1094 **Successful Treatment of a Long Calcified Femoropopliteal CTO Using IVUS-Guided Wiring and Jetstream Atherectomy via Bidirectional Approach with Trans-Ankle Access Through an Occluded ATA**

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Background:

Endovascular treatment (EVT) for long chronic total occlusions (CTO) in the femoropopliteal (FP) segment with heavy calcification remains technically challenging, particularly due to difficulty in wire passage and optimal lesion preparation. While atherectomy using the Jetstream system has become a promising strategy, the risk of distal embolization remains a major concern.

Case:

A woman in her 80s presented with right lower limb claudication. Her ankle-brachial index (ABI) was unmeasurable. Computed tomography revealed a long occlusion extending from the proximal right superficial femoral artery (SFA) to the popliteal artery. The posterior tibial artery (PTA) was patent, while the anterior tibial artery (ATA) was occluded. We performed bidirectional EVT using both crossover and trans-ankle approaches. Retrograde access via the dorsalis pedis artery was attempted. Due to occlusion of the ATA, knuckle wiring was performed using a Crosslead Tracker, followed by intravascular ultrasound (IVUS)-guided parallel wiring.

After wire escalation to an Astato XS 9-40, we advanced the wire into the popliteal artery through the intraluminal space, and successfully inserted the Parent Select 5082 system into the popliteal segment.

Antegrade wiring with Halberd and Ichibanyari wires achieved a retrograde-to-antegrade rendezvous and established pull-through access. However, IVUS revealed that the wire course remained in the intramedial space of the distal SFA and popliteal artery due to severe calcification.

Under retrograde IVUS guidance, we attempted re-entry into the true lumen from the antegrade side using the Tip Detection technique. Multiple attempts using Crosslead Penetration 14/18 and Crosser IQ were unsuccessful. We then employed the HIP (High-penetration Intraluminal Passage) technique by cutting and sharpening the tail of a 0.035-inch Radifocus wire, which successfully penetrated and modified the calcified plaque. The Astato XS 9-40 was reintroduced, enabling full lesion crossing and antegrade-to-retrograde pull-through.

IVUS confirmed intraluminal wire tracking throughout the lesion.

Lesion preparation was performed using a Jetstream XC 2.4/3.4 mm device. During atherectomy, balloon occlusion of the popliteal artery was conducted from the retrograde ATA access to achieve distal protection. Debris was aspirated using an aspiration catheter, and angiography following atherectomy confirmed that BTK runoff was maintained, without any slow or no flow.

IVUS confirmed sufficient debulking of the calcified plaque. High-pressure balloon angioplasty was performed using SHIDEN HP 6.0/200 mm in the SFA and 5.0/200 mm in the popliteal artery without major dissection or perforation. Drug-coated balloons (Ranger 6.0/200 mm and 5.0/200 mm) were deployed to complete the procedure.

Conclusion:

We report a complex FP CTO case in which IVUS-guided wiring enabled retrograde access through an occluded ATA, allowing safe and effective atherectomy using Jetstream with distal protection.

This case illustrates the potential utility of trans-ankle intervention (TAI) in challenging CTOs, especially when combined with imaging-guided techniques and appropriate embolic protection strategies.

We aim to discuss the advantages and feasibility of TAI in complex lesions with reference to the current literature.