

Successful Combination Therapy With Rotational and Orbital Atherectomy for a Severely Calcified Nodule at the Ostial of the Right Coronary Artery

Toshinori Ko¹

Fumiya Kawano¹, Mana Sawahata¹, Ayano Sezaki¹, Yusuke Otsuka¹, Makoto Watanabe¹, Isamu Fukuizumi¹,
Yusuke Hosokawa¹

¹ Department of Cardiovascular Medicine, Nippon Medical School Musashikosugi Hospital, Japan

The patient was a 76-year-old woman with three-vessel coronary artery disease and percutaneous coronary intervention(PCI) had been performed for the left coronary artery at a previous hospital. She was subsequently referred to our hospital because complex PCI using atherectomy devices was required for a residual severe calcified lesion at the ostium of the right coronary artery (RCA).

Coronary angiography (CAG) demonstrated 99% stenosis at the RCA ostium caused by a severely protruding calcified nodule. Because stable engagement of the guiding catheter was difficult, the guidewire was advanced into the RCA using the floating-wire technique. With the support of a guide extension catheter, an intravascular ultrasound (IVUS) catheter was advanced across the lesion. IVUS demonstrated unfavorable wire bias away from the calcified nodule. Because the severe luminal narrowing and unfavorable wire bias increased the risk of injury to the adjacent normal vessel wall, rotational atherectomy was selected as the initial debulking strategy because its differential cutting mechanism was expected to minimize an injury to the adjacent normal vessel wall.

After ablation with a 1.5-mm Rotablator burr, IVUS demonstrated formation of a groove on the surface of the calcified nodule, allowing the guidewire to naturally fall into the groove and resulting in marked improvement of wire bias.

Consequently, orbital atherectomy was subsequently performed to deepen the groove and achieve further lesion modification. While carefully adjusting the position of the guiding catheter, orbital atherectomy successfully created a deeper groove within the calcified nodule. Additional lesion preparation with a cutting balloon achieved sufficient lumen enlargement, and stent-less PCI was successfully completed using a drug-coated balloon without stent implantation.

Calcified nodules involving the RCA ostium are associated with poor long-term outcomes after stent implantation. Therefore, stent-less PCI with optimal lesion preparation has recently emerged as an attractive therapeutic strategy in selected patients. In the present case, rotational atherectomy created an initial groove and improved wire bias, thereby facilitating more effective orbital atherectomy. This stepwise lesion modification strategy enabled sufficient debulking and successful stent-less PCI using a drug-coated balloon. This case highlights a practical treatment strategy for severely calcified ostial coronary lesions caused by calcified nodules.