

# Intravascular ultrasound-guided tip detection-antegrade dissection and re-entry for chronic total occlusion percutaneous coronary intervention after failed Stingray re-entry: First case in Europe

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In cases of failed chronic total occlusion (CTO) percutaneous coronary intervention (PCI) using antegrade wiring strategy, transition to the retrograde approach or the deployment of controlled, device-based antegrade dissection and re-entry (ADR) are recommended.

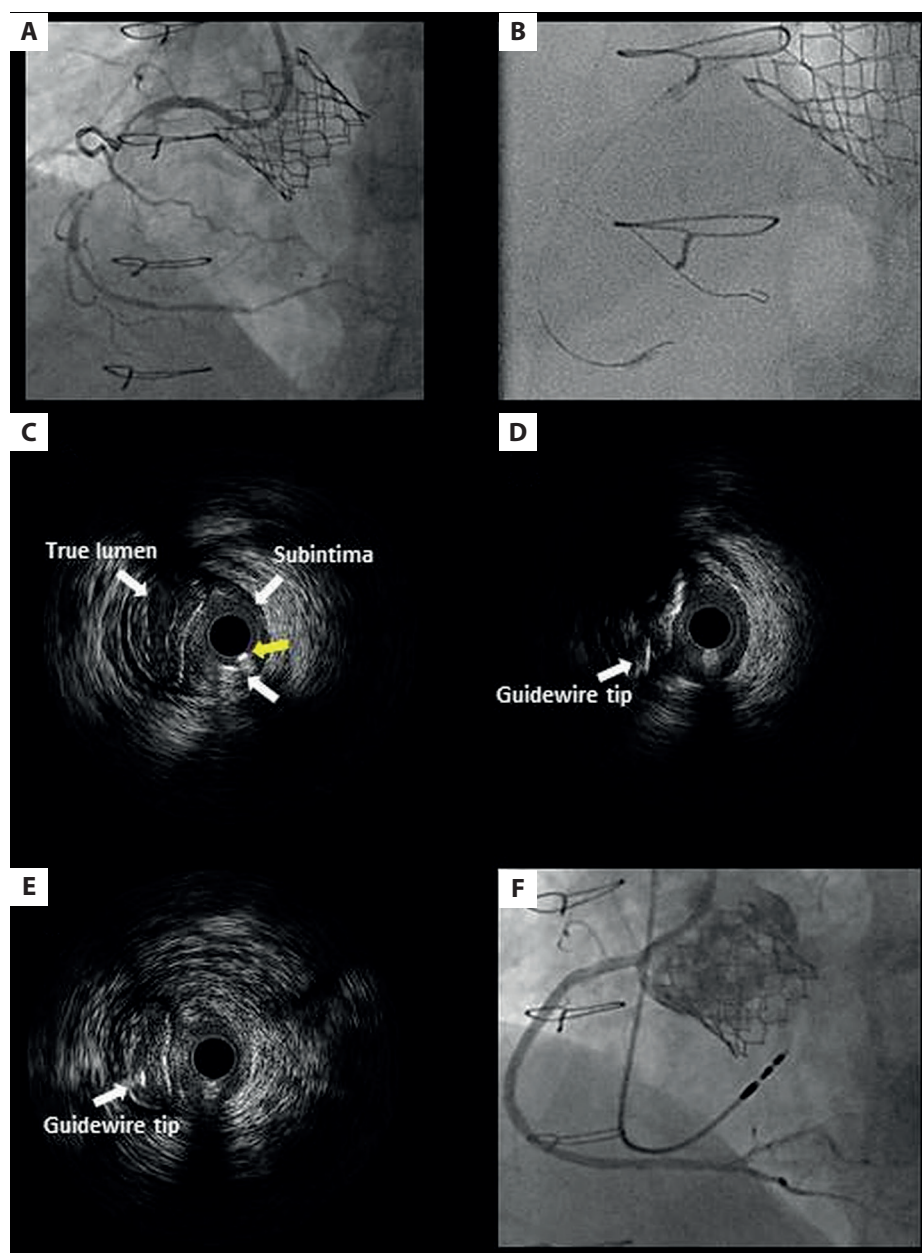
In 2021 in Japan, the intravascular ultrasound (IVUS)-based tip detection antegrade dissection and re-entry (TD-ADR) technique was developed for a precise and vertical puncture of the true lumen from the subintimal space under IVUS guidance [1–4]. We here report the first successful TD-ADR case in Europe following a failed ADR using a Stingray balloon (Boston Scientific).

A 78-year-old man with a 20-year history of coronary artery bypass grafting (all grafts occluded) and prior transcatheter aortic valve implantation (Sapien, Edwards Lifesciences LLC) presented with Canadian Cardiovascular Society class 3 angina for elective PCI of a chronically occluded right coronary artery (RCA) (Figure 1A). A 7.5 Fr sheathless guiding catheter was inserted from the right radial artery into the RCA ostium. Following failed antegrade wiring using Fielder XT-A and Gaia Third wires (both Asahi Intecc Co. Ltd), a Gladius MG wire (Asahi Intecc Co. Ltd) was advanced into the subintimal space using the knuckle wire technique. Subsequently, several unsuccessful attempts of Stingray-based ADR using the stick and drive technique with Confianza Pro 12 and Astato 20 wires (Asahi Intecc Co. Ltd) were performed under angiographic guidance (Figure 1B). After confirming the preserved true lumen in the mid-to-distal RCA

on HD IVUS (Boston Scientific), we decided to perform TD-ADR.

To this end, a second guidewire was placed into the same space of the subintima using a Sasuke double-lumen microcatheter (Asahi Intecc Co. Ltd) (Figure 1C). Subsequently, a Confianza Pro 12 wire, supported by a Finecross microcatheter (Terumo), was advanced to the planned re-entry site. The tip detection method allowed for a precise navigation of the tip of the Confianza Pro 12 wire followed by a vertical puncture into the true lumen of the RCA before the crux cordis (Figure 1D–E; Supplementary material, Video S1). Next, the Finecross microcatheter was advanced to the re-entry site under IVUS guidance, and the Confianza Pro 12 wire was replaced with a Sion Black wire (Asahi Intecc Co. Ltd), which was then advanced towards the posterolateral artery (PL). Subsequently, the posterior descending artery (PD) was wired using a Sasuke microcatheter, and balloon predilatation with the kissing balloon technique was carried out at the PD and PL ostia. Finally, two drug-eluting stents, Ultimaster Nagomi 2.5 × 50 mm and Ultimaster Nagomi 3.0 × 50 mm (Terumo Corp), were deployed under IVUS guidance from the crux cordis to the RCA ostium. This resulted in TIMI 3 flow into both PD and PL (Figure 1F). The patient was discharged in a stable condition the next day.

This case illustrates precise 3D navigation of the guidewire tip movement using HD IVUS for controlled re-entry into the true lumen of CTO after several attempts of failed



**Figure 1.** A. Coronary angiography — baseline CTO RCA. B. Unsuccessful attempt of Stingray-based ADR. C. IVUS image showing two guidewires in the subintimal space (arrows). D. IVUS image during the puncture of the wall between the subintima and the true lumen after clockwise guidewire rotation (arrows). E. IVUS image after successful puncture of the guidewire into the true lumen (arrow). F. Coronary angiography — final result

Abbreviations: CTO, chronic total occlusion; IVUS, intravascular ultrasound; RCA, right coronary artery

angiography-guided Stingray-based ADR. Our case highlights the practical utility of the long-tip pullback IVUS system coupled with a regular Confianza Pro 12 wire (both available in Europe) for standardized TD-ADR, that might potentially further increase the success rates of CTO PCI outside Japan.

### Article information

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