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Catastrophic Thrombus Formation During Optical Coherence Tomography

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A 71-year-old patient underwent follow-up coronary angiography to assess the patency of a left anterior descending (LAD) artery stent. Seven months previously, she had received percutaneous coronary intervention at the LAD because of anterior wall ST-elevation myocardial infarction. At that time, 2 drug-eluting stents (Cypher 3.0×28 mm and Cypher 2.75×28 mm) were inserted at the proximal and distal LAD. After percutaneous coronary intervention, she had taken 100 mg of aspirin, 75 mg of clopidogrel, and 200 mg of cilostazol daily. Coronary angiography at 7 months follow-up was performed as part of the protocol for the optical coherence tomography (OCT) registry. The follow-up coronary angiography revealed patent stents implanted in the LAD (Figure 1A). We also performed intravascular ultrasound (IVUS) and OCT to evaluate neointimal coverage of the drug-eluting stents. IVUS revealed that the stents were partially covered with neointima without any evidence of thrombus during IVUS imaging (online-only Data Supplement Movie I). Subsequently, we performed OCT, which clearly illustrated partial neointimal coverage of stent struts. But during the OCT procedure, multiple thrombi formation were observed (Figure 2 and online-only Data Supplement Movie II). Coronary angiography immediately after OCT revealed thrombotic total occlusion of the distal LAD (Figure 1B and online-only Data Supplement Movie III). Therefore we immediately performed thrombi suction with a Thrombuster catheter (Kaneka Medics, Osaka, Japan). However, the thrombi were not completely cleared, with only partial recovery of the distal flow (online-only Data Supplement Movie IV). Fortunately, no significant deterioration occurred in the ECG or in the patient's condition after the procedure. The patient recovered uneventfully.

OCT is an in vivo light-based imaging modality for evaluating the coronary artery microstructure.¹ Because the resolution of OCT imaging is higher than that of IVUS, its application in research is expanding.^{2,3} In particular, attempts to detect vulnerable plaques in vivo with OCT imaging and studies of the delicate interaction between vessel wall and stent strut, as well as of neointima growth, are actively ongoing.^{3,4}

Unlike IVUS, however, OCT has a limitation in that it needs to create a blood-free zone. Therefore, balloon occlusion of the proximal vasculature for as long as 30 to 40 seconds is required.¹ This limitation can provoke myocardial ischemia during the procedure and, in rare situations, intracoronary thrombus formation as demonstrated in this case.

Disclosures

None.

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The online-only Data supplement, which consists of movies, is available with this article at <http://circ.ahajournals.org/cgi/content/full/118/6/e101/DC1>.

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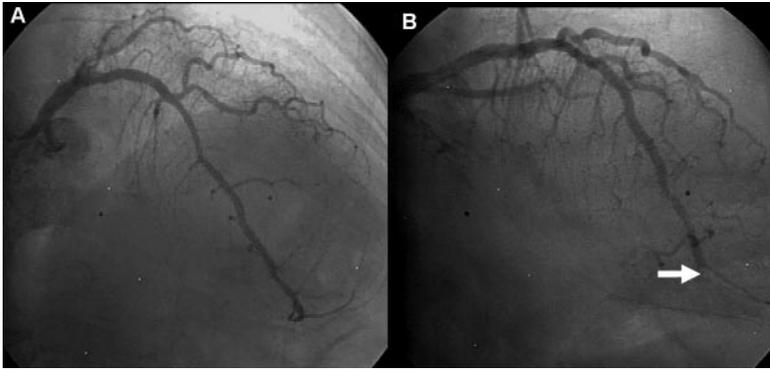


Figure 1. A, Follow-up coronary angiography revealed patent stents previously inserted at proximal and distal LAD artery. B, After OCT imaging, total occlusion of distal LAD was observed on coronary angiography (arrow).

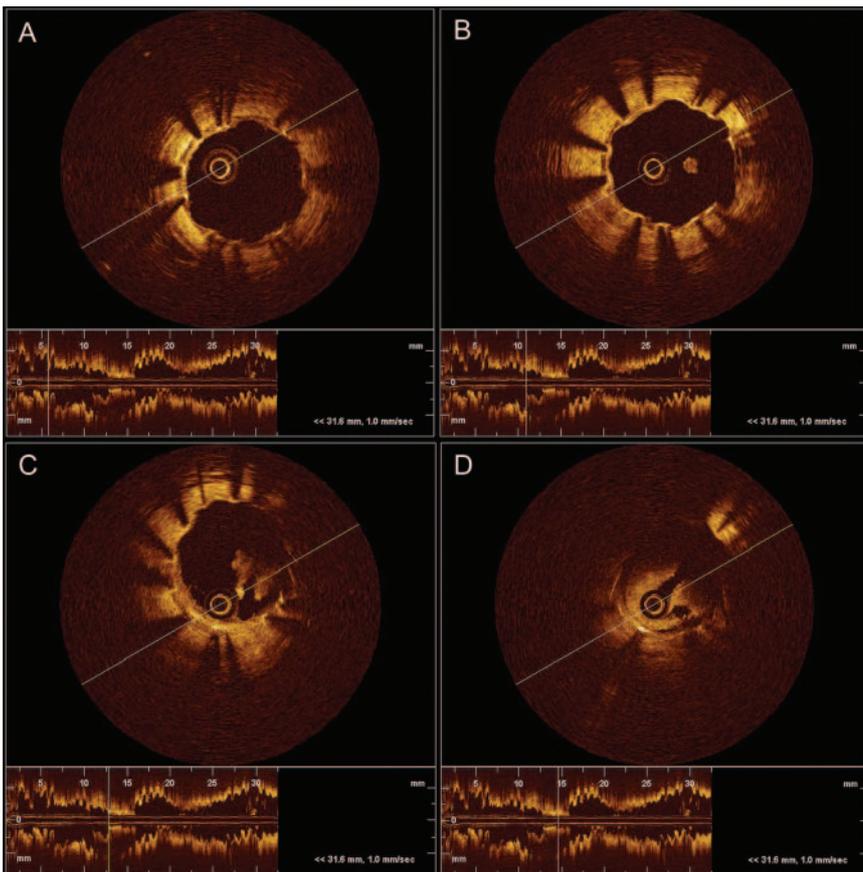


Figure 2. New thrombi were detected during evaluation of the distal stent with OCT.