Relevant catheterization findings:
Baseline angiogram

1. LCAG showed significant atherosclerotic lesions in proximal and mid LCX which diagnosed with vulnerable plaque and total occlusion at the bifurcation of LAD and first diagonal branch. Distal RCA was filled retrogradely from LCX. Beyond the total occlusion, the mid and distal LAD was filled retrogradely by collaterals from septal branch.

2. RCAG showed total occlusion at proximal and mid portion of RCA. Collaterals from Conus branch and RV branch, both connected to the distal septal branches beyond the CTO linked to the distal of LAD. Segment 4PD was also filled retrogradely by collateral from RV branch.

[Interventional Management]
Procedural step:

Procedure: From the results of CAG findings, we planned to perform PCI to the lesions in the LCX considered as a culprit vessel with his and his wife’s consent and started to take 300 mg cilopridogrel additionally. Guiding catheter was engaged after the weight adjusted dose of unfractionated heparin was administered, we performed PCI for LCX firstly. After IVUS examination, we implanted DES in LCX. After stents implantation, post ballooning with non-compliant balloon was performed. After balloon dilatation, LCAG showed successful in TIMI 3 flow at LCX lesions without any complications. Following PCI for LCX, we started PCI for LAD. There was no suggestion of entry point of the CTO from the angiography, we decided to perform IVUS guided PCI. Under direct IVUS guidance, a Conquest pro guide wire with Corsair micro catheter advanced into CTO lesion toward to D2. After balloon dilatation in CTO, we tried the antegrade wiring with Crusade catheter. With a landmark of IVUS, a Conquest pro guide wire with Crusade catheter was advanced into distal LAD as confirmed by contralateral injection. After that, we performed IVUS examinations in both LAD and D2. From the IVUS findings, we planned to choose the modified-T stenting strategy for this bifurcation lesion. After stents implantation by conventional technique, we performed kissing balloon technique. It was no doubt in terms of technical procedure, but unbelievable phenomenon was occurred. The filling defects in stents were recognized obviously. From IVUS imaging, thrombus formation was strongly suspected. After IVUS examination, patient got nausea and blood pressure down. Therefore we inserted IABP via left femoral artery. After that, total occlusions both coronary arteries were detected CAG, suggesting that HIT must be occurred. Therefore we did actions not only administration of Argatroban but also reload with 300 mg of cilopridogrel additionally before his consciousness was lost. After done of those, we performed various strategies of thrombectomy, balloon dilatation, long inflation of perfusion balloon and IVUS examination to both coronary arteries. However, the filling defect was remained in both stents of LAD and LCX for some time. The material retrieved by thrombosuction had the formation which we had not ever seen yet. The color was yellow with transparent, the form was elastic and soft. It differed from the usual red thrombus obviously. Therefore we decided to exchange the ongoing system which might be affected by heparin to the new system. And we administrated 200 mg of hydrocortisone at once. After changing the system, CAG showed total occlusions in distal LAD and in stent of D2, and thrombogenicity in proximal stent of LCX. After that, we inserted guide wires to each coronary, and performed various strategies of mentioned above. After done of those, the filling defects in stents of LAD were gradually diminishing. We considered that the phenomenon of acute occlusion was got well, so decided to perform kissing balloon technique again at the bifurcation of LAD. At last, we obtained good angiographical results without the filling defects.

The material retrieved by thrombosuction was diagnosed as fresh fibrinous thrombus pathologically. At later, it was revealed that heparin-PF4 complex antibody was not present in patient.

TCTAP C-109
A Case of Successful Cracking of Calcified Fibrous Cap of Totally Occluded Left Anterior Descending Artery by Using Cutting Balloon
Hidetami Ohya, Osamu Katoh
Kansui Heart Center, Japan

[Clinical Information]
Patient initials or identifier number: H.H.

Relevant clinical history and physical exam:
66-year-old male presented with dyspnea on effort and was referred to our hospital for a second attempt to recanalize the LAD CTO. He had past history of hypertension, dyslipidemia and diabetes mellitus.

Relevant test results prior to catheterization:
ECG showed slight ST-T abnormality in precordial leads.
Echocardiography showed normal left ventricular systolic function.
MDCT showed proximal LAD CTO without stump, which was supplied by collateral flow from PL branch of RCA.

Relevant catheterization findings:
CAG showed proximal LAD was totally occluded immediately after diagonal branch without stump, which was supplied by collateral flow from PL branch of RCA.

Procedural step:
PCI was performed using right femoral artery with 8-French system and contralateral injection was performed using left radial artery with 5-French diagnostic catheter. An 8 Fr guiding catheter (Hyperion SPB3.75) was engaged in the LCA. Miracle 3g and GAIA 3rd wire could not penetrate proximal cap despite the support of double lumen catheter (Crusade) or real-time IVUS guidance (Atlantis pro). IVUS from diagonal branch revealed that proximal end of CTO was fully covered with thick calcified fibrous cap. Therefore, 2.5mm cutting balloon (Flextome) was dilated over the proximal cap in expectation of modifying the calcified cap. But, there was no damage in the proximal cap by IVUS finding. Fortunately, after several times dilatation with 3.0mm cutting balloon up to 12atm, IVUS revealed longitudinal crack created in the middle of proximal cap without dissection. Subsequently, GAIA 3rd wire succeeded in entering to the CTO body through the created crack under real-time IVUS guidance. However, GAIA 3rd wire advanced into the false lumen and failed to reventy to the distal true lumen. And then, IVUS-guided parallel wire technique was taken as next strategy, balloon dilatation with 2.0mm balloon over the GAIA 3rd wire was performed to deliver the IVUS catheter. IVUS revealed the GAIA 3rd wire was located in the subintimal plane at the proximal part and extra-vessel at the distal part of the CTO lesion. Owing to integrated interpretation of IVUS and angiography, parallel GAIA 1st wire succeeded in advancing to the intimal plane and reaching to the distal true lumen. Final angiogram showed restoration of antegrade TIMI3 flow of both LAD and diagonal branch after implantation of two DES (Xience Prime).

TCTAP C-110
Successful Retrograde PCI to RCA CTO via Severe Tortuous Epicardial Channel by Using Sush® Wire
Haengnam Park
Kansui Medical University, Japan

[Clinical Information]
Patient initials or identifier number: M.T.

[Interventional Management]
Procedural step:

1. Retrograde approach
GC: 7F Launcher EBUI.75
Corsair
GW: Sion→Sion black→XTR→Sush→UB3

Sion could not advance septal channels Next, we try to cross the proximal AV channel, but we could not select. Finally, Sion advanced the distal av channel, but wire advanced the proximal av channel due to stretch the tortuous part of collateral channel. Sion black also advanced only advanced proximal channel, XTR could not stretch the tortuous part.Sush could advanced into RCA.

2. Antegrade
GC: 8F Launcher SALISH→ALISH
Corsair
GW: XTA→GAIA 1st→GAIA 2nd
Reverse CART was perfumed by 2.5mm balloon,and wire externalized by Dio support Finally Xience® 3.5*38mm implanted.
Case Summary: T.A.W.

1. Retrograde approach 1st
2. Sion could not advance septal channel and proximal av channel
3. Sion advanced the distal av channel but wire advanced into only proximal av channel due to stretch the tortuous part of collateral channel
4. Sion black also advanced into the proximal av channel
5. XTR could not stretch the tortuous part
6. Suoh could advanced into distal RCA.
7. We changed antegrade approach
8. XTR could not stretch the tortuous part
9. We changed antegrade approach
10. Xience3.5*38mm was implanted

TCTAP C-112

Preserving Non-culprit CTO Collateral with POBA (DEB) - Only Approach to Primary PCI

Julian K. B. Tan
Tan Tock Seng Hospital, Singapore

Relevant clinical history and physical exam:
1st presentation with inferior STEMI
Relevant test results prior to catheterization:
ST elevation of inferior leads
Relevant catheterization findings:
1. Thrombotic occlusion of proximal RCA
2. CTO of proximal LCX. Critical collaterals arising from branch arising from infarct site in RCA

[Interventional Management]

Procedural step:
1st procedure (Primary PCI to RCA)
Wired to distal RCA with RUNTHROUGH guidewire.
Thrombectomy of prox RCA and distal RCA with EXPORT ADVANCE, with aspiration of large amounts of clot.
Decided to "protect" conus branch, which importantly supplies collaterals to LCX CTO. Plan is for DEB-only approach to the lesion, so as not to risk compromise to conus branch.
Wired to conus branch with SION guidewire.
Predilated prox RCA with 2.5mm compliant balloon.
POBA of prox RCA with SEQUENT PLEASE 2.5*20mm DEB, up to 18atm for 60sec.
Minimal recoil and acceptable POBA result to prox RCA culprit lesion site. TIMI 3 flow preserved into conus branch, with adequate collaterals to LCX.

2nd procedure (Satged PCI to LCX CTO)
Left and right radial approach 6F.
TIGER 5F diagnostic catheter via LRA to engage RCA. EBU3.5 6F guiding catheter via RRA to engage LMCA.
Brought FINECROSS microcatheter to proximal CTO cap on RUNTHROUGH FLOPPY guidewire.
Using FINECROSS microcatheter as support in proximal LCX vessel, unable to cross CTO antegradely with PILOT 50 and GIA 2nd guidewires.
With guidance of multiple views (AP CAUDAL and straight LAO views), managed to successfully cross calcified distal cap with CONQUEST PRO guidewire.
CONQUEST PRO guidewire exchanged out for RUNTHROUGH FLOPPY guidewire.
Predilated proximal LCX with 2.0mm compliant balloon.
Stented ostial to mid LCX with SYNERGY 3.0*32mm DES, deployed at 12atm.
Postdilated LCX stent with 3.0mm noncompliant balloon, up to high pressures 16atm.
Final result for LCX excellent with no stent edge dissection and TIMI 3 flow distally.
Engaged RCA with JR4 6F guiding catheter.
Wired to mid RCA with pressure wire.
FFR of proximal RCA (previously treated with POBA/DEB) was 0.95, at maximal hyperaemia.

Case Summary:
A case demonstrating the rationale of adopting a POBA (DEB)-only approach to primary PCI, so as to preserve the critical collateral branch supplying a CTO of another vessel. After POBA (DEB) of the culprit lesion in the RCA, a successful staged PCI (3 months later) to the LCX CTO was performed, utilizing the retrograde information from the still intact collateral branch. At the end, it was also demonstrated that the previously treated (POBA) site in the RCA was haemodynamically non-significant, based on FFR measurement.
In summary, a POBA (DEB) only approach in primary PCI can result in a haemodynamically non-significant infarcted site. A POBA (DEB) only approach may be appropriate in certain situations in primary PCI, as in this case.