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A 77-year-old asymptomatic male patient with a history of incidental surgical consultation was found to have a proximal occlusion of the left anterior descending artery (LAD) on coronary CTA. Further coronary angiography revealed a proximal LAD occlusion; however, multiple angiographic projections and bilateral injections were unable to clarify the approximate course or precise origin of the occluded segment. Intravascular ultrasound (IVUS, Opticross, Boston Scientific) performed via the circumflex artery revealed that a small terminal branch of the left main was the ostium of the LAD. Further IVUS pullback from this small branch confirmed that approximately 5 mm from the ostium of LAD was indeed the true proximal LAD occlusion site.

An antegrade wiring technique using a UB3 guidewire was employed, but the wire advanced into the subintimal space. A switch to the retrograde approach was made, and the retrograde UB3 guidewire successfully entered the occluded segment, but reverse wire escalation (RWE) was unsuccessful. Further attempts with Reverse CART accompanied with active greeting technique (AGT) also failed. IVUS imaging demonstrated that the antegrade guidewire had traversed the false lumen throughout the occluded segment, while the retrograde wire was located in the true lumen.

Retrograde RWE was then successfully used to cross the CTO lesion, yet the retrograde guidewire could not be delivered into the antegrade guiding catheter or extension catheter. A self made snare was created using a 2.0×20 mm balloon and a FielderXTA wire, successfully capturing the retrograde guidewire into the antegrade guiding catheter. Subsequently, an externalization was established with an RG3 wire, and final revascularization was achieved with deployment of two drug-eluting stents (DES) and one drug-coated balloon (DCB).

This case fully demonstrates the pivotal role of IVUS in localizing the entry point of the CTO segment and its value in guiding complex procedures, especially when Reverse CART technique fails.