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IMAGES IN INTERVENTION

An Unusual Complication After Bioresorbable Scaffold Implantation

Visualization of Intramural Hematoma by Optical Coherence Tomography

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A 68-year-old man was treated in our catheterization laboratory for ST-segment elevation myocardial infarction. He had undergone 3.5 × 18-mm bioresorbable vascular scaffold (BVS) implantation in the proximal left anterior descending coronary artery for stable angina in another institution 2 days before.

At presentation, angiography showed a filling defect located >5 mm distally to the scaffolded segment (**Figure 1A**). An attempt at thrombus aspiration was performed, without retrieving any aspiration material, and the angiographic image remained unchanged (**Figure 1B**). Optical coherence tomography (OCT) was performed and revealed the absence of intraluminal thrombus, but the presence of an occlusive intramural hematoma, extending from the edge of the implanted BVS until distal to the second diagonal branch (**Figure 2**). The patient was treated with 2 additional BVS (3.5 × 23 mm and 2.5 × 12 mm) that covered the region of the intramural hematoma (**Figure 1C**). An extension of the dissection in the second diagonal branch was noted, which was treated conservatively in view of the Thrombolysis In Myocardial Infarction flow grade 3 and its small size.

Post-hoc revision of the baseline implantation (**Figures 1D to 1F**) revealed incomplete coverage of the segment subjected to pre-dilation. At that time, no distal edge dissection was visible at the final angiogram, only a mild stenosis of the distal edge.

BVS are a new treatment for obstructive coronary artery disease that could alleviate long-term metal stent complications (1). However, because of intrinsic differences in design, more aggressive lesion preparation is required, which could lead to a higher incidence of incomplete lesion coverage (2). In our case, OCT clearly identified an occlusive intramural hematoma as a pathomechanism for a recurrent event after BVS implantation. The use of intravascular imaging at baseline implantation could have led to early recognition and prevention of this complication.

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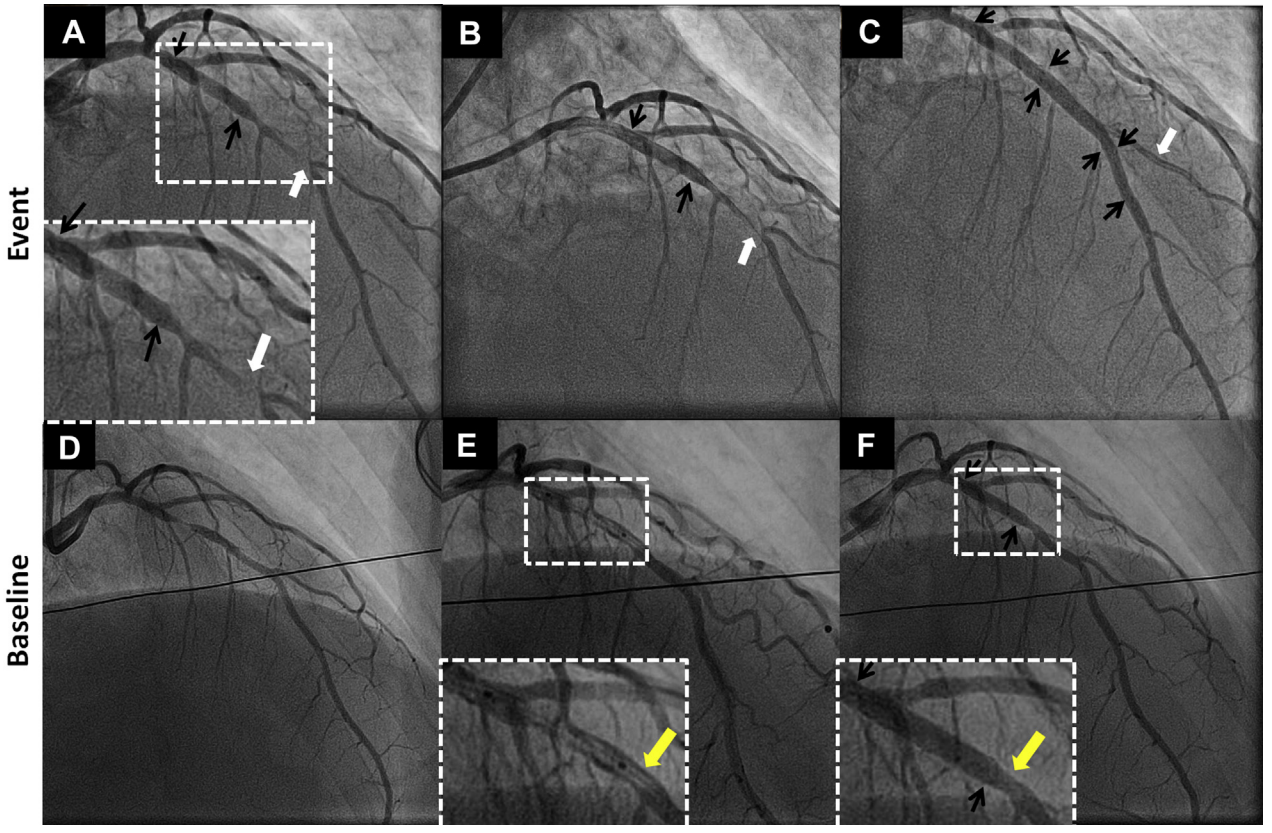
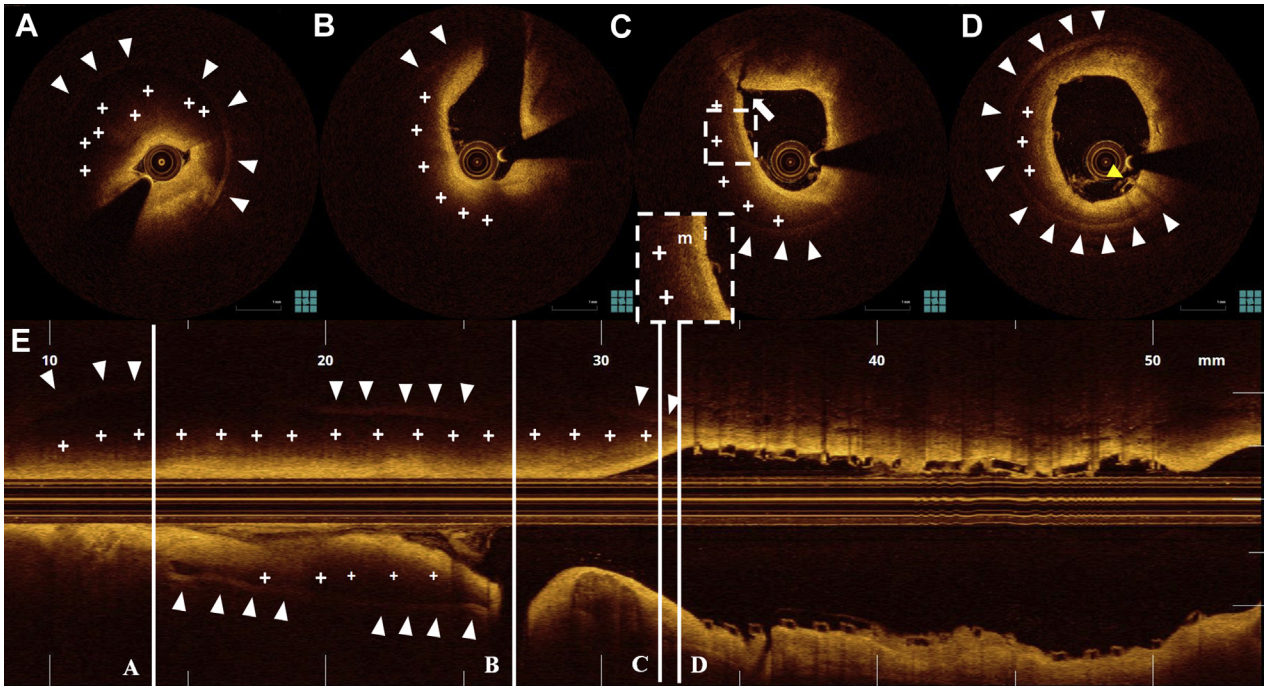
FIGURE 1 Coronary Angiogram at the Event and at Baseline Implantation



Angiogram at the time of the event pre-treatment **(A)**, after thrombus aspiration **(B)**, and after additional bioresorbable vascular scaffold (BVS) implantation **(C)**. **Black arrows** indicate scaffold markers. The **white arrow** indicates the contrast deficit **(A and B)**, and the extension of the dissection to the diagonal branch **(C)**. Angiogram at baseline procedure pre-treatment **(D)**, during BVS positioning **(E)**, and after BVS implantation **(F)**. **Yellow arrow** demonstrates the dissection flap that remained distal to the implanted scaffold, resulting in a mild stenosis of the distal edge. The **insets in A, E, and F** are higher magnifications of the **boxed areas** in the respective panels.

FIGURE 2 **Cross-Sectional and L-Mode OCT Images of the Intramural Hematoma**



Formation of an intramural hematoma displacing the intima and the media towards the lumen. The hematoma begins at the distal edge of the scaffold **(D)**, whereas an entry point **(arrow)** is visualized in short distance **(C)**, extends beyond the septal branch **(B)**, and is near-occlusive at the distal part **(A)**. The **inset in C** is a higher magnification of the **boxed area**. **(E)** L-mode OCT demonstrating the locations of the cross sections in **A to D** are shown. The **crosses** indicate hematoma; the **white arrowheads**, the adventitial contour; and the **yellow arrowhead**, the scaffold strut **(D)**. i = intima; m = media; OCT = optical coherence tomography.

REFERENCES

1. Karanasos A, Simsek C, Gnanadesigan M, et al. OCT assessment of the long-term vascular healing response 5 years after everolimus-eluting bioresorbable vascular scaffold. J Am Coll Cardiol 2014;64:2343–56.

2. Longo G, Granata F, Capodanno D, et al. Anatomical features and management of bioresorbable vascular scaffolds failure: a case series from the GHOST registry. Catheter Cardiovasc Interv 2015;85:1150–61.

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