

## MINI-FOCUS ISSUE: INTERVENTIONAL CARDIOLOGY AND CORONARY PATHOLOGIES

INTERMEDIATE

### IMAGING VIGNETTE: CLINICAL VIGNETTE

# Coronary Artery Occlusion Caused by Intramural Hematoma Due to In-Stent Dissection



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#### ABSTRACT

A 54-year-old man developed ST-segment elevation myocardial infarction 1 week after percutaneous coronary intervention of the left anterior descending artery. Optical coherence tomography at the emergent percutaneous coronary intervention revealed an intramural hematoma extending from the in-stent dissection. We highlight that in-stent dissection, although generally considered a benign finding, can extend and cause intramural hematoma, resulting in coronary artery occlusion. (**Level of Difficulty: Intermediate.**) (J Am Coll Cardiol Case Rep 2020;2:707-8) © 2020 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

A 54-year-old man with previously known coronary artery disease and percutaneous coronary intervention (PCI) of the distal left anterior descending artery (LAD) 4 years ago underwent invasive coronary angiography because of non-ST-segment elevation myocardial infarction. The coronary angiography revealed a de novo high-grade stenosis of the proximal LAD (Video 1), which was treated in an optical coherence tomography (OCT)-guided PCI with a cobalt-chromium everolimus-eluting stent (3.5 × 33 mm). According to pre-PCI OCT measurements, post-dilatation with a noncompliant balloon (4.5 mm, 20 atm) for the proximal stent segment and kissing balloon technique for LAD (3.5 mm) and the diagonal branch (2.0 mm) were performed. Final angiography and OCT revealed an optimal stent expansion (≈95%) and apposition with a minor in-stent dissection (Figures 1A and 1B, Videos 2 and 3) but neither dissection/hematoma at the diagonal ostium nor distal stent edge (Figures 1C to 1E).

The minor in-stent dissection was decided to be managed conservatively without additional post-dilatation during the index intervention. The patient was discharged the following day under dual antiplatelet therapy with aspirin 100 mg daily and prasugrel 10 mg daily. He was normotensive during the initial hospitalization under long-term antihypertensive therapy with an angiotensin-converting enzyme inhibitor. One week after the index PCI, the patient was urgently admitted to the hospital because of acute chest pain. The electrocardiogram showed ST-segment elevations in anterior leads. Emergent coronary angiography showed a subtotal occlusion distal to the recently implanted stent (Figure 1F, Video 4). After pre-dilatation of the occluded

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**ABBREVIATIONS  
AND ACRONYMS**

**LAD** = left anterior descending artery

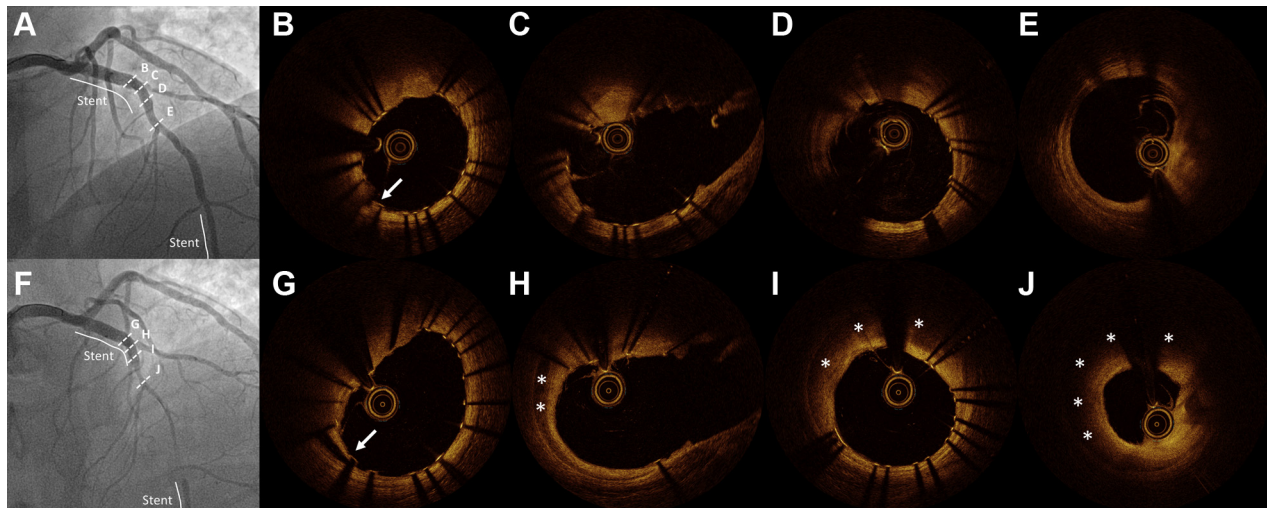
**OCT** = optical coherence tomography

**PCI** = percutaneous coronary intervention

segment with a 2.0-mm balloon, OCT revealed an intramural hematoma (Figures 1H to 1J, Supplemental Figure 1, Video 5) extending from the in-stent dissection (Figure 1G) to the stent implanted 4 years ago. The in-stent dissection was now more pronounced compared with observations made at the index PCI. No other dissections in the mid-LAD between the 2 stents were detected, which could have been the trigger for the intramural hematoma. These findings suggest that the in-stent dissection extended to the stent distal and caused intramural hematoma, leading to coronary artery occlusion. The coronary flow was completely restored after implantation of an additional drug-eluting stent (2.75 × 48 mm) overlapping the 2 previously implanted stents in the proximal and distal LADs (Video 6).

Although in-stent dissection is generally considered a benign complication after PCI (1,2), operators should note that in-stent dissection can extend to the distal segment and cause intramural hematoma in a subacute setting, resulting in coronary artery occlusion (3). Nevertheless, it is challenging to associate in-stent dissection with hematoma at the time of PCI if no hematoma can be identified. High-pressure post-dilatation aiming to compress the in-stent dissection should be considered. Further investigations are needed to better understand the mechanism and management of this rare but critical condition.

**FIGURE 1** Coronary Angiography and OCT Findings



(A) Angiography after stent implantation (3.5 × 33 mm) to the proximal left anterior descending artery. Optical coherence tomography (OCT) showed the minor in-stent dissection (B, white arrow) but neither dissection/hematoma at the diagonal ostium (C) nor distal stent edge (D and E). (F) Angiography 1 week after the index percutaneous coronary intervention showed subtotal occlusion distal to the implanted stent. (G) In-stent dissection (white arrow) was more pronounced compared with that observed at the index percutaneous coronary intervention (B). (H and I) Hematoma (asterisk) was confirmed around in-stent dissection. (J) Circumferential hematoma (asterisk) causing significant luminal stenosis.

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**KEY WORDS** acute myocardial infarction, dissection, intramural hematoma, optical coherence tomography, percutaneous coronary intervention

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