

IMAGES IN INTERVENTION

An Unusual Case of Stent-in-Stent Thrombosis



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A 71-year-old man was admitted for acute coronary syndrome. Six weeks earlier, he had a Promus Premier 3.0 × 12-mm (Boston Scientific, Natick, Massachusetts) drug-eluting stent (DES) implanted in the obtuse marginal (OM) artery for unstable angina. On repeat coronary angiography, haziness (Figure 1A, Online Video 1) in the ostial stented region was observed; however Thrombolysis In Myocardial Infarction flow grade was good. Optical coherence tomography (OCT) revealed a nonexpanded stent (star with struts marked with +) within and protruding out of the deployed stent. The deployed stent appeared well expanded and apposed to the vessel wall (deployed stent with struts marked with asterisk [Figures 1C and 1D, Online Video 2]). There was lumen compromise secondary to a large amount of thrombus formation seen around the nonexpanded stent struts together with incomplete lesion coverage proximally. Attempts to rewire or retrieve the nonexpanded stent were unsuccessful. On the basis of the OCT findings, the decision was made to crush the nonexpanded stent and to deploy a Promus Premier 3.5 × 12-mm DES proximally with good results (angiography shown in Figure 1B, Online Video 3). Multiple layers of struts (OCT) (white arrows in Figure 1, D-3; Online Video 4) from the 2 overlapping deployed stents as well as the previously nonexpanded stent can be seen in Figures 1D and 1E. Figure 1F shows the 3-dimensional reconstruction (QAngioOCT software, Medis Specials,

Leiden, the Netherlands) of the vessel pre- and post-procedure showing the crushed stent in stent.

We describe a rare cause of stent thrombosis, emphasizing that mechanical stent-related causes should always be ruled out, especially if stent thrombosis occurs soon after implantation. In our case, a nonexpanded stent formed the nidus of thrombus formation. The nonexpanded stent was likely due to loss or embolization during attempts at device delivery in a challenging procedure due to significant calcification, severe tortuosity, and suboptimal guide catheter backup. Of note, this complication was previously undetected on angiography. This is a rare case of stent-in-stent thrombosis in which OCT demonstrates the potential to improve clinical diagnosis and procedural outcome.

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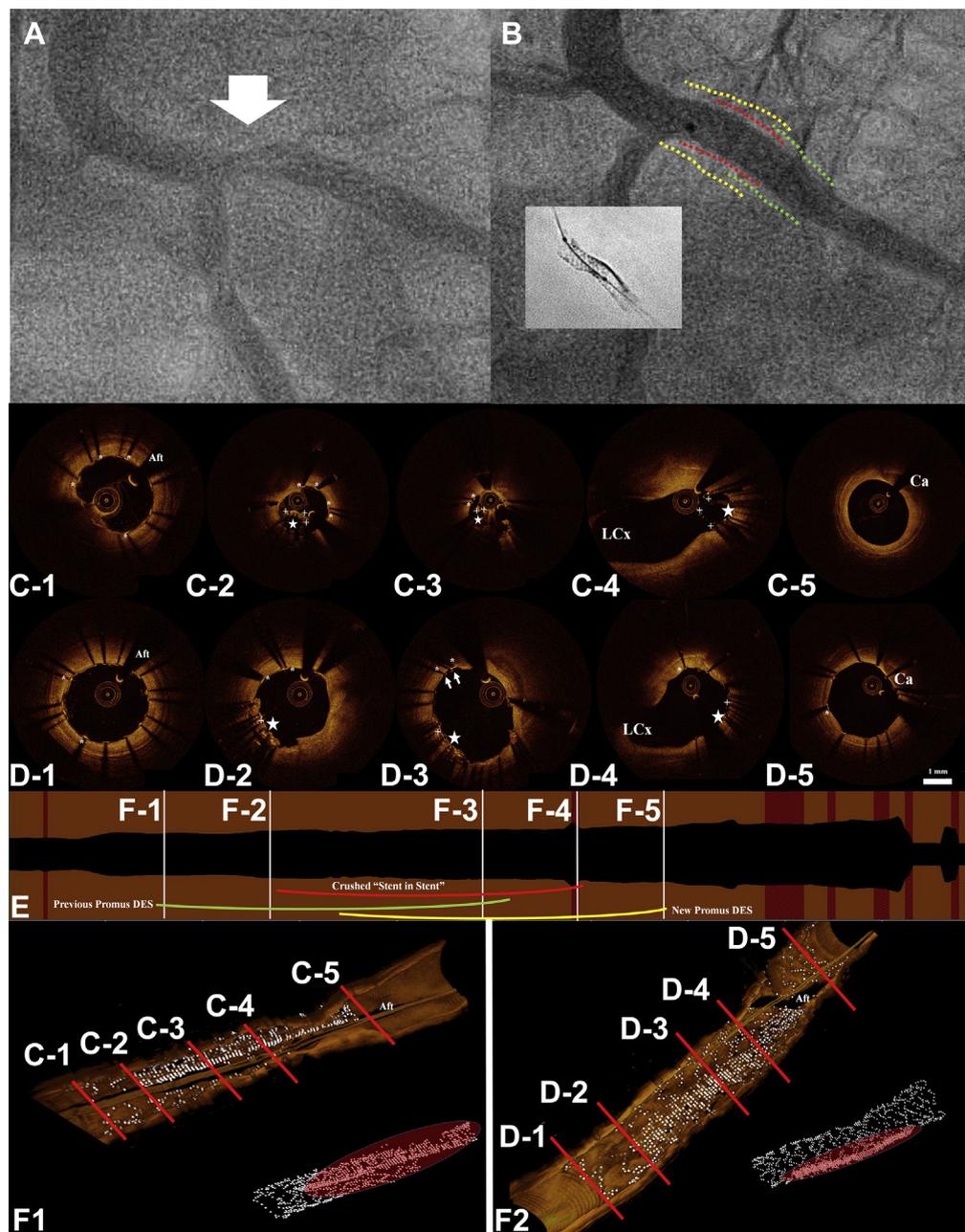
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APPENDIX For supplemental videos, please see the online version of this article.

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FIGURE 1 Angiographic and OCT Images of the OM Artery With Stent-in-Stent Thrombosis

(A) Angiographic haziness (white arrow, [Online Video 1](#)) seen in the ostial segment of the OM artery that was stented (Promus Premier 3.0 × 12 mm, Boston Scientific) 6 weeks earlier. **(B)** Angiogram ([Online Video 3](#)) after deployment of a new stent (Promus Premier 3.5 × 12 mm). **(Inset)** Fluoroscopic image of the overlapping stents. **(C)** OCT of the OM/LCx arteries before Promus Premier 3.5 × 12-mm stent deployment. The previously deployed Promus Premier 3.0 × 12-mm stent (**C-1-C-3**; struts marked with asterisks, [Online Video 2](#)) appeared well expanded and apposed to the vessel wall. A nonexpanded stent (**C-2-C-4**; star with struts marked with +) could be seen within the deployed stent. There was lumen compromise secondary to a large amount of thrombus formation seen around the nonexpanded stent struts (**C-3**). The nonexpanded stent protruded out of the deployed stent and could be seen at the bifurcation (**C-4**) of the OM and the LCx (**C-5**) arteries. **(D)** Corresponding OCT done post-deployment of new Promus 3.5 × 12 mm DES. Multiple layers of struts (**D-3**, white arrows, [Online Video 4](#)) from the 2 overlapping deployed stents as well as the previously unexpanded stent (star) can be seen. **(E)** The lumen profile of the OM artery as seen by OCT after deployment of the Promus Premier 3.5 × 12-mm stent showing the relationship between the nonexpanded and deployed stents. **(F)** The 3-dimensional reconstruction (QAngioOCT software; Medis Specials, Leiden, the Netherlands) of the vessel pre- (**F1**) and post- (**F2**) procedure showing the crushed stent in stent. Aft = artifact caused by guidewire; Ca = calcium; DES = drug-eluting stent(s); LCx = left circumflex artery; OCT = optical coherence tomography; OM = obtuse marginal.