balloon is an angioplasty catheter with 3 longitudinal elements that produce 3 endo-
vascular optical dissecting balloon dilatation. The aim of this study was to 
evaluate plaque modification with NSE compared to those with conventional balloon 
angioplasty (POBA) using IVUS.

Methods: A total of 62 de novo coronary lesions were enrolled in this study. Patients 
were divided into 2 groups according to pre-dilatation strategy: NSE (n=32) and 
POBA (n=30). Volumetric IVUS analyses were performed for before and post-
stenting. Volume index (VI; volume/length) was calculated for vessel, lumen, and 
plaque.

Results: Vessel VI before stenting was similar between the 2 groups. For the post-
stenting vessel and peri-stent plaque VI were significantly smaller in the NSE group 
compared with the POBA group, while stent VI was similar between the 2 groups. In 
addition, serum level of creatine kinase and troponin level after stenting was not 
compared with the POBA group, while stent VI was similar between the 2 groups. In 

Conclusion: Our results demonstrate that plaque modification with NSE before 
stenting decreased vessel enlargement and increased peri-stent plaque compression 
without distal embolization compared with POBA, although stent expansion was 
similar between the 2 groups.

TCTAP A-085
What Stent Diameter Should We Select in Order to Prevent from Stent Edge 
Dissection in OCT-guide?
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Background: To get better clinical outcome, biggest stent diameter without causing 
edge dissection should be selected. Optical coherence tomography (OCT) can show 
the lumen diameter of stent landing zone precisely and also show stent edge 
dissection clearly. We investigated the stent edge lesion in relation to stent diameter 
using OCT.

Methods: From July 2012 to August 2013, we investigated 384 stent edge lesions 
with calcification treated with single 2nd generation drug-eluting stent (DES) under 
OCT guidance. Before and after deployment of DES with stent delivery balloon by 
2 or 3 times inflations, diameter and area ratios of stent edge to reference lumen 
were analyzed by OCT. We compared these between edge dissection group and 
no-dissection group.

Results: The overall incidence of edge dissection was 23 lesions (6.0%). Compared with 
no-dissection group, ratio of stent edge to reference lumen diameter (1.24 vs. 
1.12, p<0.001) and area (1.56 vs 1.26, p<0.001) were significantly larger in edge 
dissection group. Most of reference tissue character in edge dissection group was 
eccentricity (N=16(69.6%)) and lipid rich plaque (N=15(65.2%)).

Conclusion: We should select optimal stent diameter by up to quarter size-up to 
reference diameter in order to prevent from stent edge dissection.

TCTAP A-086
Quantitative Comparison of Vessel Dimensions Measured by Optical 
Coherence Tomography and Intravascular Ultrasound in 
Coronary Atherosclerotic Plaques
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Background: Optical coherence tomography (OCT) is a novel intracoronary imaging 
technique with an extremely high resolution, which is inferior to intravascular ultra-
sound (IVUS) in visualizing adventitia with lipid rich plaque because its drawbacks 
include a limited tissue penetration. This study compared the findings of OCT and 
IVUS used for the in vivo assessment of coronary lesions with lipid rich plaque.

Methods: We enrolled 80 segments with lipid rich plaque of 80 stable angina patients 
that were performed by both OCT and IVUS. The segments were classified into four 
groups according to the degree of lipid arc measured by OCT (group1: lipid arc <90; 
group2: 90<180; group3: 180<270 and group 4: 270>). The parameters (luminal area 
(lA), external elastic membrane (EEM), Plaque plus media (P&M) calculated as 
aLA subtracted from EEM), which have been evaluated independently by OCT and 
IVUS for all segments, were analyzed by using Spearman correlations and Bland- 
Altman plots.

Results: 80 segments were classified as: group1 (n=12), group2 (n=23), group3 
(n=28) and group4 (n=17). Between OCT and IVUS, there were high correlations in 
all groups of LA (group 1, 2, 3 and 4: Spearman correlation coefficient: r=0.976, 
0.985, 0.963 and 0.989, respectively; all p<0.001) and EEM (r=0.978, 0.917, 0.831 
and 0.663; p<0.001, <0.001, <0.001 and =0.005, respectively). There were signif-
icant correlations between OCT and IVUS measurements in group 1, 2 and 3 of P&M 
while there was not significant correlation in group 4 of P&M (group1, 2, 3 and 4: 
r=0.711, 0.767, 0.626 and 0.308; p=0.008, <0.001, <0.001 and 0.233, respectively).
The Bland-Altman plots indicated no evidence of systemic bias in all groups of LA 
(group1, 2, 3 and 4: 95% confidence interval(CI) = -1.3 to 0.7, -1.2 to 0.4, -1.4 to 0.9 
-1.1 to 0.5 mm, respectively), EEM (95% CI= -15.1 to 1.1, -3.2 to 2.6, -5.2 to 3.2, 
-9.2 to 4.9 mm, respectively) and P&M (95% CI= -1.1 to 1.3, -2.8 to 3.1, -5.1 to 3.5, 
-9.1 to 5.4 mm, respectively).

Conclusion: OCT might be feasible for quantitative measurements of vessel size in 
the lesion with the lipid arc of ≤3 quarters.

TCTAP A-087
Percutaneous Left Atrial Appendage Occlusion Can Be Performed Under 
Conscious Sedation Without General Anaesthesia
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Background: Percutaneous left atrial appendage occlusion (LAAO) procedure is 
typically performed with transesophageal echocardiography (TEE) guidance under 
general anaesthesia (GA). Whether the complexity of this procedure can be reduced by 
performing under conscious sedation (CS) instead of GA has not been studied.

Methods: The feasibility and safety of performing LAAO procedures in 8 patients 
(4 men, mean age 67±10) under CS with intravenous Midazolam±Fentanyl was 
studied. TEE was used to guide transseptal puncture and implantation of LAAO de-
VICES. Patients’ haemodynamic conditions and oximetry were monitored closely 
during the procedures.

Results: All patients underwent LAAO procedures successfully with CS. The 
procedural duration and fluoroscopic time were 98.6±27.1 and 14.4±5.2 minutes 
respectively. The doses of Midozolam and Fentanyl required were 5.7±2.0mg 
and 56.3±32μg respectively. There was no complications arising from the use 
of CS. Watchman and Amplatz Cardiac Plug (ACP) devices were implanted in 
4 and 3 patients respectively with a mean size of 27.6±5.2mm. One patient had 
minor migration of ACP device on day one routine TEE surveillance. The device 
was successfully retrieved percutaneously and the patient was free from any 
long-term sequelae. With a median follow-up of 15.5 months, warfarin could be 
successfully stopped in all patients and no thromboembolic complications have 
been observed.

Conclusion: LAAO procedure can be performed under CS safely. This approach will 
significantly reduce the complexity of this increasingly performed procedure.

Non-Invasive Cardiac Imaging: CTA, MRI, 
3D-Echo, and Other 
(TCTAP A-088 to TCTAP A-092)

TCTAP A-088
Validation of Stress Myocardial Perfusion Computed Tomography in 
Patients with Suspected Coronary Artery Disease Using Fractional Flow 
Reserve: Visual Assessment and Exploration of Quantitative Parameters
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Background: To assess the diagnostic accuracy of stress-induced computed tomog-
raphy myocardial perfusion imaging (CTP) in patients with coronary artery disease 
(CAD). There was lack of data on the validity of CTP for diagnosing CAD.

Methods: From 197 patients with suspected CAD receiving CTP using second 
generation dual-source CT, 75 who underwent coronary angiography and fractional 
flow reserve (FFR) for 210 epicardial arteries were selected for analysis. The diag-
nostic accuracy of visual and quantitative CTP analyses including transmural perfu-
sion ratio (TPR), myocardial density, and myocardial perfusion reserve index (CTP 

density difference between stress and rest CTP images) were assessed with the reference to hemodynamically significant stenosis, which was defined as FFR < 0.8 or angiographically tight stenosis judged prospectively by each operator. 

Results: From 210 epicardial arteries, hemodynamically significant stenosis was observed in 86 (41%) arteries. Per-vessel sensitivity and specificity of CTP by visual assessment were 80% and 95% in all patients, 87% and 100% in those with severe coronary calcium, and 75% and 90% in those with multivessel disease, respectively. From quantitative parameters, TPR showed the most accurate diagnostic performances with AUC of 0.759, sensitivity of 75%, and specificity of 71%. Mean radiation dose for CTP and CTA was 6.6 and 6.0 mSv, respectively.

Conclusion: Stress myocardial CTP appears a feasible method for identification of inducible ischemia in patients with suspected CAD. The diagnostic accuracy of CTP may be improved if both visual and quantitative analytic results are taken into account together.

TCTAP A-089
Risk of Stent Fracture, Longitudinal Compression, and In-stent Restenosis After the First- and Second-generation Drug-eluting Stent Implantation: Evaluation Using Coronary CT Angiography

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Background: to evaluate the incidence and clinical impact of stent fracture, longitudinal compression and in-stent restenosis after drug-eluting stent (DES) implantation using the coronary computed tomography (CT) angiography.

Methods: A total of 644 coronary lesions from 445 patients who underwent coronary CT evaluation following DES implantation were retrospectively enrolled. CT angiography was taken using a dual source CT (either first or second generation) scanner and was analyzed by two independent radiologists. The first- (sirolimus- and paclitaxel-eluting stents; n=368) and second- (everolimus-, biolexus-, and zotarolimus-eluting stents; n=234) generation DES were used for lesions.

Results: The incidences of all stent fracture, complete stent fracture, longitudinal compression, and in-stent restenosis were 9.6%, 3.2%, 3.3% and 2.8%, respectively.

Lesions with excessive tortuosity showed a higher incidence of stent fracture (all fracture 24.0% vs. 8.3%, p<0.001; complete fracture, 14.0% vs. 2.2%, p<0.001).

Longitudinal compression was significantly higher in ostial lesions (24.5% vs. 1.4%, p<0.001). In-stent restenosis was more frequent in a lesion with stent fracture, but the difference was not statistically different (all fracture 17.6% vs. 9.4%, p=0.472; complete fracture 5.3% vs. 2.7%, p=0.959). There was a tendency of a lower incidence of stent fracture (all fracture 9.0% vs. 10.7%, p=0.579; complete fracture 0.4% vs. 4.9%, p=0.004) and in-stent restenosis (1.3% vs. 3.8%, p=0.116), but had a higher incidence of longitudinal compression (8.1% vs. 0.3%, p<0.001) following implantation of the second-generation DES compared with the first-generation DES.

Conclusion: Coronary CT is a feasible method to detect stent fracture, longitudinal compression and in-stent restenosis after DES implantation. The second-generation DES appears to have a higher risk of longitudinal compression, but have a lower risk of complete stent fracture.

TCTAP A-090
Is Non-enhanced Cardiac Computed Tomography Valuable for Prediction of Distal Embolism During Percutaneous Coronary Intervention?

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Background: Low attenuated plaque (LAP), napkin ring sign (NRS) in coronary Computed Tomography (CT) and attenuated plaque (IVUS-AP) in intravascular ultrason (IVUS) were reported to be good predictive factors of distal embolism (DE) during percutaneous coronary intervention (PCI). However, Contrast media induce plaque CT density to be higher than in reality and small or small-dense calcification tends to be similar CT density to contrast media. Therefore enhanced CT image has some misunderstood histological diagnosis. We studied possibility of non-enhanced cardiac CT in the matter of prediction of DE during PCI.

Methods: Consecutive 79 de novo stable lesions of 56 cases which underwent ECG gated non-enhanced cardiac CT before PCI between April 2011 and November 2013 were studied retrospectively. Rotablator use, chronic total occlusion, in stent restenosis and poor CT image lesion was excluded. CT examination was performed by 64 row machine and all PCI was performed with IVUS guidance and coronary stent implantation. Plaque location was identified by comparing to coronary angiogram (CA) and suspected lesion was checked CT density by color map method. The lesion which minimum CT density is under -200HU component was defined as non-enhanced very low attenuated plaque (NE-vLAP) and over 130HU component was defined as calcium.

Results: 8 lesions (10%) had DE in this population. Positive predictive value (PPV) and negative predictive value (NPV) of NE-vLAP, NRS, and IVUS-AP were 21.6%/100%, 33.3%/95.3% and 50.0%/100%, respectively. In combination prediction of NE-vLAP+IVUS-AP, NRS+IVUS-AP, NE-vLAP+IVUS-AP and NE-vLAP+NRS+IVUS-AP were 50.0%/95.7%, 83.3%/95.9%, 66.7%/100% and 100%/95.9%, respectively.

Conclusion: Each of NE-vLAP, NRS in non-enhanced coronary CT image were good predictor of DE but inferior to IVUS-AP. Combinations of NE-vLAP+IVUS-AP and NE-vLAP+NRS+IVUS-AP improve the predictive potential of DE compared with IVUS-AP single factor.

TCTAP A-091
Effects of Left Atrial Strain on Functional Capacity in Severe Organic Mitral Regurgitation

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Background: Decreased left atrial (LA) strain was noted in patients with severe organic mitral regurgitation (MR). However, effects of LA deformation on functional capacity of patients with severe MR were not fully studied. The aim of this study was to investigate the effects of LA deformation on severity of symptoms in patients with severe organic MR.

Methods: This study recruited 110 (55% men, 57 ± 16 years) consecutive patients with severe organic MRRand preserved left ventricular systolic function who underwent echocardiography in the outpatient clinic. LA deformation including strain and strain rate were assessed by two-dimensional speckle tracking echocardiography with commercialized software. Global peak LA longitudinal strain (LASL), peak strain rate in reservoir phase(LASRr), and in conduit phase (LASRc) were identified from strain and strain rate curves. Severity of heart failure symptoms were evaluated by New York Heart Association (NYHA) functional classification.

Results: There were 35 (32%) patients in NYHA I, 62 (56%) in NYHA II, and 13 (12%) in NYHA III. Age (50 ± 13, 60 ± 17, 65 ± 16 years; p = 0.004) presence of