

A Hybrid, Multi-Technique Approach to a Single High J-CTO Score Mid-RCA Lesion: Retrograde Collateral Wiring, ADR/Knuckle-Wire, and Reverse CART

Manas Gundala¹

Georgios Sianos², Raghu Cherukupalli¹, Sree Harsha¹

1 Department of Cardiology, Yashoda Hospital, India

2 Cardiology, Al Qassimi Hospital, UAE

Target Lesion:

A 67-year-old male with acute decompensated heart failure and severe LV dysfunction had calcific triple-vessel disease, including a long-segment, heavily calcified mid-RCA CTO filled retrogradely via LAD septal collaterals. The proximal cap was blunt and ambiguous, and two side branches arose directly from within the occluded segment — effectively a bifurcating CTO. J-CTO score >3. A prior straightforward antegrade attempt elsewhere had failed.

Strategy:

No single crossing technique sufficed; recanalization required sequential escalation through multiple approaches on the same lesion. Standard right radial and right femoral access (6Fr each) was used. Retrograde wiring (Runthrough → SION Black) crossed the septal collateral into the distal RCA true lumen first, establishing a retrograde option. Antegrade crossing then used a GAIA Third wire exchanged for a Fielder XT, knuckled via ADR (antegrade dissection re-entry) — a large knuckle to enter the sub-intimal space through the calcification, downsized to a small knuckle for controlled true-lumen re-entry. Reverse CART via a guide extension catheter then connected the antegrade and retrograde wires (Conquest Pro antegrade, GAIA Next 3 retrograde). Extensive serial predilation addressed the calcium burden, followed by two overlapping Ultimaster Nagomi DES (2.25×38 mm and 2.75×38 mm) with post-dilation and proximal optimisation.

Final Result:

TIMI III flow with no residual stenosis or dissection. A single blunt, calcified, bifurcating CTO that defeated a straightforward antegrade attempt was ultimately recanalized only by combining three distinct techniques in sequence — retrograde collateral wiring, ADR/knuckle-wire crossing, and reverse CART — each compensating for where the previous one reached its limit.