

PCAT: A Novel Low-Profile Distal Embolic Protection Technique for Jetstream
Atherectomy in a Heavily Calcified Superficial Femoral Artery CTO

Son Uhyon, Yoshinori Tsubakimoto, Shin Takiuchi, Saori Kuno, Yuya Sakaguchi, Takuya
Tominaga, Takehiro Kogame, Koji Yanaka, Kasumi Ishibuchi, Katuyuki Hasegawa,
Satoru Otsuji

Department of Cardiology, Higashi Takarazuka Satoh Hospital, Takarazuka, Japan

Background: Distal embolization remains a major concern during atherectomy for heavily calcified femoropopliteal lesions. Although techniques such as FCAT and RCAT have been introduced, they require large-bore sheaths and increase procedural invasiveness. We report the first clinical application of the Popliteal-Controlled Atherectomy Technique (PCAT), a novel low-profile distal protection strategy. **Case:** An 87-year-old woman was referred after failed endovascular treatment for a chronic total occlusion (CTO) of the right superficial femoral artery because of unsuccessful lesion crossing. EVT was performed via an ipsilateral antegrade approach. After crossing the lesion with a 0.018-inch CROSSLEAD Penetration guidewire, a microcatheter could not be advanced due to severe calcification. Lesion modification with a Wingman catheter enabled guidewire exchange to 0.014 inch. Intravascular ultrasound demonstrated circumferential severe calcification, and Jetstream XC atherectomy was planned. For distal embolic protection, the popliteal artery was punctured and a 3-Fr Parent Plus catheter was inserted retrogradely. After establishing pull-through wire access, a balloon introduced through the 3-Fr sheath was inflated to temporarily interrupt antegrade flow. Atherectomy was then successfully performed using a 2.4-mm Jetstream XC followed by Blade-Up 3.4-mm passes. After adequate debulking, balloon angioplasty and drug-coated balloon treatment achieved an excellent angiographic result without distal embolization. **Conclusion:** PCAT provides effective distal embolic protection using only a 3-Fr retrograde system, offering a simple and minimally invasive alternative to conventional protection techniques. This novel approach may enhance the safety of Jetstream atherectomy for heavily calcified femoropopliteal CTO lesions.