

The Invisible Revealed: The Importance of IVUS in Diagnosing and Treating a Coronary Wire Complication

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A 72-year-old male underwent elective percutaneous coronary intervention (PCI) for a significant stenotic lesion in the left anterior descending (LAD) artery (Figure 1 white arrow, Video 1).



Figure 1. Angiographic image showing stenotic lesion (black arrow) in the left anterior descending (LAD) coronary artery.

A wire was placed in the diagonal branch prophylactically to preserve side branch patency during main vessel stenting. After successful deployment of a drug-eluting stent (DES) in the LAD, the side branch wire was withdrawn.

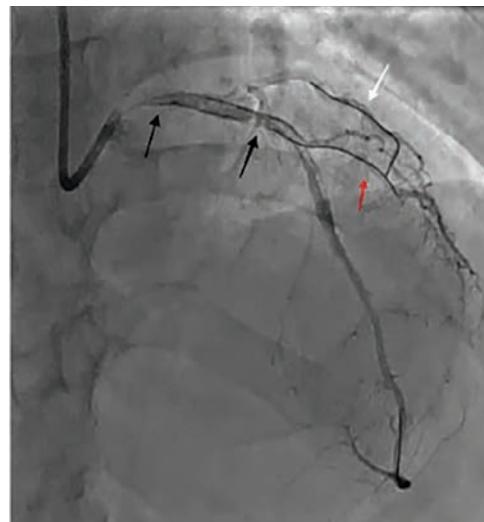


Figure 2. Fractured wire entrapped behind stent struts (black arrow). Retained wire fragment visualized in diagonal branch (red arrow). A supportive parallel wire in the left circumflex (LCX) (white arrow).

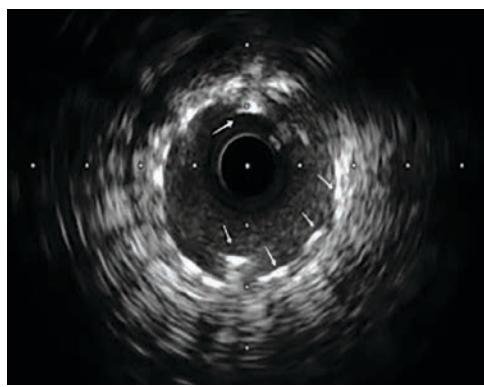


Figure 3A. Intravascular ultrasound (IVUS) showing wire loop near proximal LAD (white arrows).

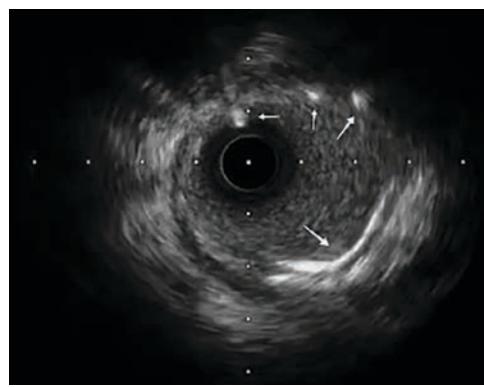


Figure 3B. IVUS showing wire loops in left main (LM) proximal to stent edge (white arrows).

However, a radiopaque segment remained within the side branch, while the remaining wire fractured and became entrapped behind the stent struts (Figure 2 [black arrows], Video 2).

A coronary snare was used to retrieve the proximal segment of the retained wire. Partial extraction was achieved, but tangled wire fragments remained lodged in the proximal LAD. To stabilize these remnants, an additional DES was deployed to pin the wire against the vessel wall. Although angiography initially appeared satisfactory, intravascular ultrasound (OptiCross, Boston Scientific) proved pivotal by revealing that the wire loops had coiled within the stent, extended retrogradely into the proximal LAD, and reentered the stented segment near the left main stem (LMS) (Figures 2 [red arrow], 3A-C, Video 3).

Due to persistent slow distal flow and increased thrombotic risk, a repeat snaring attempt was unsuccessful (Video 4).

A second DES (Resolute Onyx, Medtronic) was then deployed from the proximal LAD into the LMS, effectively jailing the wire fragments. IVUS assessment was performed from the ostial LAD (Figure 4A-C, Video 5).

Final angiography confirmed TIMI-3 flow with no dissection, perforation, or distal embolization; the wire in the side branch remained in place at the end of the procedure (Figures 2 [white arrow], 4A-C, 5, Video 6).

Follow-up

The angioplasty was performed in October 2022. The patient remained hemodynamically

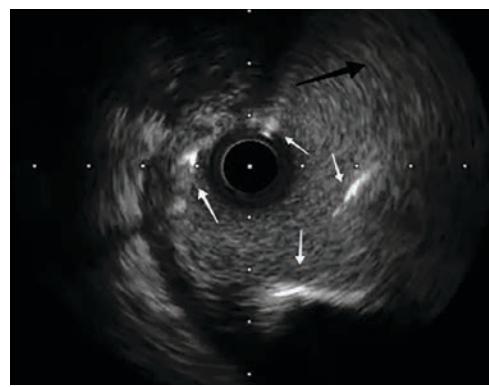


Figure 3C. IVUS showing retrograde extension of wire into the left main stem (LMS) (white arrows). Aorta can be seen at the black arrow.

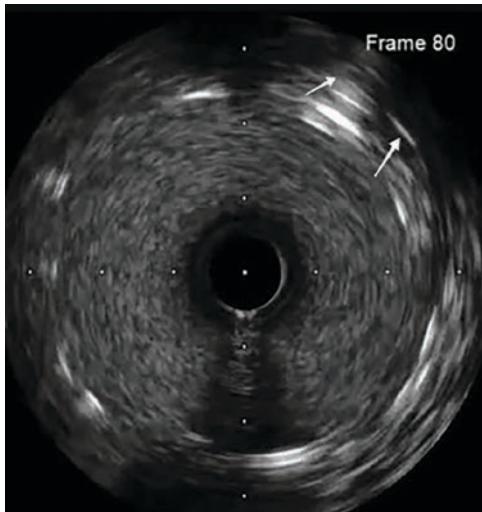


Figure 4A. Final IVUS.

stable and asymptomatic, with no complications on serial non-invasive evaluations. Periodic follow-up visits were conducted, with the most recent evaluation in early September 2025 showing preserved left ventricular function on echocardiography and good functional status without any cardiac symptoms.

Take-Home Messages

- IVUS guidance provides superior visualization of stent deployment and wire-related complications compared with angiography alone.
- Dual wiring techniques in bifurcation lesions require careful management to



Figure 5. Angiographic image showing final results (black arrow).

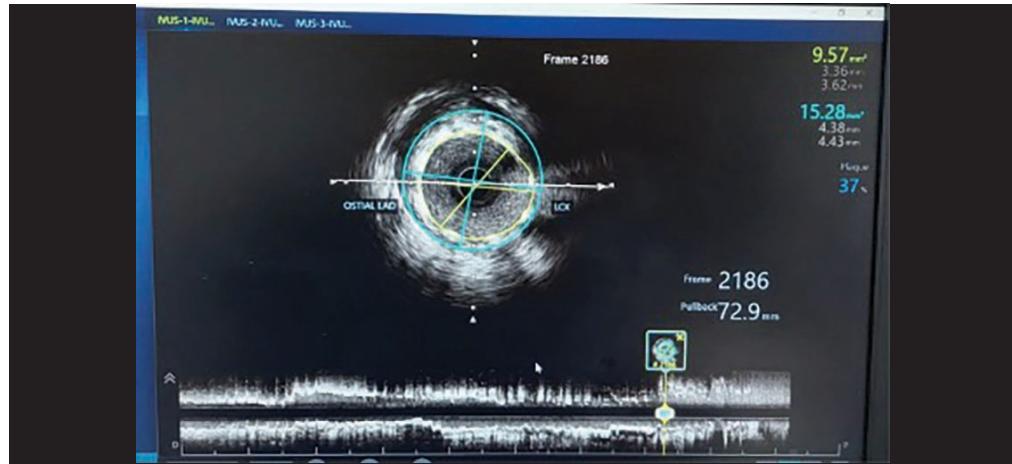


Figure 4B. IVUS pullback from the distal left main stem (LMS) demonstrated a minimum stent area (MSA) of 12.92 mm^2 . A wire loop was visualized at the 3 to 5 o'clock position, without evidence of stent distortion or malapposition. The findings confirmed adequate stent expansion and apposition within the LMS.

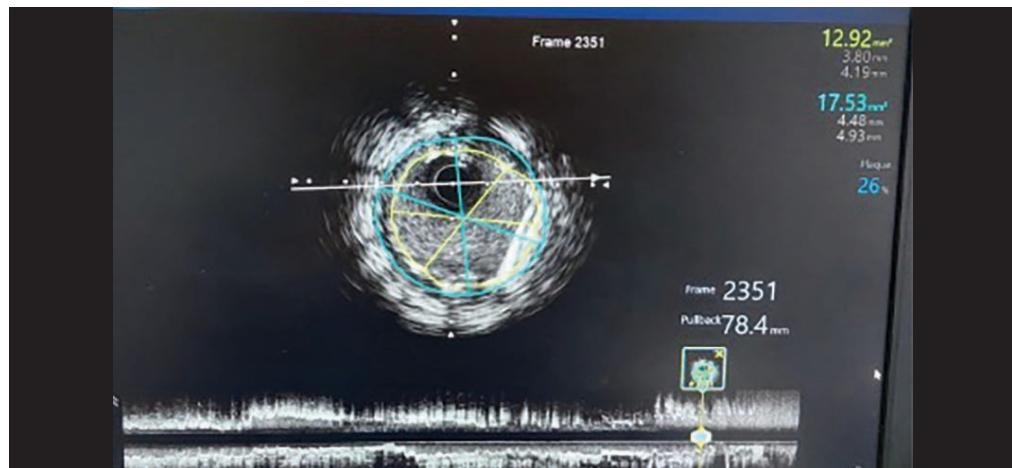


Figure 4C. The stented segment demonstrated a minimum stent area (MSA) of 9.57 mm^2 with a luminal diameter of $3.36 \times 3.62 \text{ mm}$. The vessel cross-sectional area measured 15.28 mm^2 , with media-to-media diameters of $4.38 \times 4.43 \text{ mm}$, indicating scope for further optimization. Accordingly, additional post-dilatation was performed using a 4.0 mm non-compliant balloon, achieving excellent stent expansion and apposition.

prevent entrapment or fracture of the side branch wire.

- Entrapped or fractured wires can be managed by retrieval, crushing with an additional stent, or jailing, depending on feasibility and safety. ■

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Videos 1-6 are available online with the case by Hanif et al:

