 peridural abscess and brain infarctions with hemorrhagic lesions (data not shown). Transesophageal echocardiography showed mitral valve vegetations (Figure 2), and blood cultures identified methicillin-sensitive Staphylococcus aureus. On the basis of these findings, the diagnosis was mitral endocarditis complicated by brain septic embolism and spondylodiscitis. To complete workup and locate the source of infection, it was decided to perform 18F-fluorodeoxyglucose positron emission tomography–computed tomography that allows whole body imaging and has proven useful for endocarditis staging.1 Focal uptake was discovered not only on mitral valve and at the L4 to L5 level but also on the stent at the right midthigh level (Figure 3). Computed tomography angiogram showed complete fracture and dislocation of the stent that was completely surrounded by pseudoaneurysm (Figure 4). A multidisciplinary team including a cardiologist, infectiologist, anesthetist, and surgeons decided to perform staged treatment beginning with the right thigh pseudoaneurysm and followed by mitral valve replacement. The presence of hemorrhagic lesions in the brain was a temporary contraindication to extracorporeal circulation because of the need for high-dose heparinization. Under general anesthesia, the superficial femoral artery was approached under general anesthesia, the superficial femoral artery was approached and dislocation of the stent that was completely surrounded by pseudoaneurysm (Figure 4) were removed, and a saphenous vein was interposed to restore superficial femoral artery continuity. The explanted stent was sent to 2 laboratories for bacteriologic investigation. In 1 laboratory, standard blood culture remained negative. The second laboratory performed culture on the fluid obtained after sonication of the stent in an Aquasonic Model 750T ultrasound bath (VWR Scientific Products, Brisbane, CA) at a frequency of 45 kHz for 8 minutes. Using this approach, the same bacterium found in blood cultures was isolated, thus confirming stent infection corresponding with the foci visualized by 18F-fluorodeoxyglucose positron emission tomography–computed tomography.

A recent study showed that stenting of the superficial femoral artery is associated with a high rate of stent fracture generally with minimal clinical impact.2 In the complex case described here, fluorodeoxyglucose uptake by the stent fracture and not the synthetic patch allowed us to suspect infection rather than postoperative inflammation and compelled us to remove the stent. During subsequent bacteriologic analysis of the explanted stent to confirm infection, sonication allowed for extraction and identification of microorganisms adhering to the biofilm and enabled targeted antibiotherapy.3 This case report indicates that new imaging techniques and microbiology methods, that is, positron emission tomography–computed tomography and sonication, respectively, are useful diagnostic tools in management of complex vascular device infection.

Disclosures

None.

References


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Figure 1. Clinical examination of right thigh revealed a pulsatile mass (dotted circle).

Figure 2. A, Transesophageal echocardiography (64° bicommissural view) showed mitral valve vegetations (red dotted line). B, Maximum vegetation diameter.
Figure 3. A, 18F-fluorodeoxyglucose positron emission tomography–computed Tomography volume rendering showed intense metabolic activity associated with infection foci on mitral valve (arrowhead), L4 to L5 discus (thin arrow), and stent in right thigh (thick arrow). Transverse images demonstrated focal areas of uptake on (B) mitral valve and (C) femoral stent.

Figure 4. A, Conventional front x-ray view demonstrated stent fracture (white arrow). B, Computed tomography-angiogram revealed a pseudoaneurysm (asterisk); black arrowheads represent stent tips.

Figure 5. Postoperative macroscopic photographs (A) showed the presence of an organized pseudoaneurysm around the fractured stent. B, Details of stent fracture.
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