

#Patient Profile

- * 48-year-old male
- * Newly diagnosed Type 2 Diabetes Mellitus
- * History of old inferior wall myocardial infarction (IWMI) on 03/07/2024, not thrombolysed
- * Presented with effort angina since the index MI

#Clinical Examination

- * Pulse Rate: 80/min, regular
- * Blood Pressure: 124/82 mmHg
- * Cardiovascular Examination: Normal S1 and S2, no murmur

#Investigations

ECG

- * Normal sinus rhythm
- * T-wave inversion in leads III and aVF

*Echocardiography**

- * Non-dilated LV
- * LVEF: 50%
- * Mild inferoseptal hypokinesia

Laboratory Parameters

- * Total Cholesterol: 143 mg/dL
- * LDL: 105 mg/dL
- * HDL: 22 mg/dL
- * Triglycerides: 264 mg/dL
- * HbA1c: 9.6%
- * Serum Creatinine: 1.0 mg/dL
- * Creatinine Clearance: 83 mL/min

Diagnosis

- * Coronary artery disease
- * Old IWMI (03/07/2024)
- * CCS Angina Class II
- * Normal sinus rhythm
- * Preserved LV function
- * Type 2 Diabetes Mellitus

Coronary Angiography Findings

Left Coronary System

- * Left Main: Normal
- * LAD: Mild disease in mid segment
- * Diagonal branch: Mild proximal disease
- * Distal RCA visualized through collateral circulation
- * LCX (non-dominant): Mild (40%) disease at origin of major OM
- * Major OM free of significant disease

#Right Coronary Artery

- * Dominant RCA
- * Proximal total occlusion (CTO)
- * Faint antegrade filling through bridging collaterals
- * Distal RCA filling through epicardial collaterals from left coronary system

#Angiographic Summary

- * Right dominant circulation
- * LAD: Mild disease
- * LCX: Mild tubular disease
- * RCA: Proximal CTO
- * Faint antegrade filling via bridging collaterals (Rentrop Grade 2)
- * Retrograde filling via epicardial collaterals (Collateral Connection Grade 2)

#Procedural Challenges

- * Ambiguous proximal stump
- * Presence of side branch at proximal cap
- * Tortuous vessel course
- * Long CTO segment
- * Poor interventional collateral channels
- * Bridging collaterals

#CTO Complexity Assessment

#J-CTO Score

Variable	Score
Proximal cap ambiguity	1
No interventional collaterals	1
Moderate/severe tortuosity	1
LCX CTO	0
Prior PCI	0
Total Score	**3**

Interpretation: Difficult CTO

#Additional CTO Scoring Systems

- * CTO score: 3 (Very difficult)
- * W-CTO score indicated high procedural difficulty
- * Overall prediction: Difficult wire crossing

#Procedural Strategy

*Planned Approach:** Antegrade Wire Escalation (AWE)

#Initial Setup

- * Right Radial Artery access
- * 7F SAL-1 guiding catheter
- * Teleport microcatheter

Wire Escalation Sequence

1. Fielder FC
2. Fielder XT
3. Gaia II

#Procedure Details

#Initial Attempts

- * Gaia II entered a false plane
- * Microcatheter also tracked into the wrong plane

#Microcatheter Angiography

- * Demonstrated side branch filling
- * Fielder XT failed to advance

#Parallel Wire Technique

- * Attempted due to failure of initial wiring
- * Inadequate guide support limited success

#Escalation of Support and Wire Strategy

- * Guide catheter changed from SAL-1 to AL-1 for better support
- * Escalated to Conquest Pro wire
- * Conquest Pro wire could not be redirected into the true lumen

#Advanced CTO Techniques

- * Parallel wire strategy repeated
- * Gaia II wire positioned subintimally
- * Crusade double-lumen microcatheter utilized
- * Seesaw technique with Gaia II and Conquest Pro performed

#Persistent Challenges

- * Repeated inability to enter the true lumen
- * Multiple failures despite wire escalation and parallel wiring

#Successful Crossing

- * Final attempt with Gaia II wire successfully crossed the CTO into the true lumen

Lesion Preparation

- * Predilatation performed with:
 - * 1.25 × 6 mm balloon
 - * 2.5 × 12 mm semi-compliant balloon
- * Wire exchange performed subsequently

Stent Implantation

Two Drug-Eluting Stents (DES) were deployed:

1. 3.5 × 28 mm DES
2. 3.5 × 33 mm DES

#Final Result

- * Excellent angiographic outcome
- * TIMI 3 flow achieved in RCA
- * Successful CTO recanalization

**Learning Points / Take Home Messages

1. Detailed understanding of CTO anatomy is essential for selecting the optimal crossing strategy.
2. Adequate guide support is a critical determinant of procedural success.
3. Double-lumen microcatheters are valuable tools for parallel-wire techniques.
4. A structured wire escalation strategy improves the likelihood of successful CTO crossing.
5. Persistence and systematic escalation can convert an apparently failed case into a successful CTO PCI.

****Outcome:**** Successful antegrade CTO PCI of proximal RCA CTO with DES implantation and restoration of TIMI 3 flow.