

P-04 **Wire connection and externalization using dual-direction (antegrade and retrograde) microcatheters in Complex Below-the-Knee Lesions: Two Cases**

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Background

Endovascular treatment of chronic total occlusion (CTO) in below the knee arteries remains technically challenging, especially in cases with complex anatomy, heavy calcification, or ambiguous re-entry points. While antegrade approach is often the first-line strategy, its failure necessitates advanced techniques such as retrograde access and wire externalization. To avoid jailing of non-target BTK in BTK CTO lesions, wire connection for externalization should be performed within the target BTK artery. Due to the small vessel size in this region, it is preferable to use dual-direction (antegrade and retrograde) microcatheters to facilitate wire connection. We showed Two cases highlighting the practical application and outcomes of retrograde recanalization with wire externalization.

Case 1

Patient: 84-year-old male with diabetes, hypertension, hyperlipidemia, and necrosis of the left first toe.

Clinical Background:

The patient presented with ischemic diabetic foot and progressive necrosis of the left 1st toe. Initial angiography revealed multiple chronic total occlusions (CTOs) including the anterior tibial artery (ATA), peroneal artery, posterior tibial artery (PTA), and plantar artery. Among these, the ATA was targeted as the main route for revascularization due to its potential distal run-off.

Procedure Details:

Antegrade access via the left proximal superficial femoral artery (SFA) was obtained under ultrasound guidance. Initial attempts to cross the ATA CTO using 0.035" Terumo wire supported by a 4Fr Glide catheter were unsuccessful; the wire entered a subintimal plane and failed to re-enter the distal true lumen. Escalation of wire strategy using 0.014" Gladius, Regalia, and Halberd wires supported by a TrailBlazer microcatheter also failed to negotiate the lesion into the true lumen of distal ATA or dorsalis pedis artery (DPA).

Given persistent failure, retrograde access was obtained via ultrasound-guided puncture of the dorsalis pedis artery. A 0.014" Command ES wire supported by a TrailBlazer microcatheter successfully advanced retrograde through the ATA CTO and rendezvoused with the antegrade microcatheter. Externalization of the wire was achieved by delivering the retrograde wire into the antegrade TrailBlazer microcatheter at the 5 Fr SFA sheath.

Balloon angioplasty was performed using a series of long balloons: 2.5/2.0×210mm Nanocross and 1.5×120mm Armada, with inflation pressures up to 18 atm. After difficulty in mid-ATA crossing due to resistance, an additional pass with a new 0.014" Command ES wire was needed, followed by repeated dilatation using a 3.0/2.5×210mm Nanocross balloon. Final angiography showed brisk flow through the ATA into the plantar arch via DPA, with full recanalization of the infrapopliteal pathway. Mynx closure device was applied.

Case 2:

Patient: 49-year-old male with diabetes, hyperlipidemia, and left foot numbness with lifestyle-limiting claudication.

Clinical Background:

Angiography showed multifocal stenoses of the SFA, CTO at P3 segment of the popliteal artery, and a long segment CTO of the posterior tibial artery (PTA), along with proximal ATA stenosis. The patient was selected for multi-level endovascular intervention given disabling symptoms.

Procedure Details:

Antegrade femoral access was achieved under ultrasound guidance. 0.014" Command ES, Gladius, and Halberd wires supported by TrailBlazer microcatheter were used, but failed to cross the popliteal CTO lesion.

Retrograde access was obtained via the dorsalis pedis artery. Retrograde 0.014" Command ES wire was used to successfully navigate the popliteal artery CTO. A second retrograde wiring attempt with Gladius enabled passage into the true lumen of popliteal artery. Retrograde TrailBlazer catheter was advanced to popliteal artery level. Simultaneously, antegrade 0.014" Regalia wire was navigated from femoral access and entered the retrograde microcatheter, allowing controlled externalization.

Angioplasty was performed for the P3 popliteal CTO and pATA using 2.5×120mm Nanocross balloon, inflated twice up to 14 atm with good luminal gain and residual stenosis <40%. For proximal SFA multifocal stenoses, 5.0×200mm Mustang ballooning followed by sequential DCB (4.0×150mm and 4.0×120mm InPact Admiral) achieved satisfactory angiographic results without dissection. Hemostasis achieved with Mynx closure device.

Outcome:

Successful recanalization of complex multi-level femoropopliteal and infrapopliteal lesions via dorsalis pedis retrograde approach. Excellent flow restored with no stent implantation needed.

Conclusion:

This case series demonstrates that retrograde recanalization with wire externalization is a feasible and effective bailout strategy in complex BTK CTO lesions using dual-direction (antegrade and retrograde) microcatheters when antegrade approach fails.