A Case of Two Vessel Acute Coronary Syndrome with CTO Lesion Successfully Treated with PCI Under Percutaneous Cardiopulmonary Support

Moto Habara
Toyoashi Heart Center, Japan

[Clinical Information]
Patient initials or identifier number:
S.Y.

Relevant clinical history and physical exam:
A 71 years old man presented to our hospital complaining of severe chest pain in the setting of inferior ST-elevation myocardial infarction (STEMI). He had no medical history except for hypertension without medication. On admission, physical examination showed low blood pressure (91/57 mmHg) and sinus tachycardia (HR 113/min). There was no pulse deficit and crackles in pulmonary auscultation.

Relevant test results prior to catheterization:
ECG showed sinus tachycardia, heart rate of 116/min, and ST segment elevation of 3-5 mm in inferior leads and depression of 3-6 mm in antero-lateral wall leads. The echocardiography showed moderate LV dysfunction (LVEF 45%). Anterior wall was moderate hypokinesia and inferior wall was akinosis. In laboratory data, cardiac enzyme was elevated (AST 56 IU/l, CK 442 IU/l, CK-MB 33.8 IU/l, and troponin I 2.01).

Relevant catheterization findings:
Right coronary angiogram showed total occlusion with thrombus at proximal portion. Left coronary angiogram showed the sever stenosis at proximal portion and the chronic total occlusion at mid portion of LAD. In addition, there was severe stenosis at mid LCX. The distal LAD was well filled through the collateral channels from the LCX and diagonal branch.

[Interventional Management]
Procedural step:
Before PCI procedure, we inserted IABP because right heart catheterization showed Forrester subset4.

A 8Fr JR4.05SH guiding catheter (Britetip®) was engaged in the right coronary. After aspiration of thrombus, deployment of filter wire and IVUS examination, predilation with Emerge® 3.0-mm balloon was performed at the mid and proximal lesions of RCA. And we deployed two drug-eluting stents (Resolute-integrity 3.0*30 mm at mid RCA, Resolute-integrity 3.5*22 at proximal RCA).

After treated RCA, he was treated at CCU. However, two hours after the index PCI, he complained severe chest pain again and blood pressure was also depressed (68/48 mmHg with IABP support). Therefore, coronary angiography was performed again. Right coronary angiography showed no significant stenosis or stent thrombosis. Left coronary angiography was not changed index CAG except high lateral branch (HLB). Although last CAG showed only mild stenosis at proximal portion of HLB, the CAG showed severe stenosis with flow delay at the portion. Therefore PCI for that lesion was performed. A 8Fr XB3.5SH guiding catheter (Britetip®) was engaged in the left coronary.

After IVUS examination and deployment of filter wire, predilation with 2% residual stenosis (MLD/ref: 3.57/3.64mm) at p-RCA, 10% residual stenosis (MLD/ref: 3.18/3.54mm) at m-RCA, 7% residual stenosis (MLD/ref: 3.40/3.65mm) at d-RCA and 6% residual stenosis (MLD/ref: 3.28/3.48mm) at very distal RCA were achieved. Patient tolerated the procedure well with no immediate complication.
Tenku® 2.25-mm balloon was performed at the proximal lesions of HLB. And we deployed one drug-eluting stent (Promus element 2.5*20mm). After the PCI, blood pressure elevated to 110/70 mmHg and right heart catheterization result was improved to Forrester subset 2.

However BP and cardiac output were gradually depressed. Therefore, 6 hours after the PCI of HLB, we decided to treat the LAD CTO lesion and LCX distal lesion under percutaneous cardiopulmonary support (PCPS). At first, we inserted PCPS via right femoral artery and vein. And a 7Fr SPB3.5SH guiding catheter (Asahi intec®) was engaged in the left coronary artery through brachial approach and the antegrade approach for LAD CTO was attempted. Initially, soft wire (Sion blue®) was advanced to 1st diagonal branch and IVUS was also advanced to detect the CTO entrance. And the Gaia1st with micro-catheter (Corsair®) was advanced to proximal CTO lesion by IVUS guidance. Although the wire could be advanced to CTO entrance, the wire could not cross the mid portion of the CTO lesion. Therefore we changed the micro-catheter from Corsair® to Crusade, and parallel wire technique with another wire (Gaia2nd) was performed. The wire successfully reached the distal part of LAD CTO lesion. After predilation with Tazuna® 2.0-mm balloon for LAD and 1st diagonal, we deployed two drug-eluting stents (Xience-prime 2.5*38mm 2.75*38) at distal to proximal LAD. And kissing balloon dilatation was performed at LAD and 1st diagonal was performed. Finally, LCX distal lesion was treated with one drug-eluting stent (Promus-element 2.25*20) and complete revascularization was finished. Two days and 7 days after the final PCI, PCPS and IABP were removed. And one month after the admission, he was discharged from our hospital.

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Everolimus-eluting Stent Fractured Case 3 Months After Percutaneous Coronary Intervention to Right Coronary Artery Chronic Total Occlusion

Keita Horitani
Osaka Saiseikai Izuo Hospital, Japan

[Clinical Information]

Patient initials or identifier number:
1118991

Relevant clinical history and physical exam:
This is 60’s gentleman known history of NSTEMI, hypertension and dyslipidemia. He had admitted to our hospital due to NSTEMI and acute pulmonary edema on Feb 2012. We performed CAG at the same day. It showed that the total occlusion in distal RCA and severe stenosis with TIMI2 flow in proximal Cx. We performed PCI to Cx on the next day of admission. After that he could get the stabilization. He was discharged from our hospital on Mar 2012.

Relevant test results prior to catheterization:
His ECG showed that there is the small q wave in inferior leads. His LVG showed that moderate hypokinesis in inferior wall. His myocardial perfusion image showed that his inferior myocardium wall had the viability.

Relevant catheterization findings:
We performed PCI to RCA CTO on Dec 2012. We could not cross the wire from antegrade so we switched the retrograde approach. We could cross the wire from retrograde and then we performed the Reverse CART technique. We opened the 2.5mm balloon into the subintimal space from the antegrade. But this balloon had pinball rupture. The coronary artery hematoma was expanded to the distal RCA because of this ruptured balloon inflation. Then we could externalization by the Reverse CART technique. After then we implanted 3Everolimus-eluting stents (EES) from RCA proximal to #4PD. We could get the good blood flow in the RCA. But the huge hematoma was left in the mid to distal RCA.

[Interventional Management]

Procedural step:
He underwent for CAG 3month after PCI to RCA CTO on Mar 5th 2013. It showed that no ISR in these stents, but there still were the huge hematoma in the distal RCA. It was smaller than previous final angiogram. There was severe stenosis in the #4AV ostium. So we performed PCI to this lesion. We tried to cross the SION blue wire to the RCA distal. But this wire couldn’t pass through the lesion. The wire was tangled with the previous stent at just after the acute marginal branch. This site had hematoma out of the stent. We tried to cross the wire to RCA distal again and we could get to cross the wire to the RCA distal. Then we checked the IVUS. It showed that the previous stent was fractured just after the acute marginal branch. But the fractured stent had no restenosis, so we didn’t touch this lesion. We performed KBT between #4AV and #4PD using 2.5mm balloons each arteries. We could get the good blood flow into the #4AV and #4PD. He underwent for restudy CAG on Jun 2013. It showed that no restenosis in all the lesion. There were good blood flow in the #4PD and #4AV.

Fractured STENT