

C034

A Case of 2-stent Strategy for Proximal Left Descending Artery Bifurcation in ST Elevation Myocardial Infarction complicated by Cardiogenic Pulmonary Edema

Introduction:

Coronary bifurcation lesions are frequent and accounts for up to 20% of all percutaneous coronary interventions. The treatment of bifurcation lesions with drug-eluting stents, especially when the 2-stent technique is used, remains challenging and is associated with a higher rate of stent restenosis and thrombosis compared to non-bifurcation PCI. Although the current guidelines recommend the provisional 1-stent strategy as the preferred approach, the 2-stent strategy is a possible option for a few of complex true bifurcations.

Case:

A 65-year-old man was taken to the previous doctor by ambulance with sudden onset dyspnea that had lasted for 1 hour. Upon admission, an electrocardiogram (ECG) showed abnormal Q wave and ST elevation in leads I and aVL. Pulmonary congestion was detected in chest x-ray. Transthoracic echocardiogram (TTE) showed severely reduced wall motion in broad anterior, septum and lateral wall and left ventricular ejection fraction (LVEF) was under 40%. CPK (347 IU/L) and CK-MB (24.7 IU/L) slightly increased. He was diagnosed acute coronary syndrome with heart failure and transferred to our hospital. Systolic blood pressure kept 120mmHg and SpO₂ was 98% (BiPAP Fio₂ 60%). ECG showed ST elevation in leads V1-5 and CPK and CK-MB increased to 1156 IU/L, 176 IU/L respectively. We were aware of changing to ST elevation myocardial infarction (STEMI) and he was taken to catheterization laboratory immediately. Emergent coronary angiography (CAG) revealed the small left circumflex artery (LCx) and severe stenosis of bifurcation in descending artery (LAD) and large high lateral branch (HL). Moreover, LAD was subtotal occlusion and significant stenosis was seen also in left main trunk (LMT). Fortunately, there was no severe stenosis in main right coronary artery (RCA) and good collaterals to LAD were observed. Primary percutaneous coronary intervention (PCI) for the left coronary artery (LCA) was performed. A 6 Fr. JL3.5 guiding catheter (Hyperion) was engaged into the LCA and a guide wire SION blue was introduced through HL. Next, we tried to get guide wire SION to LAD, but couldn't. Then we used tapered guide wire XT-R followed Wizard78 with microcatheter FINECROSS, but they didn't pass the stenosis. Next, we chose GAIA first, but failed. So, we dilated HL ostium with a 2.0 mm semi-compliant balloon (Tazuna) and looked HL with intravascular ultrasound (IVUS). IVUS imaging showed LAD entry. We Used SION again and could get SION to septal branch. LAD appeared to generate from same part of septal branch angiographically, but SION wasn't directed to LAD. We thought plaque in bifurcation disturbed guidewire to LAD. We dilated septal branch ostium with 1.0mm balloon (IKAZUCHI ZERO). Then, we inserted double lumen microcatheter (Crusade K) to septal branch and tried to carry XT-R to LAD from over the wire lumen. We succeeded to pass the wire to LAD. XT-R was changed to SION blue, and LAD was dilated with previous 2.0mm balloon. TIMI 3 flow in LAD was achieved. Then LAD and HL were observed with IVUS. Consecutive plaque was seen beyond bifurcation in both arteries, we chose 2-stent strategy. Firstly, 2.75/18mm ZES (Resolute Integrity) was inserted into HL across the LAD ostium and inflated. Then stent proximal part was dilated by 4.0mm non-compliant balloon (NC Euphora). Next LAD was rewired through the strut. Stent strut was opened by 2.0mm used balloon and 3.0/26mm ZES was advanced to LAD over bifurcation

and dilated. Second stent proximal part was dilated by 4.0mm balloon and HL was rewired. Stent strut was opened by 2.0mm balloon and kissing balloon inflation was done (LAD: NC traveler 3.0mm, HL: stent balloon 2.75mm). Next third ZES (4.0/26mm) was advanced into LMT and dilated. After that, HL ostium appeared to be narrow, kissing balloon inflation was performed again. IVUS imaging showed good stent dilatation and apposition. PCI procedure was successfully finished and he was admitted to the ICU. Peak CPK was 2617 IU/L and partial ST resolution was observed. LVEF increased to 40%. He got recovered from heart failure and got off oxygen mask in five days.

Conclusions:

This is touch case using culottes technique for LAD–HL bifurcation in primary PCI for STEMI. To obtain the optimal coronary blood flow in both main vessel and side branch, a few cases like this need 2–stent strategy.