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Very Late Mycotic Pseudoaneurysm Associated With Drug-Eluting Stent Fracture

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A 72-year-old woman with diabetes mellitus and end-stage ischemic heart disease was admitted to the hospital because of an episode of unstable angina. She had undergone coronary artery bypass graft surgery 4 years earlier with sequential left internal mammary artery to left anterior descending and diagonal artery, and saphenous vein graft to left marginal artery. Seven months after surgery, because of disease progression, she underwent a percutaneous coronary intervention with rotational atherectomy and a 3.5×32 mm paclitaxel-eluting stent implantation at the right coronary artery. During the following years, the patient had several admissions for unstable angina. A new angiography showed a diffusely diseased native vessel, an occluded saphenous graft to the marginal, a patent sequential left internal mammary artery graft to left anterior descending and diagonal artery, and persistence of the good result of the stent implanted in the right coronary artery. Because of the extension and severity of the coronary artery disease, she had been considered a no-option patient.

During the present admission (1-year after the last angiography) she experienced fever and superficial phle-

bitis secondary to peripheral venous catheter that was treated with cloxacillin for 10 days. Five weeks later she was readmitted for persistent fever. The results of the physical examination were unremarkable, but laboratory evaluation showed leukocytosis and blood cultures positive for *Staphylococcus aureus*. Treatment with cloxacillin and gentamicin was initiated. Transthoracic echocardiography ruled out valvular vegetations but showed a mass in the atrioventricular groove (Figure 1A). Magnetic cardioresonance confirmed the presence of a mass (Figure 1B), considered in the initial differential diagnosis a cardiac tumor, such as an angiosarcoma. A whole-body ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography study was performed to evaluate the cardiac mass and stage the suspected oncological disease. ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography showed greatly increased glucose metabolism in the periphery of the cardiac mass (Figure 2A and 2B), with no other findings in the rest of the body. Finally, multidetector computed tomography (Figure 2C and 2D) provided the diagnosis: a giant pseudoaneurysm associated with stent fracture at the right coronary artery

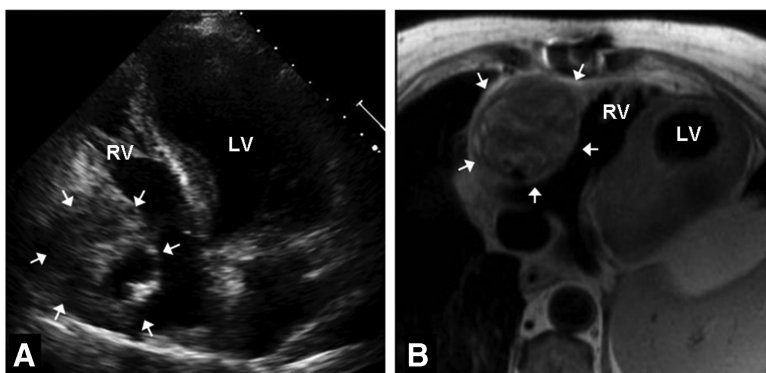


Figure 1. A, Transthoracic echocardiography. Apical 4-chamber view showing a heterogeneous mass (5.6×4.6 cm) with well-defined borders arising from the atrioventricular groove (arrows) that compress to both right ventricle (RV) and atrium. **B,** Magnetic cardioresonance. T1-weighted spin-echo sequence. Axial plane showing well-defined mass located under the visceral pericardium (arrows) that has a heterogeneous signal and protrudes into the right chambers. LV indicates left ventricle; RV, right ventricle.

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The online-only Data Supplement is available with this article at <http://circ.ahajournals.org/lookup/suppl/doi:10.1161/CIRCULATIONAHA.111.051508/-/DC1>.

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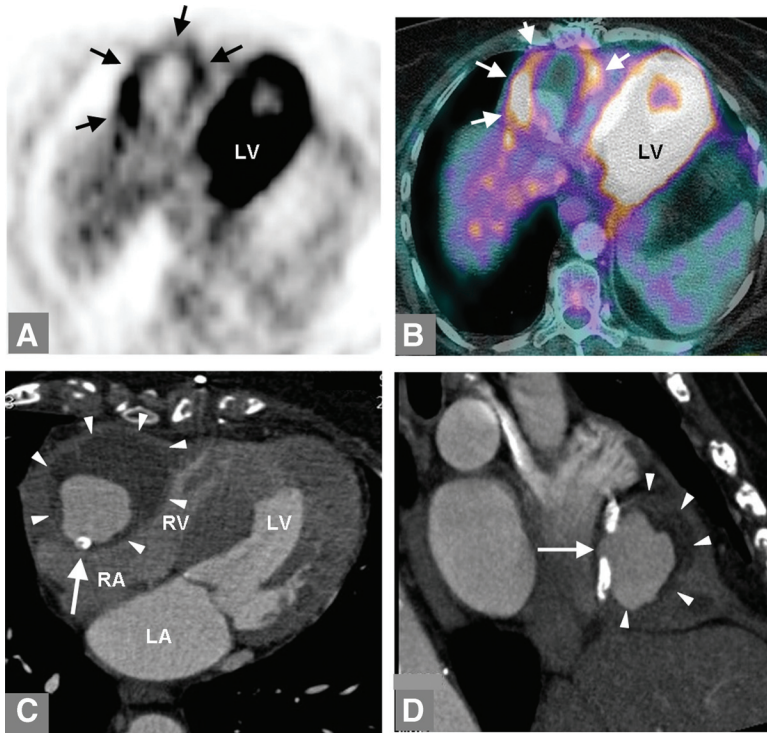


Figure 2. A and B, ¹⁸F-FDG PET/CT. Axial plane. PET (A), and PET-CT fusion (B) images demonstrate increased glucose metabolism at the periphery of the cardiac mass (arrows). C, 64-slice multi-detector coronary CT angiography. Axial plane. Mass in the atrioventricular groove. Cavity of pseudoaneurysm with contrast inside and peripheral area of low attenuation (head arrows), in connection with the stent previously implanted on right coronary artery (large arrow). D, 64-slice multi-detector coronary CT angiography. Coronal plane. Solution of continuity in the middle of the stent at the right coronary artery (large arrow). Cavitated structure in connection with the lumen of the artery, corresponding to a coronary pseudoaneurysm (head arrows). LA indicates left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle; ¹⁸F-FDG, ¹⁸F-fluorodeoxyglucose; PET, positron emission tomography; CT, computed tomography.

that was subsequently confirmed by coronarography (Figure 3 and online-only Data Supplement Movie I). The patient underwent surgery, the mycotic pseudoaneurysm was debrided, the coronary artery stent was removed, and a saphenous vein graft was placed to the posterior descending artery (Figure 4A). A histological study of the pseudoaneurysm revealed the presence of mixed inflammation; no microorganisms were found (Figure 4B). After surgery, the patient experienced an inferior myocardial infarction and died of refractory ventricular arrhythmias.

Discussion

Coronary stent infection is a rare complication, but it is associated with high mortality and morbidity. To date, only 24 cases have been reported. *S aureus* was the most frequently isolated organism. Septicemia in these patients occurred any time from 1 day to 11 months after the percutaneous coronary intervention, but most tended to concentrate within the first month.¹ Most of the cases resulted in severe

damage of the arterial wall, producing mycotic aneurysm or pseudoaneurysm. To our knowledge, this is the first case of very late stent infection (3 years after stent implantation) that is associated with a large stent disruption. Recent studies show the lack of endothelial coverage of drug-eluting-stent even years after stent implantation.² It is believed that the persistently exposed stent struts may provide a nidus for infection during an episode of bacteremia. However, in this particular case, we postulate that previous stent fracture was a predisposing condition for the infection. The microorganisms may adhere and cause the infection at the point of the fracture. Coronary stent fracture is an infrequent complication of coronary intervention and is associated with drug-eluting-stent stenosis and thrombosis.^{3,4} The widespread use of drug-eluting-stent makes even rare complications affect a large number of patients. Therefore, further studies are needed to clarify the mechanisms leading to stent infection and fracture.

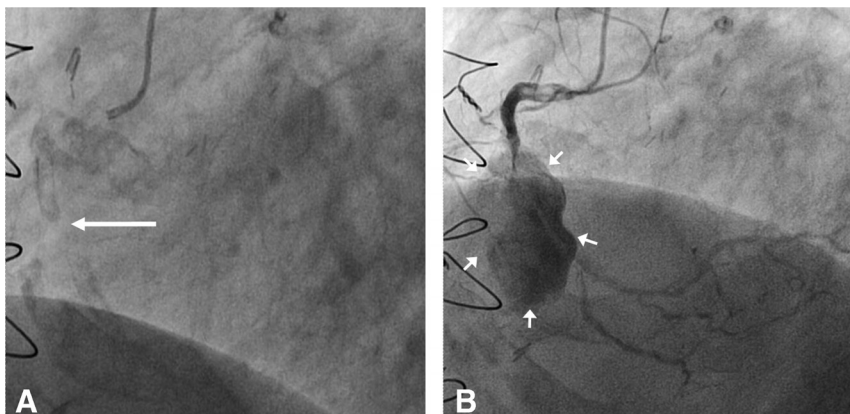


Figure 3. A, Coronary angiography. Left anterior oblique projection showing the site of the stent fracture (large arrow). B, Coronary angiography. Left anterior oblique projection showing contrast medium extravasation into a large mycotic pseudoaneurysm (arrows).

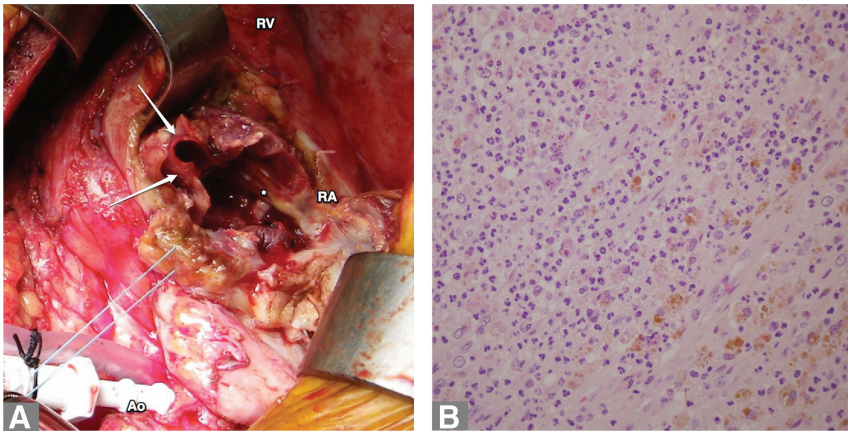


Figure 4. **A**, Intraoperative picture showing the pseudoaneurysm after opening and aspiration of the cavity (arrows), and the ostium of the right coronary artery (asterisk). **B**, Olympus BX40 optical microscope. Hematoxylin-eosin stain (40 \times) showing fibrin and mixed inflammation with neutrophils, eosinophils, macrophages (left side of the picture) and hemosiderin-laden macrophages (at the right side of the picture). RA indicates right atrium; RV, right ventricle.

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Disclosures

None.

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