Early infected aneurysm with ^{18}F-FDG uptake prior to substantial anatomical changes

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CASE PRESENTATION

A 79-year-old female presented with a 2-month history of chest pain. Computed tomography (CT) showed hilar and mediastinal lymphadenopathy and lysis and destruction in the sternum. Bone metastasis was suspected, and she underwent ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/CT to identify the primary lesion. ^{18}F-FDG PET/CT images demonstrated avid uptake in the sternum and lymph nodes and focal increased uptake within the wall of the ascending aorta and aortic arch (Figure 1). CT showed no anatomical abnormalities. Three weeks after ^{18}F-FDG PET/CT, contrast-enhanced CT demonstrated aneurysmal dilatation corresponding to the intense FDG uptake (Figure 2). Echocardiography was performed, but it did not show any vegetation or other abnormalities. One month after antibiotic treatment, follow-up ^{18}F-FDG PET/CT images showed decreased FDG uptake in the sternum and ascending aorta and aortic arch (Figure 3). She finally underwent surgical repair, and pathological examination revealed infection in the aneurysm wall. The sternal lesion was clinically diagnosed as suppurative osteomyelitis.

It can be difficult to diagnose infected aneurysm without typical signs. CT can demonstrate anatomical changes of the aorta, but not inflammation of the vessel wall in the early phase because of the absence of anatomical changes.[1] ^{18}F-FDG PET detects an increased glucose metabolic rate that is characteristic of aortic wall inflammation.[2] Previous reports showed positive results of ^{18}F-FDG PET/CT studies in patients with infected aneurysm.[3,4] Moreover, focal ^{18}F-FDG uptake in aortic aneurysm corresponded to the site of aneurysm rupture. This case highlights the value of ^{18}F-FDG PET/CT to diagnose infected aneurysm in the early stage prior to substantial anatomical changes.

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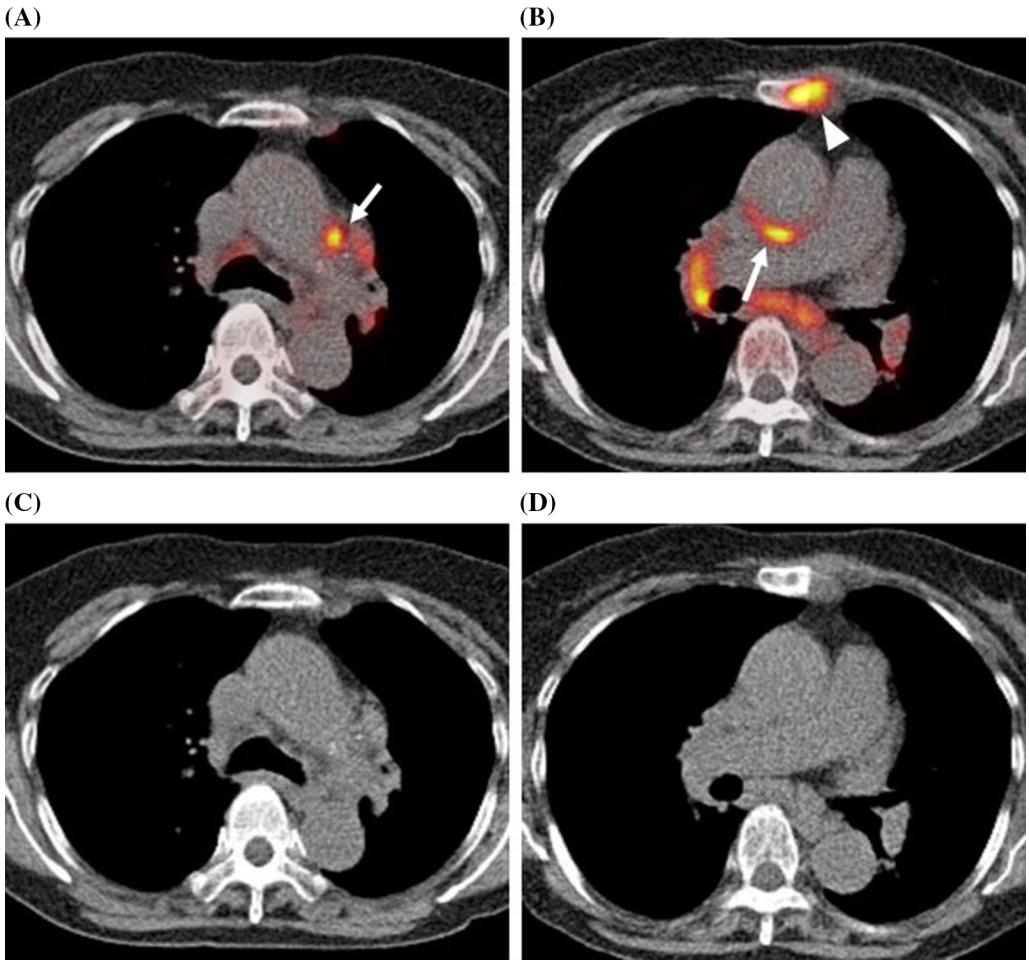

Figure 1. ^{18}F-FDG PET/CT fusion images (**A**, **B**) showing focal increased uptake within aortic arch (arrow) and ascending aorta (arrow) and avid uptake in sternum (arrowhead) and mediastinal and hilar lymph nodes (**B**). Anatomical abnormalities absent on CT (**C**, **D**).

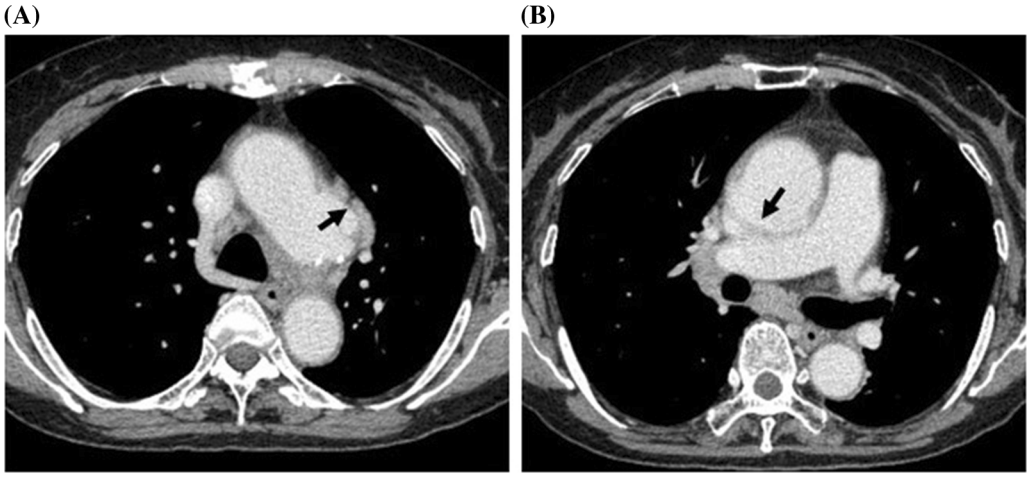

Figure 2. Three weeks after initial ^{18}FDG-PET/CT, contrast-enhanced CT images (**A**, **B**) demonstrating aneurysmal dilatation of aortic arch (arrow) and ascending aorta (arrow) corresponding to the intense ^{18}FDG uptake.

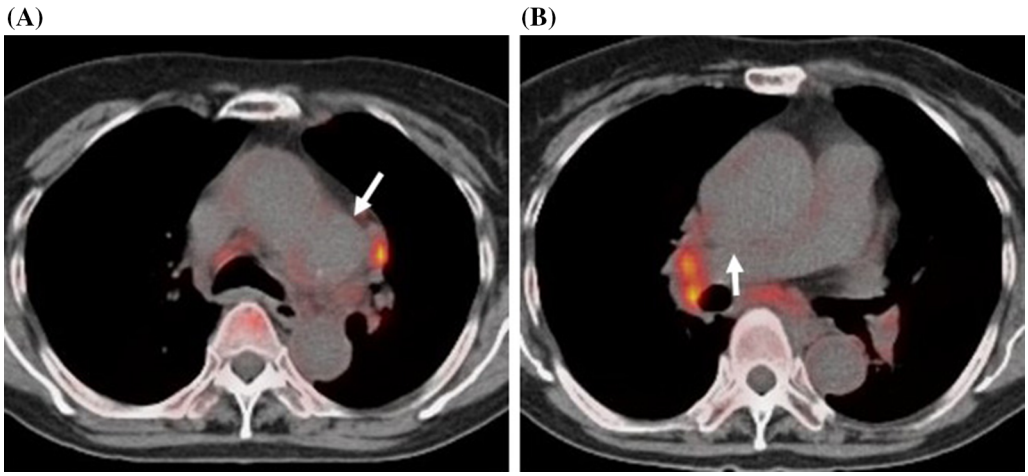

Figure 3. One month after antibiotic treatment, ^{18}F-FDG PET/CT fusion images (**A**, **B**) showing decreased FDG uptake within the wall of aortic arch (arrow) and ascending aorta (arrow). ^{18}F-FDG PET/CT fusion images also show decreased uptake in the sternum and hilar and mediastinum lymph nodes.

Disclosure

None of the authors have any conflicts of interest.

References

1. Choi SJ, Lee JS, Cheong MH, Byun SS, Hyun IY. F-18 FDG PET/CT in the management of infected abdominal aortic aneurysm due to Salmonella. Clin Nucl Med 2008;33:492–5.
2. Courtois A, Nusgens BV, Hustinx R, Namur G, Gomez P, Somja J, et al. ^{18}F–FDG uptake assessed by PET/CT in abdominal aortic aneurysms is associated with cellular and molecular alterations prefacing wall deterioration and rupture. J Nucl Med 2013;54:1740–7.
3. Mikail N, Benali K, Ou P, Slama J, Hyafil F, Le Guludec D, et al. Detection of mycotic aneurysms of lower limbs by whole-body ^{18}F-FDG-PET. JACC Cardiovasc Imaging 2015;8:859–62.
4. Bonekamp D, Smith JD, Aygun N. Avid FDG uptake in a rapidly enlarging common carotid artery mycotic aneurysm, mimicking lymphadenopathy. Emerg Radiol 2009;16:383–6.