

C-10 Overcoming Coronary Calcification in a Donor Vessel Supplying CTO Collaterals:
Sequential Rotational Atherectomy and Cutting Balloon Angioplasty in NSTEMI-ACS

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Purpose: Severe coronary calcification predisposes to stent underexpansion, and this risk is compounded when the calcified vessel also donates collateral flow to a chronic total occlusion (CTO), since compromise threatens two myocardial territories simultaneously. We describe a strategy for a severely calcified donor left anterior descending artery (LAD) culprit lesion supplying collaterals to a right coronary artery (RCA) CTO.

Methods: A 65-year-old woman presented with NSTEMI-ACS due to a critically calcified LAD lesion serving as both the culprit vessel and sole donor of collaterals to an RCA-CTO. Scoring and semi-compliant balloon preparation failed to achieve adequate plaque compliance, and an IVUS catheter could not cross the lesion, confirming severe calcification. Rotational atherectomy was performed with a 2.0mm burr (burr-to-artery ratio 0.50; 190-205 rpm, 10-12 second passes, 20 total passes), followed by a guide-extension-supported sequential balloon strategy (cutting, semi-compliant, and scoring balloons) before implantation of a 4.0/24mm drug-eluting stent at 12atm.

Results: Calcium modification allowed adequate lesion preparation and stent delivery. Final angiography demonstrated a widely patent LAD with preserved collateral flow to the RCA-CTO territory throughout the procedure, and no procedural complications occurred.

Conclusion: A staged strategy-balloon assessment, conservatively sized atherectomy, and sequential focal-force balloon optimization-achieved a favorable angiographic result while protecting collateral perfusion to a CTO-dependent territory. This approach may be a feasible template for similarly constrained donor-vessel scenarios, though further cases are needed to confirm generalizability.