

Patient after CABG with two non-grafted CTO PCI

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Introduction

Patient is a 68 year old male, doctor of medicine, former chairman of the internal medicine department, and a smoker. He was admitted for the first time to our hospital after an evaluation at the regional heart centre, due to multivessel symptomatic coronary heart diseases (MVCAD) in October 2019, despite medical therapy. In September 2019, he had suffered a myocardial infarction without ST elevation (NSTEMI), then in October 2019 he had a coronary angiography. Coronary angiogram showed moderate left main (LM) stenosis, diffuse disease of the left anterior descending artery (LAD) with proximal stenosis, diffuse disease of the first diagonal branch (DB1th), proximal short total chronic occlusion (CTO) of the circumflex branch (RCx) with homolateral filling of the two obtuse marginal branches (OMB). Dominant right coronary artery (RCA) was occluded too (2 CTOs) in the mid and distal segment. Echocardiographic evaluation showed good global systolic ventricular function with LVEF 60% and no apparent regional wall motion abnormalities. The patient underwent coronary bypass with vein grafting the 1st OMB and 1st DB and left internal thoracic artery (LITA) to the LAD. Surgeon was unable to graft the periphery of the RCA due to arterial wall calcification and diffuse atherosclerosis. The hospital course was uneventful and after ten days he was discharged from hospital.

Despite smoking cessation and medical therapy, he was re-admitted to the regional heart centre due to second NSTEMI with the mild decreased systolic function with LVEF 45%. Coronary angiogram showed patent bypasses to LAD and OMB1, and thrombotic subtotal occlusion of the vein graft to the DB. The medical therapy was recommended and he was discharged. Despite full medical therapy with the statin, betablocker, ACE inhibitor, nitrates and dual antiplatelet therapy, his angina was life limiting. He was admitted to our coronary care unit with unstable angina IIB2 according to Braunwal-Hamm classification. Diagnostic coronary angiogram showed similar findings, except for the occlusion of the vein graft to the DB and distal occlusion of the first OMB behind the distal anastomosis of the patient vein graft. We decided to perform PCI on short CTO of the proximal RCx and long CTO of the RCA.

Case report

We first performed the PCI on RCx by femoral approach. We engaged the LM with the 7F XB 4.0 catheter (Fig.1) and performed simple antegrade wire escalation technique (AWE). With the Fielder XT A wire with the microcatheter M-Cath (Acrostak) support, we crossed the occlusion (Fig.2). After predilatation with the Across CTO ST 1.1mm balloon and ACROSS HP 2.5 mm we implanted in LM and proximal RCx two drug eluting stent (DES) with good angiographic result (Fig.3) and improved perfusion of the inferolateral segment of the left ventricle.



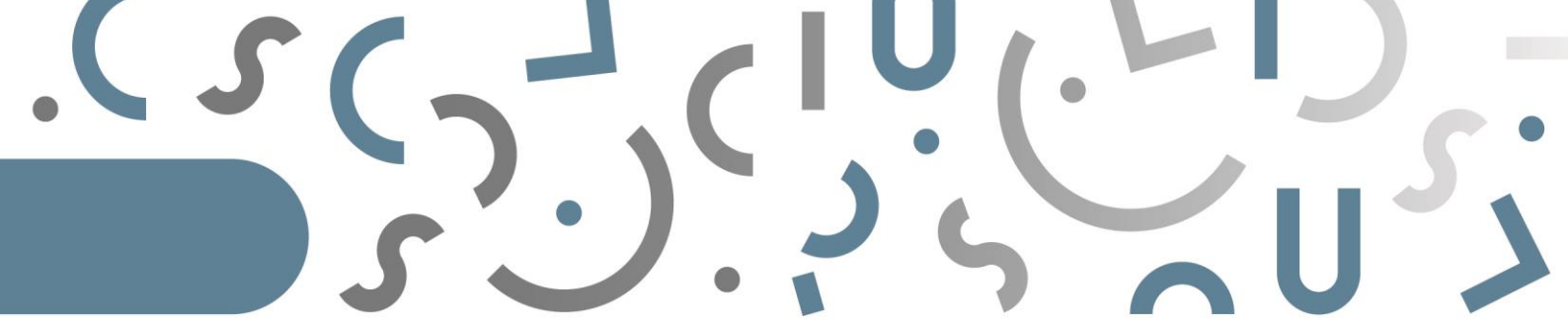
Fig.1



Fig.2



Fig.3



Next we tried to open the CTO of the RCA (Fig.4). The retrograde approach was refused due to high risk damaging the only patent LITA bypass on occluded LAD with catastrophic consequence. We considered Antegrade wire re-entry technique (AWR) inappropriate because of bifurcation of the RCA in the distal side of occlusion. We intended to do AWE strategy again. We needed the second 6F femoral approach for dual injection.

We engaged the LITA with the diagnostic IMA catheter and imaged the posterior descending branch (PDA). As an antegrade guide we used the AL 1.5 7F. The procedure was very difficult because we were unable to find the true lumen behind the occlusion (Fig.5) for a long time, using the same microcatheter as for CTO RCx, M-Cath 135 cm. During the procedure we used many dedicated CTO wires and after many attempts we crossed the occlusion and found a true lumen of the PDA (Fig.5). With the support of the guide extension (Guideliner, Vascular Solution) we also crossed the occlusion with M-Cath, and replaced the CTO wire with the workhorse wire. After stepwise predilation and implantation of three DES we obtained a good result and the bifurcation was preserved. PDA branch was long and perfused the apex of the left ventricle (Fig.6).

Conclusion

We demonstrate the case of the highly symptomatic patient after CABG and two ungrafted CTOs. PCI of the short RCx CTO was relatively simple. However, the second procedure, the CTO-PCI on the RCA was challenging. But in both procedures, the use of the M-Cath 135 long microcatheter was very helpful.

The use of microcatheter can facilitate challenging PCI, especially for the CTO antegrade or retrograde approach. For the antegrade CTO approach, the M-Cath is our favorite device. Despite having robust tip for hard lesions it has one of the smallest entry profile. Furthermore, it has high pushability and outstanding trackability. Braided shaft offers a good torquability. These features offer good properties that are helpful to do a CTO-PCI procedure more easily.

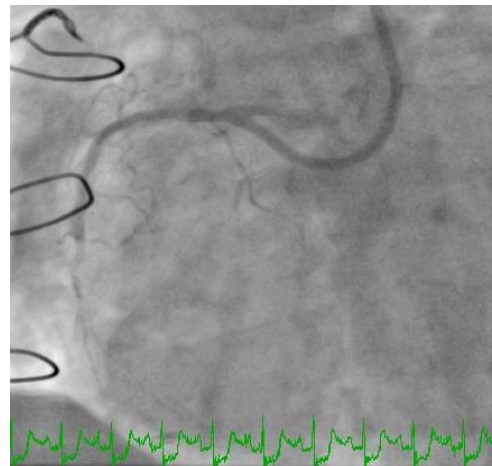


Fig.4

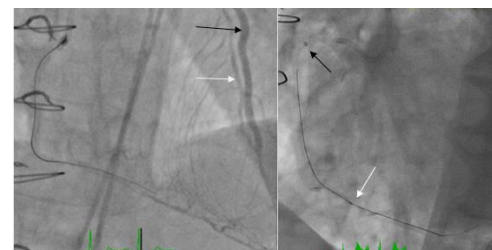


Fig.5

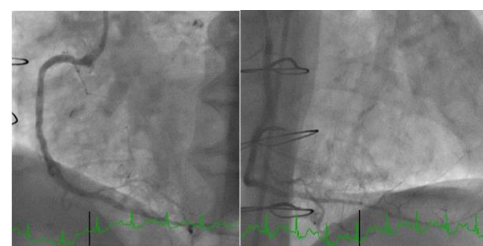


Fig.6

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