

IMAGES IN INTERVENTION

Very Late Stent Thrombosis 5 Years After Implantation of a Sirolimus-Eluting Stent Observed by Angioscopy and Optical Coherence Tomography

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Drug-eluting stents have dramatically reduced the rate of in-stent restenosis (1). However, very late stent thrombosis (VLST) is one of the clinical

issues with regard to the safety of drug-eluting stents (2,3). To date there are no articles that report VLST evaluated by both angioscopy and

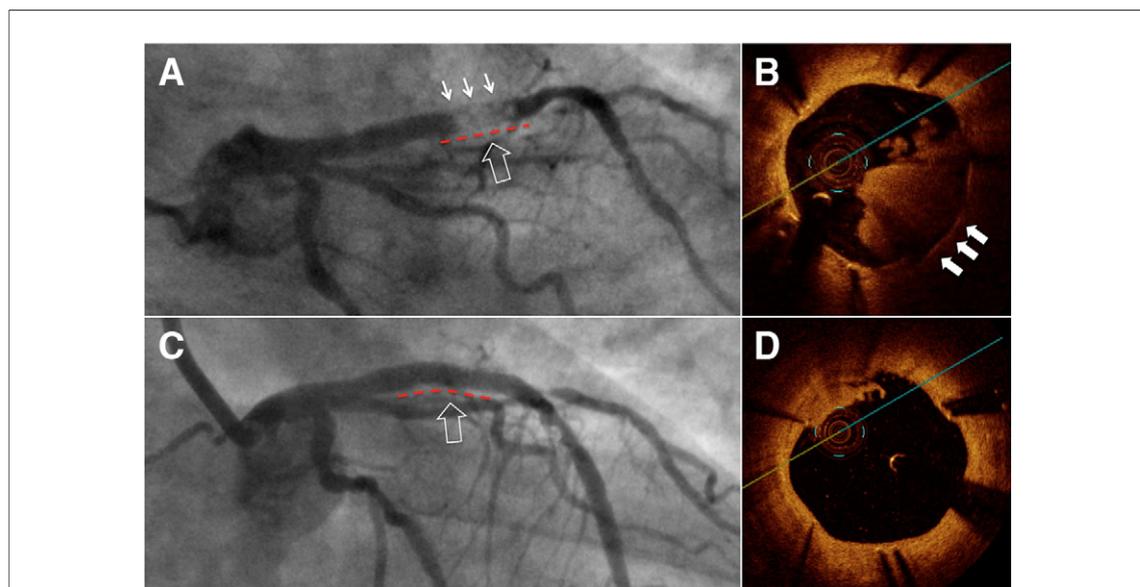


Figure 1. Images of Coronary Angiography and OCT of Pre- and Post-Percutaneous Coronary Intervention

(A) Initial coronary angiography demonstrated severe stenosis with a contrast filling defect in the sirolimus-eluting stent (SES) implantation site of the left anterior descending artery (small arrows). Dashed red line shows SES implantation site. **(B)** Optical coherence tomography (OCT) revealed massive thrombus in the SES (solid arrows) at the site of the open arrow. **(C)** Vessel patency was restored after aspiration procedure. Dashed red line shows SES implantation site. **(D)** The OCT image demonstrated restored vessel patency at the site of the open arrow.

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optical coherence tomography (OCT). A 50-year-old man presented to the emergency department with chest pain. Five years earlier a 3.0×13 mm sirolimus-eluting stent (SES) was implanted in the left anterior descending artery. Coronary angiography revealed severe stenosis with a contrast filling defect at the SES site (Fig. 1A) that was attributed to

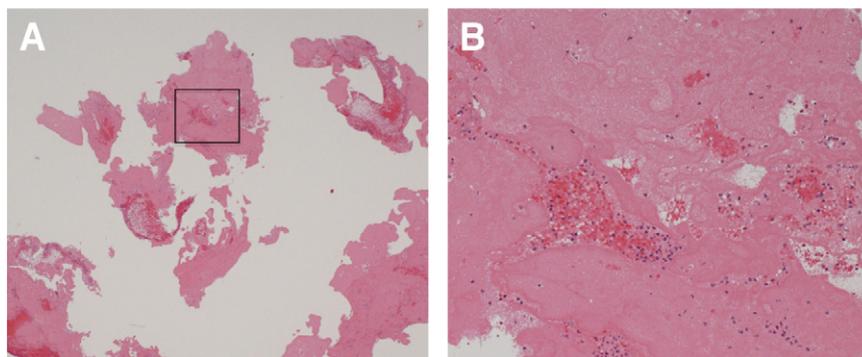


Figure 2. Histopathology of Aspirated Materials

Aspirated materials contained fresh red and white thrombus. Plaque debris and eosinophils were not present. Hematoxylin and eosin stain; original magnification: (A) 20 \times ; (B) 100 \times .

VLST. The OCT demonstrated the presence of massive thrombus (Fig. 1B). Thrombus aspiration resulted in disappearance of filling defect (Fig. 1C). The OCT demonstrated dramatic reduction of the thrombus (Fig. 1D). On pathological evaluation the aspirated contents contained thrombi but no plaque or eosinophil (Fig. 2). Coronary angiography 12 days after the procedure revealed patency of SES without peri-stent contrast staining (Fig. 3A). Angioscopic observation showed presence of fully visible struts with red thrombus (Fig. 3B, Online Video 1). The OCT

also revealed uncovered struts (Fig. 3C). It has been reported that the main cause of early stent thrombosis is usually a procedure-related issue, whereas that of late stent thrombosis is delayed arterial healing, and that of VLST is an abnormal vascular response (4). However, an abnormal vascular response was thought to be less relevant as a cause of VLST in this case, because strut malapposition was not severe, and the material aspirated from the strut did not contain eosinophils. In contrast, judging from the fully visible struts observed by angioscopy without neointima

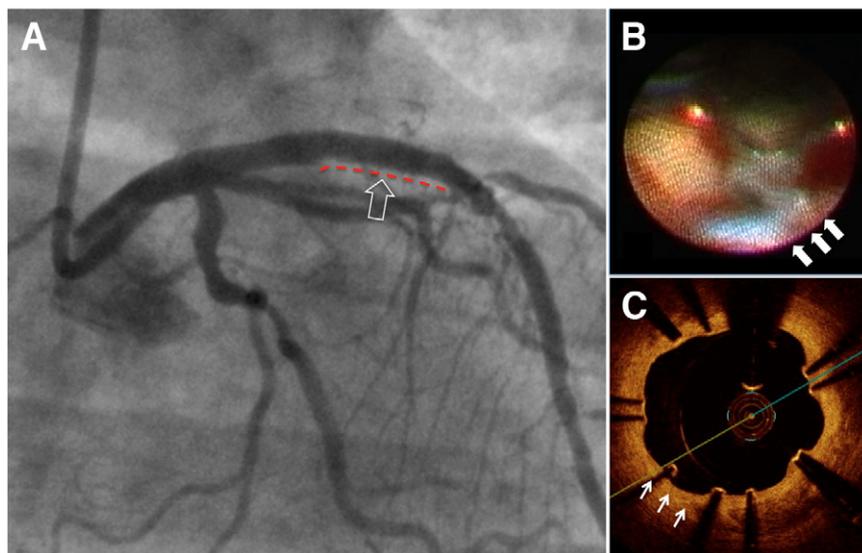


Figure 3. Images of Coronary Angiography, Angioscopy, and OCT 12 Days After Initial Procedure

(A) Follow-up coronary angiography revealed patency without peri-stent contrast staining or presence of a thrombotic filling defect. Dashed red line shows sirolimus-eluting stent (SES). (B) Angioscopic evaluation demonstrated fully visible struts with red thrombus and yellow plaques at the site of the open arrow in A (large arrows). (C) Optical coherence tomographic (OCT) evaluation demonstrated uncovered struts and malapposition at the site of the open arrow in A. Maximum interval between stent strut and vessel was 240 μm (small arrows) (Online Video 1).

formation and the presence of uncovered struts observed by OCT, delayed arterial healing was thought to be the main cause of VLST in this case.

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Key Words: angioscopy ■ optical coherence tomography ■ sirolimus-eluting stent ■ very late stent thrombosis.