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Case Description

An octogenarian man presented with intermittent claudication of the right leg. The ankle-brachial index was reduced, and computed tomography angiography demonstrated chronic total occlusion (CTO) of the right popliteal artery. Endovascular treatment (EVT) was performed through an ipsilateral antegrade approach. Angiography demonstrated CTO extending to the below-the-knee (BK) bifurcation.

Initial antegrade wiring using conventional guidewires failed because of an extremely hard proximal cap. IVUS confirmed intraplaque wire passage and revealed marked aneurysmal dilatation (>8 mm), leading to an intraprocedural diagnosis of popliteal artery aneurysm (PAA)-related CTO. Antegrade penetration with a Crosslead Penetration 14 guidewire was unsuccessful.

A retrograde approach via the posterior tibial artery was then established. The distal cap was penetrated using Crosslead Penetration 14, and a Crosslead Tracker was advanced with the knuckle technique. Although the antegrade and retrograde guidewires appeared widely separated angiographically, IVUS confirmed that both remained within the plaque. After proximal balloon dilatation, the retrograde guidewire was advanced into the same intraplaque space, allowing rendezvous and pull-through.

Subsequent IVUS demonstrated subintimal deviation in the P2–P3 segment. Additional IVUS-guided rewiring successfully achieved complete intraplaque crossing despite the extremely hard and tortuous lesion. Final angioplasty using a 7-mm drug-coated balloon achieved an excellent angiographic result without stent implantation.

Conclusion

Because the aneurysm extended to the BK bifurcation, stent-graft implantation was not feasible owing to the lack of an adequate distal landing zone. This case demonstrates that IVUS-guided bidirectional intraplaque wiring enabled branch-preserving, stentless EVT for anatomically complex distal bifurcation PAA.