

1168 **When Every Wire Chose the Branch: an IVUS-Unmasked 270° Reverse Take-off of a Proximal LAD CTO Crossed Antegradely with a Dual-Lumen Microcatheter over a Side-Branch Anchor**

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Background. A 65-year-old man with hypertension, dyslipidemia, and prior ischemic stroke was referred for persistent exertional angina despite antianginal therapy. Echocardiography showed preserved LV systolic function (LVEF 55%) with a regional wall-motion abnormality in the LAD territory.

Angiographic findings. Angiography revealed a proximal LAD chronic total occlusion (CTO, TIMI 1). The distal LAD filled through retrograde collaterals (Rentrop grade 2 from both the left circumflex and right coronary arteries), which were otherwise normal. The ambiguous proximal cap sat on a bifurcation giving off multiple septal branches and a diagonal, adjacent to the second diagonal (D2). With a blunt/calcified cap and occlusion length ≥ 20 mm, the J-CTO score was 3 (difficult).

Procedure. Through a single left-radial 6-Fr guide, initial antegrade wiring (Runthrough, SION blue, Fielder XT-R via a Turnpike LP microcatheter) failed because the wires repeatedly entered the septal branches or D2 rather than the LAD. A wire was placed in D2 and the branch was dilated to restore flow and create a rail; IVUS from D2 then revealed a severely angulated, near-reverse (~ 270 degrees) LAD take-off with seated plaque, explaining the difficulty. A SASUKE dual-lumen microcatheter was advanced over the D2 wire, and through its monorail lumen a Whisper wire was steered around the ~ 270 -degree angulation into the LAD, achieving antegrade crossing. Pre-intervention IVUS showed diffuse fibrocalcific plaque with a superficial calcification arc and a narrowed lumen. After predilation, a Centum 3.0 x 24 mm drug-eluting stent was deployed; post-stent IVUS showed under-expansion, corrected by high-pressure non-compliant balloon post-dilation, with IVUS confirming true-lumen crossing and good final expansion.

Outcome. Antegrade recanalization was achieved with final TIMI 3 flow and no complication; the patient was discharged uneventfully.

Teaching points. (1) A CTO cap hidden on a bifurcation of septal and diagonal branches diverts antegrade wires into the branches, and the true near-reverse (~ 270 -degree) take-off angle may be unmasked only after side-branch preparation and IVUS. (2) Anchoring a wire in the side branch (D2) and redirecting a second wire through a dual-lumen microcatheter's monorail lumen achieved antegrade crossing without escalation to a retrograde approach. (3) IVUS helped characterize the cap and guide the wire-entry strategy.