# Complex PCI in Severe Calcified RCA Lesion- ROTA failure, OAS Success

Iskandar Mirza Amran

[1]Department of Cardiology, Institut Jantung Negara, Malaysia

A 52-year-old gentleman with a known history of dyslipidemia, chronic kidney disease (Stage 3a), and active smoking was referred to our center for recent non-ST-elevation myocardial infarction (NSTEMI). Electrocardiogram (ECG) showed biphasic T-waves in leads I, aVL, and V2-V6. Transthoracic echocardiogram revealed a left ventricular ejection fraction (LVEF) of 46% with hypokinesia at the basal inferior wall.

Coronary CT calcium scoring was performed, revealing a total Agatston score of 3,144, with a significantly high calcium burden at the right coronary artery (RCA) (1,734 Agatston units). Coronary angiography demonstrated severe three-vessel coronary artery disease with left main stem involvement. The SYNTAX score was 28, and the patient was referred to the cardiothoracic team for coronary artery bypass grafting (CABG). However, he declined surgery and opted for percutaneous coronary intervention (PCI).

A staged PCI was planned for the RCA. Initial angiographic images showed heavily calcified disease from the mid to distal RCA, with a tandem lesion involving the posterolateral (PL) branch and tortuosity at the distal RCA. A JR 4.0 7Fr guiding catheter was used, and a Runthrough Floppy wire was successfully advanced to the PL branch. Initial lesion preparation with a 1.5/15 mm semi-compliant balloon was performed. Attempts to further predilate with a 2.0/15 mm scoring balloon were unsuccessful, as the balloon could not cross the distal lesion. Switching to a 2.0/15 mm semi-compliant balloon also failed to modify the calcified lesion. IVUS was attempted but could not cross the proximal stenosis.

Given the undilatable, heavily calcified lesion, a decision was made to proceed with rotational atherectomy (ROTA) under temporary pacemaker support. A ROTA Floppy wire was used in conjunction with a Pronavi microcatheter, and a 1.5 mm burr was selected. Due to vessel angulation at the mid RCA, a guide extension catheter (Telescope) was used to facilitate burr delivery. However, the guide extension could not cross the angulated segment, limiting burr advancement. Four ROTA runs were performed at 180,000 rpm, but the patient developed multiple episodes of chest pain with transient ST elevation on the cardiac monitor. The procedure was aborted, and the patient was scheduled for a second-stage PCI one week later.

During the second session, the approach was modified. A SAL 0.75 7Fr guiding catheter was used for enhanced support. The Runthrough Floppy wire with a Caravel microcatheter was advanced to the PL branch. Orbital atherectomy (OAS) was performed using a VIPER wire with seven passes (4 at 80,000 rpm and 3 at 120,000 rpm). The VIPER wire was then exchanged for a Runthrough Floppy wire, and the lesion was predilated with a 2.5/15 mm non-compliant balloon. IVUS was successfully performed, showing fractured calcium, a distal vessel reference diameter of 4.5 mm, proximal reference diameter of 5.0 mm, and a minimal stent area (MSA) of 2.29 $mm^2$ at the tightest segment.

The lesion was further predilated using a 3.5/15 mm scoring balloon followed by a 4.0/15 mm non-compliant balloon. A drug-eluting stent (DES) measuring 4.0/25 mm was deployed at 15 and 17 atmospheres. Final IVUS showed excellent stent expansion and apposition, with no edge dissection and a final MSA of 13.35 $mm^2$.