Mycotic Aneurysm of the Aorta as an Unusual Complication of Coronary Angiography

H. van der Wal*, P.P. van Geel, R.A. de Boer

Department of Cardiology, Thorax Centre, University Medical Centre Groningen, Hanzeplein 1, PO Box 30.001, 9700 RB Groningen, The Netherlands

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Abstract
Introduction: Mycotic aneurysm of the aorta is a rare diagnosis with high mortality. Report: Percutaneous coronary intervention was complicated by bacteremia with Staphylococcus aureus and a mycotic aortic aneurysm, an unusual complication of coronary angiography. Combining CT and PET scan showed a hotspot in the thoracic aorta. After six months of antibiotic treatment she fully recovered. Repeated CT/PET scanning revealed complete abolishment of the aortic abnormalities. Discussion: This report suggests that diagnosing and follow-up of aortitis is feasible with combined CT/PET scan and may help in determining choice and duration of therapy.

Introduction
A mycotic aneurysm of the aorta is a rare diagnosis with high mortality. Worse outcome is predicted by delayed diagnosis and rupture at time of surgery. Infected aneurysms are classified in four types: a) true mycotic aneurysms, b) secondary mycotic aneurysms due to bacterial arteritis, c) infected pre-existing aortic aneurysms and d) post-traumatic infected false aneurysms. Here we present a patient with a secondary mycotic aneurysm due to bacterial infection.

Report
A 62-year old woman with a history of coronary artery disease presented with unstable angina. Coronary angiography revealed 2-vessel disease. A PCI with a drug-eluting stent was performed successfully on a lesion in the circumflex artery.

Because of unexplained hypotension (systolic blood pressure (SBP) of 95 mmHg), and subfebrile temperatures the patient stayed hospitalized. The third day she developed evening fever up to 40 °C and became more hypotensive (SBP 70 mmHg). C-reactive protein (CRP) rose from 33 to 160 mg/L (normal: <5). We empirically started broad
spectrum antibiotics, amoxicillin/clavulanic acid in combination with vancomycin. One of the blood cultures tested positive with Staphylococcus Aureus.

Because no clear focus for infection was found, we performed on the sixth day both a CT and a $^{18}$F fluorodeoxyglucose (FDG) positron emission tomography (PET) scan. These examinations revealed a marked hotspot in the thickened thoracic aorta wall (Fig. 1). A diagnosis of mycotic aneurysm of the thoracic aorta was established. After multidisciplinary discussion it was decided to treat with antibiotics.

One week after the diagnosis the patient deteriorated with sudden hypotension, and thoracic pain. A CT scan showed a dilatation of the thoracic aorta with a high risk of rupture. An emergency thoracic endovascular stent-graft (Zernith) was successfully placed.

The patient had a prolonged recovery, with several switches of antibiotics due to side effects, such as renal function disorders. After 11 weeks she left the hospital in good condition. Oral clindamycin was continued for 6 months.

The patient had a complete recovery on this therapy. Two months after cessation of therapy, CRP was 6 mg/L, and a repeat $^{18}$F FDG PET scan in combination with CT scan showed complete remission of infection activity and thickening of the thoracic aorta wall (Fig. 2). There was no stent-grafting related complication or re-infection during follow-up.

Discussion

To the best of our knowledge, this is the first case of mycotic aneurysm of the aorta after CAG. The main goal of treatment is eradication of infection by surgery with

![Figure 1](image1.png) Thickening of wall of the descending aorta on CT scan is clearly visible from coronal (image A), sagittal (image B), and horizontal planes (image C). A hot spot is observed on PET scan (coronal, sagittal, and horizontal planes, G, H, and I, respectively). Merging the two scans revealed a hot spot in the descending aorta (images D, E, F), diagnostic for mycotic aneurysm of the thoracic aorta. F = view of feet, A = anterior side of patient, L = left view of patient.
adjuvant antibiotics.\textsuperscript{1,2} The required duration of antibiotic therapy is not well established; recommendations range from 6–12 weeks to lifelong, with no difference in outcome.

Antibiotic treatment is rarely used as sole therapy, because of a definite risk of rupture; nevertheless we initially chose this therapy because of high surgical risk. Because of acute risk of rupture, endovascular repair with a stent was performed later. This therapy was first described in a series in 1998, showing no stent-related complications during two year follow-up.\textsuperscript{3}

Disease activity can be monitored by control of infection parameters, and CT scan, because recurrent or persistent aortic or graft infections might occur.\textsuperscript{4}

Besides CT we used \textsuperscript{18}F-FDG PET for several reasons. Our patient started with fever of unknown origin, and \textsuperscript{18}F-FDG PET contributes to the diagnosis in 25–69\% of such patients. CT data being merged with PET data aid in the exact localization of the site of FDG uptake.\textsuperscript{4}

In our case we monitored remission of the infection with combined CT and PET scanning. In large-vessel vasculitis FDG PET is a reliable method of monitoring disease activity and response to therapy. Normalization of FDG uptake during follow-up clearly correlates with clinical improvement and normalization of laboratory findings.\textsuperscript{4}

Naturally, we cannot conclude whether CT/PET scan is superior to CT scan alone in monitoring the response to therapy. This case report however suggests that follow-up of aortitis is feasible with combined CT/PET scan and may prove helpful in determining the choice and duration of therapy.

\textbf{Figure 2} Same planes as in Fig. 1. After 6 months of antibiotic therapy the CT scan and PET scan have normalized. Note the intra-aortic stent visible on CT scan and the normal basic activity on PET scan. (There is change in diameter due to scale difference).
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References