

IVUS-guided cap puncture of a stumpless chronic total occlusion with slipstream technique

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A 65-year-old woman suffering from exertional angina, underwent coronary angiography. A stumpless chronic total occlusion (CTO) was identified in the proximal left anterior descending (LAD) coronary artery, receiving epicardial collaterals from the right coronary artery (RCA). Percutaneous coronary intervention (PCI) was scheduled and an intravascular ultrasound (IVUS) catheter (OptiCross™, Boston Scientific Corp., Natick, MA, USA) was placed in a side branch adjacent to the CTO proximal cap, in order to identify it and guide the puncture. A dual lumen microcatheter (MC) (ASAHI SASUKE, Asahi Intecc, Tokyo, Japan) was inserted on the same IVUS mounted guide-wire (GW) through rapid exchange (RX) lumen of MC, and a CTO GW (ASAHI Gaia Second, Asahi Intecc) was introduced through the over-the-wire (OTW) lumen. The Gaia second wire successfully penetrated the CTO entry, identified between 7 and 10 o'clock in IVUS image. The procedure was

completed retrogradely using epicardial collaterals with successful result after implanting 3 drug eluting stents (DES) (Fig. 1).

This technique called Slipstream was firstly described by Kinoshita Y et al. and involves a combination of IVUS and a dual-lumen MC placed on the same GW through RX lumen and can facilitate the penetration of GW from subintimal space into true lumen. In our case, this technique was used to identify the CTO entry. This technique can offer more backup support and better proximal cap visualization during the CTO GW manipulation through the OTW lumen, compared to conventional IVUS guidance where the IVUS catheter and a single lumen MC are placed separately on two GWs.

Conflict of interest: None declared.

Consent statement: The patient signed informed consent.

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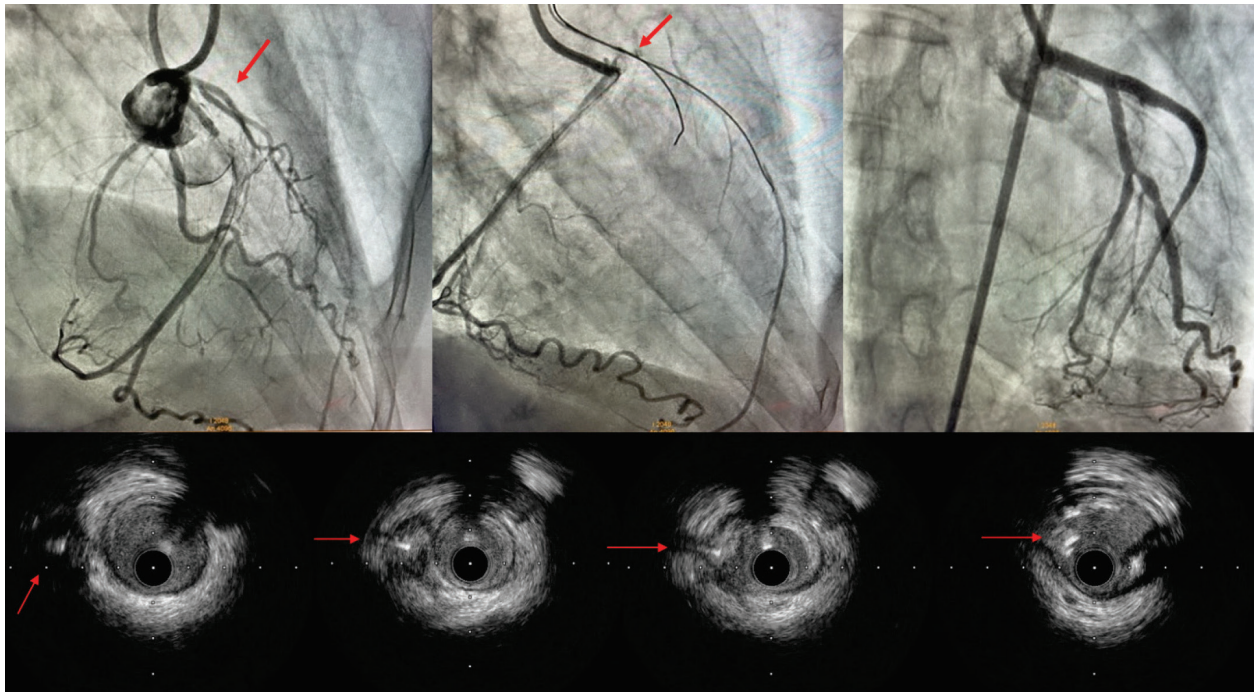


Figure 1. Bilateral injection shows a stump-less and long chronic total occlusion segment of LAD mid segment, with entry point presumably close to a septal branch (up left). IVUS catheter was placed into the septal branch after deeply advancing a floppy wire within this side branch. Afterward, a double lumen MC (ASAHI SASUKE, Asahi Intecc, Tokyo, Japan) was inserted on the same IVUS mounted guidewire through RX lumen of the microcatheter (up mid). IVUS examination revealed the CTO stump between 7 and 10 o'clock during the manipulation of a dedicated CTO GW through OTW lumen of the MC. Pulling back the IVUS catheter confirmed the correct puncture of CTO entry (sequence of IVUS images; lower). Successful final result after implanting three DESs (upper right). CTO — chronic total occlusion; DES — drug eluting stent; IVUS — intravascular ultrasound, LAD — left anterior descending coronary artery; MC — microcatheter; OTW — over-the-wire; RX — rapid exchange