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A 52-year-old man presented with acute chest pain. He was diagnosed with non-ST-segment elevation myocardial infarction, and coronary angiography revealed a focal 90% stenosis (Figure 1) in the distal right coronary artery (RCA).

During guide-catheter engagement, an iatrogenic dissection developed near the RCA ostium before guidewire advancement (Figure 2). Bailout wiring was attempted, but the guidewire repeatedly entered the false lumen. Subsequent angiography demonstrated retrograde extension into the aortic root and ascending aorta (Figure 3). Immediately after contrast injection, ventricular fibrillation occurred. Following successful resuscitation, the procedure was discontinued and the cardiac surgical team was contacted.

Computed tomography angiography (CTA) demonstrated extensive aortic dissection extending to the celiac trunk, with distal re-entry and persistent false-lumen perfusion (Figure 4-A, B, C, D). Because immediate surgery was not possible and surgical revascularization of the distal RCA was considered technically unfavorable, the heart team requested percutaneous coronary intervention (PCI) to restore RCA integrity before aortic surgery.

The patient returned to the catheterization laboratory for intravascular ultrasound (IVUS)-guided bailout PCI. IVUS demonstrated a large dissection flap near the RCA ostium, which repeatedly redirected the guidewire into the false lumen (Figure 5). After prolonged manipulation, true-lumen wiring was achieved (Figure 6). The coronary entry tear was successfully sealed with an ostial stent, and PCI of the original distal RCA lesion was completed (Figure 7, 8). Because the entry appeared completely sealed and the patient remained hemodynamically stable, surgery was deferred in favor of close observation under intensive blood-pressure control.

However, follow-up CTA after 3 days demonstrated further progression to the renal artery level and involvement of the supra-aortic branch ostia (Figure 9). The patient subsequently underwent ascending aortic and hemiarch replacement, after which further progression was controlled.

This case demonstrates that successful coronary entry sealing may restore coronary perfusion but may not stabilize an extensive aortic dissection when distal re-entry maintains false-lumen pressurization. Close serial imaging and early surgical reassessment remain essential.