Marked Malapposition and Aneurysm Formation After Sirolimus-Eluting Coronary Stent Implantation

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A 52-year-old female presented with an acute coronary syndrome, anterior T wave inversions, and elevated cardiac markers. After cardiac catheterization, a critical mid-left anterior descending artery (LAD) stenosis involving the origin of the second diagonal branch and a critical mid-right stenosis were observed. It was felt that the “culprit” vessel was the LAD, and a successful angioplasty was performed with a drug-eluting stent (DES), Cypher (Cordis), placed in the LAD and the diagonal branch dilated with a balloon. The right coronary artery (RCA) was treated with a drug-eluting stent 3 days later (Figure 1a and 1b). The patient was discharged the following day.

Seven months later, she presented to the emergency room with chest pain. A thallium stress test demonstrated anterior ischemia. Angiography revealed ectatic areas around the drug-eluting stents in both the LAD (Figure 2a and 2b) and the RCA (Figure 1c and 1d), with proximal LAD stent stenosis. Intravascular ultrasound (IVUS) assessment demonstrated a pattern of late stent malapposition in both the LAD and RCA (Figure 1d and Figure 2b). Cardiac computed tomography confirmed a 20-mm long aneurysmal dilation in the LAD with a prominent distance between the stent struts and the vessel wall (Figure 2c and 2d). At this time, the patient underwent percutaneous transluminal coronary angioplasty of the proximal edge stenosis with a bare metal stent and will be closely followed up with repeat angiography and IVUS to assess the potential progression of the aneurysms.

The simultaneous occurrence of aneurysmal dilation and incomplete apposition at both drug-eluting stent sites may suggest a patient-specific sensitivity to rapamycin. Because of the lack of information regarding the causes of subacute occlusion in drug-eluting stent and the exponential increase in the use of these devices during percutaneous coronary intervention, the possibility of individual hypersensitivity to eluting drugs should be further investigated.
Figure 1. Angiographic (a) and IVUS (b) pictures of the right coronary artery immediately after Cypher implantation. The stented segment at baseline is shown at higher magnification. Angiographic (c) and IVUS (d) pictures of the right coronary artery at follow-up (7 months). The stented segment at baseline is shown at higher magnification. IVUS picture shows evident late stent malapposition. White arrows indicate lacunar spaces beyond the stent struts, in which blood flow is evident (d).

Figure 2. a. Angiographic picture of the left coronary artery at 7 months after Cypher implantation. A clearly aneurysmal segment can be observed at the stented site (higher magnification). b. IVUS image showing late stent malapposition in the left coronary artery and blood flow between the stent struts and the vessel wall (white arrows). c, Cardiac computed tomography image showing the aneurysmal segment of the left coronary artery (white arrow). d, Cross sectional computed tomography section showing the distance between the stent struts and the vessel wall (white arrow).
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