

Directional Coronary Atherectomy for a Calcified Nodule in the Right Coronary Artery Facilitated by Coaxial Anchor Technique and Guiding Catheter Deep Seating

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An 84-year-old male was admitted to another hospital for heart failure with findings of infero-posterior ischemia. After stabilization, he was referred to our hospital. Coronary angiography revealed severe stenosis of the dominant RCA with calcification suggestive of a calcified nodule. Comorbidities included hypertension, diabetes mellitus, dyslipidemia, and paroxysmal atrial fibrillation.

In the 1st session, an 8Fr Amplatz left (AL) 1.0 guiding catheter was used. A workhorse wire crossed into a myocardial branch. An optical coherence tomography (OCT) catheter failed to cross the lesion, despite the use of a guide extension catheter. Rotational atherectomy (RA) was performed with a 1.5 mm burr. OCT showed an eruptive calcified nodule and guidewire bias seemed unfavorable. A second route around the calcified nodule was crossed with another guidewire, but the guidewire bias was also not favorable. RA was performed with 1.5 mm and 1.75 mm burrs. Aggressive Wire Recanalization in Calcified Atheroma and Dilation (ARCADIA) was attempted using intravascular ultrasound (IVUS) and a Zizai + Conquest Pro 12 Sharpened Tip (CP12ST), but it failed due to poor guidewire support. The procedure resulted in a suboptimal outcome with 75-90% residual stenosis.

In the 2nd session, an 8Fr AL 1.5 guiding catheter was used. A workhorse wire crossed into the second route. ARCADIA was attempted using the slip-stream technique (IVUS, Crusade type R, and CP12ST) and the balloon screening technique, but both failed. The guiding catheter was exchanged for an 8Fr CR 4.0 for directional coronary atherectomy (DCA). Following predilatation with a Wolverine 2.75 × 10mm, the DCA catheter (Atherocut M 6 mm) failed to cross.

To overcome this, the guiding catheter was changed to a 7Fr JR4.0. Using a coaxial anchor technique with a Wolverine 3.25 × 10mm, the guiding catheter was deeply seated and advanced across the calcified lesion itself. This robust support enabled the DCA catheter to successfully cross the lesion, and 21 cuts were performed. IVUS confirmed successful atherectomy of the calcified nodule. After dilatation with a Wolverine 3.25 × 10mm and a 5.0 × 8mm non-compliant (NC) balloon, angiography showed <30% residual stenosis. IVUS demonstrated a minimal lumen diameter of 3.7mm. Treatment with a drug-coated balloon was applied, and the procedure finished without complications.

Conclusion: When sufficient acute gain is not achieved despite using RA, DCA is a viable treatment option for eruptive calcified nodules. This case describes the effectiveness of the coaxial anchor technique and deep seating of the guiding catheter across the lesion to overcome challenging DCA catheter delivery.