

IMAGES IN INTERVENTION

Intramural Hematoma Appearing as a New Lesion After Coronary Stenting

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A 51-year-old man with hypertension and hyperlipidemia presented with exertional chest pain and underwent a stress echocardiogram that showed anterior and lateral ischemia. Coronary angiography revealed a 70% stenosis of the mid left circumflex artery and an 80% stenosis of the proximal left anterior descending artery (Fig. 1A). The left circumflex artery was directly stented with a 2.5×12 -mm drug-eluting stent (DES). The left anterior descending artery stenosis was pre-dilated with a 3.0×9 mm balloon, and a 3.5×16 mm DES was placed, with a maximal inflation pressure of 16 atm. After stent placement, there appeared to be a

“new lesion” at the distal end of the stent (Fig. 1B). The angiographic abnormality was not relieved by intracoronary nitroglycerin or verapamil. The patient remained hemodynamically stable without electrocardiographic changes or chest pain.

To determine the etiology of this new lesion, intravascular ultrasound was used. This revealed an intramural hematoma originating at the distal end of the stent (Fig. 2). There was no identifiable entry point. The intramural hematoma was treated with an overlapping 3.0×20 mm DES deployed at a maximal pressure of 12 atm. The stent length was chosen to cover beyond the distal extent of

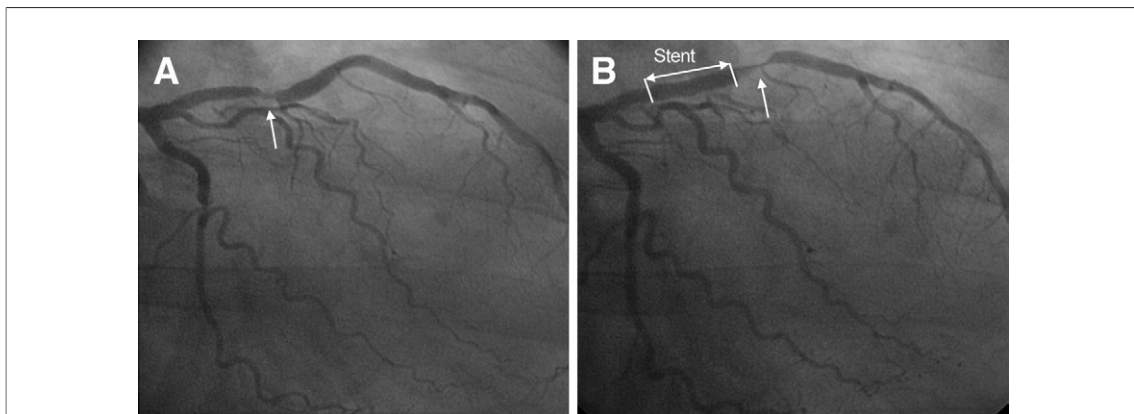


Figure 1. Left Coronary Artery Angiogram Before and After Stenting

(A) Angiography of the left coronary artery demonstrating the original stenosis in the proximal left anterior descending artery (arrow). (B) Angiography of the left anterior descending artery after stent implantation showing a new luminal narrowing just distal to the stent (arrow).

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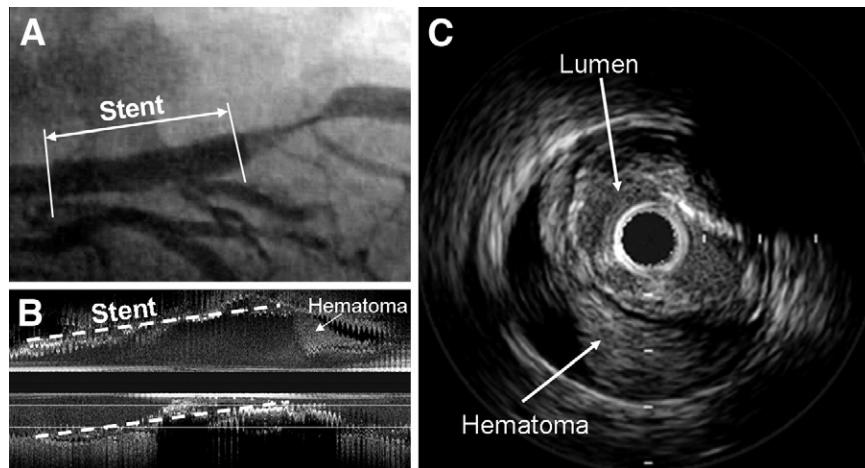


Figure 2. Intravascular Ultrasound of New Lesion Appearing at Distal End of Stent

(A) Angiography of the left anterior descending artery demonstrating a new luminal narrowing just distal to the stent. (B) Longitudinal intravascular ultrasound image of the artery segment seen in A. The white dotted line outlines the stent, and the white arrow indicates the hematoma, which occupied much of the lumen of the distal reference segment. (C) Intramural hematoma seen in the cross-sectional intravascular ultrasound image at the site of luminal narrowing in A.

the intramural hematoma. Final intravascular ultrasound showed resolution of the intramural hematoma, and angiography demonstrated no residual stenosis and Thrombolysis In Myocardial Infarction flow grade 3. The creatinine kinase-myocardial band the following morning was normal.

Intramural hematomas after percutaneous coronary intervention are defined as an accumulation of blood within the media that displaces the internal elastic membrane inward and the external elastic membrane outward, with or without identifiable entry and exit points (1). They have been demonstrated in up to 7% of all percutaneous coronary interventions and are most common in diabetic patients and those with less-diseased coronary arteries. The angiographic appearance of an intramural hematoma is generally a dissection (60% of cases), but in 11% it appears as spasm or a “new lesion,” and in 29% there is no significant angiographic abnormality. Intramural hematomas can occur at both the distal (55%) and proximal stent edges (45%). Up to 26% are complicated by a non-Q-wave myocardial infarction. The

proper management of intramural hematomas remains poorly defined (2).

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REFERENCES

1. Mintz GS, Nissen SE, Anderson WD, et al. American College of Cardiology clinical expert consensus document on standards for acquisition, measurement, and reporting of intravascular ultrasound studies (IVUS): a report of the American College of Cardiology task force on clinical expert consensus documents. *J Am Coll Cardiol* 2001;37:1478-92.
2. Maehara A, Mintz GS, Bui AB, et al. Incidence, morphology, angiographic findings, and outcomes of intramural hematomas after percutaneous coronary interventions: an intravascular ultrasound study. *Circulation* 2002;105:2037-42.