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Giant mycotic aneurysms of the coronary artery after stent implantation for myocardial infarction due to infective endocarditis

Short title: Giant mycotic aneurysms of the coronary artery

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A 40-year-old man presented to our department with anterior ST-segment elevation myocardial infarction (Supplementary material, *Video S1*). He underwent emergency primary percutaneous coronary angioplasty of the left anterior descending artery (LAD) with implantation of 2 drug-eluting stents (Supplementary material, *Video S2*). The patient had no cardiovascular risk factors. However, intravascular imaging was not performed because of hypotension and early pulmonary edema.

During hospitalization, the patient was diagnosed with infective endocarditis caused by *Streptococcus salivarius* and received antibiotic treatment. He also underwent mitral valve replacement for severe mitral regurgitation with vegetations and splenectomy for splenic infarction. Echocardiography at 12 months revealed an additional chamber without communication with the cardiac chambers (*Figure 1A*, Supplementary material, *Video S3*) and reduced left ventricular ejection fraction with apical akinesis (30% vs. 39% on previous examination).

The patient reported no angina or heart failure symptoms, and there were no clinical or laboratory signs of inflammation. Coronary angiography revealed 2 giant aneurysms (46 × 32 mm and 23 × 20 mm) at the site of stent implantation, with a slow blood flow into the LAD (Figure 1B; Supplementary material, *Video S4*). The shape and neck of the aneurysms were assessed by computed tomography (Figure 1C). It revealed the fusiform morphology of aneurysms covering a segment of previously implanted stents, with only a narrow connection along most of the length between the vessel wall and stents.

Because of the aneurysm anatomy and previous stent implantation, the patient was considered ineligible for another cardiac surgery. Although there are currently no recommendations for the management of giant coronary artery aneurysms, we chose interventional treatment owing to the potential risk of complications [1]. While there are no covered stents specifically designed for the treatment of coronary aneurysms, we decided to apply PK Papyrus stents (Biotronik AG, Bülach, Switzerland) outside of indications for use. Intravascular ultrasound (IVUS) confirmed a fragmented connection between stent and vessel walls, resembling an underwater pipeline fully anchored only at the distal end (Figure 1D; Supplementary material, *Video S5*). Once the landing zones were determined by IVUS, 2 covered stents (3.5 × 26 mm) were implanted and postdilated with a noncompliance balloon (4.5 × 12 mm). Under IVUS guidance, another drug-eluting stent (4.5 × 12 mm) and noncompliance balloon (5 × 12 mm) were used for additional sealing at the proximal aneurysm neck, because of the covered stent malapposition (Supplementary material, *Video S6*, *Video S7*). This improved blood flow into the LAD (Figure 1E; Supplementary material, *Video S8*). Computed tomography at 3 months revealed embolization of the aneurysm and reduced aneurysm size (Figure 1F). Echocardiography showed no additional chamber (Supplementary material, *Video S9*). Mycotic coronary aneurysms are rare, especially those caused by stent implantation for STEMI without any suspicion of inflammatory etiology. Nevertheless, 80% of the 100 reported cases were linked to stent implantation [2, 3]. While coronary aneurysms may be asymptomatic, some patients (especially those with giant aneurysms) may present with hemodynamic abnormalities due to the turbulence and slowing of the blood flow (as in our case). They may also cause various types of ischemic heart disease such as effort angina or acute coronary syndrome. Thrombosis in the lumen of large aneurysms may lead to distal embolization and myocardial infarction, and massive enlargement can result in the compression of adjacent structures [4]. Aneurysm rupture can lead to acute cardiac tamponade [4]. Treatment options for giant aneurysms include a conservative approach, cardiac surgery (aneurysm ligation, resection, bypass grafting), and percutaneous interventions (covered stent, coil, stent-assisted

coiling). The strategy depends on the patient's condition (ongoing vs previous inflammation) and aneurysm anatomy [1–5].

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska.

Article information

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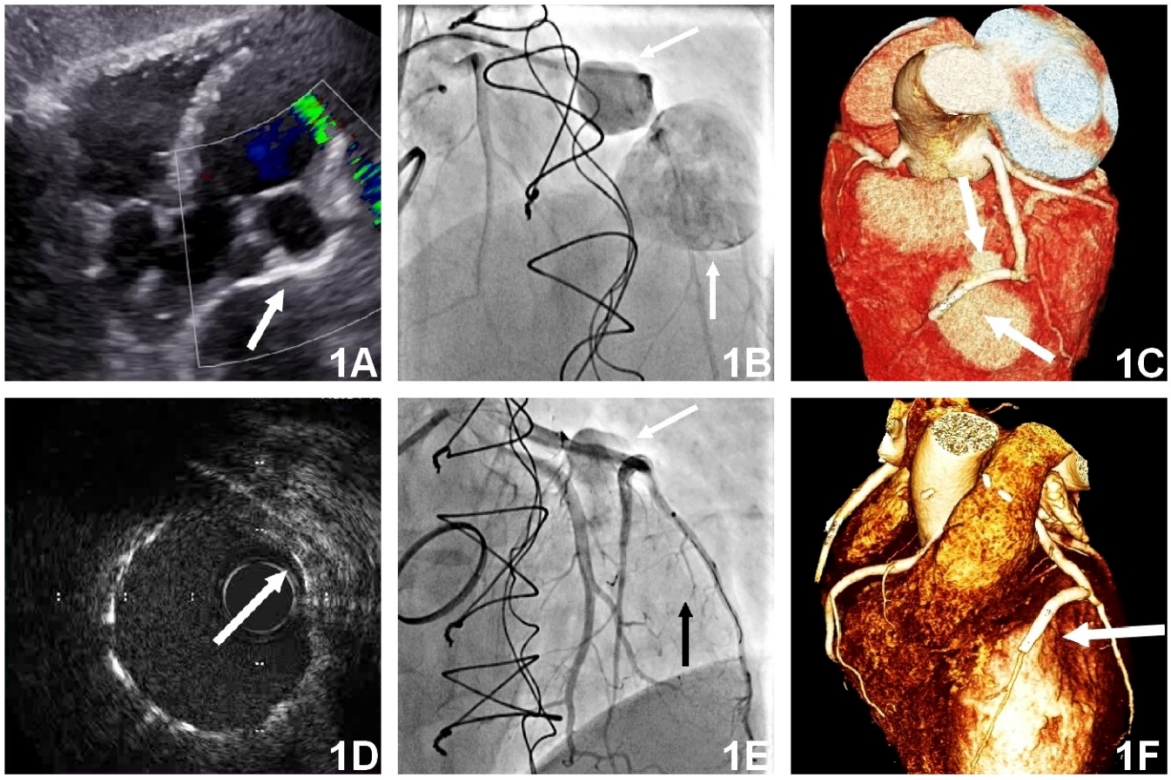

Figure 1. A. An additional chamber on echocardiography (white arrow). **B.** Aneurysms of the left anterior descending artery (LAD) on angiography (white arrows). **C.** Aneurysms of the LAD on computed tomography (white arrows). **D.** Aneurysms on intravascular ultrasound (a floating stent in the aneurysm, connection between the vessel and stent walls — white arrow). **E.** The LAD after the covered stent procedure (the first aneurysm with the remaining contrast material – white arrow; the second aneurysm not visible — black arrow). **F.** Follow-up computed tomography at 3 months after the covered stent procedure; no signs of the additional chambers (white arrow)