

Clinical Experience of Percutaneous Coronary Intervention for Severely Calcified Coronary Artery Lesions with Orbital Atherectomy System

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Background: Severely calcified lesions present many challenges to percutaneous coronary intervention (PCI). Recently, a newly developed atherectomy device, Diamondback coronary orbital atherectomy system (OAS) has been approved.

Aim: We enrolled 292 consecutive cases (374 lesions) who underwent PCI with OAS in Kyoto Katsura Hospital from February 2018 to November 2020. We assessed the clinical outcomes after OAS of severely calcified lesions; procedure success, angiographic complications, in-hospital major adverse cardiac events (MACE; cardiac death, MI [MI: CK-MB > 10 × ULN] and target vessel/lesion revascularisation [TVR/TLR]) and mid-term results at 8 months after PCI.

Results: Mean age was 76 years old and 75% of the patients were men. *De novo* lesions were 83% and in stent restenosis (ISR) was 7%. Optical frequency domain imaging (OFDI) was used as the imaging device in 54%

of cases. We performed OAS at low revolution speed in all cases and made an addition at high revolution speed in 67% of lesions, while 9% of lesions needed rotational atherectomy. Eight-four per cent of lesions were treated with drug coated-balloons (DCB), and stents were implanted in 14% of lesions. Procedural success rate was 97%. In complications, coronary perforation occurred in 1% of lesions and persistent slow flow in 2%. In in-hospital MACE, there were 23 nonQ MI (8%), one cardiac death (0.5%), and no TLR. In post-discharge MACE, there were no cardiac deaths and no MI, but 8% TLR. Follow-up angiography was performed in 180 of 273 lesions (66%) that were eligible for follow-up at 8 months. Restenosis was observed in 10% of lesions.

Conclusion: OAS has been shown to have high procedure success rate and low restenosis rate. OAS is going to be another option for reducing calcified plaque. □