TCT-375

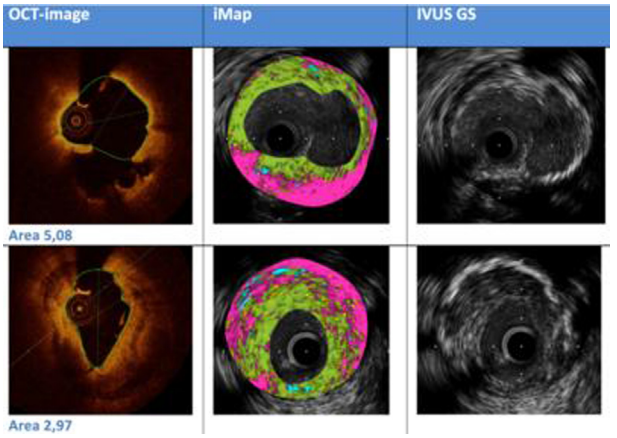
Incidence and History of Coronary Dissections and Plaque Ruptures in ST Elevation Myocardial Infarction assessed by Optical Coherence Tomography

Mikkel Hougaard[1], Henrik S. Hansen[1], Per Thayssen[1], Anders Junker[1], Lisbeth Antonsen[1], Lisette Okkels Jensen[1]
[1]Department of Cardiology, Odense University Hospital, Odense, Denmark

Background: Primary percutaneous coronary intervention (PPCI) is the mainstay treatment for patients with ST segment elevation myocardial infarction (STEMI). Occurrence of later need for repeated revascularization may in some cases rely on conditions such as edge dissections or uncovered plaque ruptures already present shortly after the PPCI. Using optical coherence tomography (OCT) we examined the incidence of plaque ruptures and edge dissections in a single-center STEMI cohort with follow-up after 12 months.
Methods: 86 patients admitted with first time STEMI was included and had OCT of the implanted drug eluting stent performed during the primary admission and 82 patients had repeated OCT after 12 months of follow-up.
Results: Target lesion revascularization was performed in 2 patients due to stenosis in the area of an uncovered plaque rupture.

	Baseline	12 months	p-value
Plaque ruptures n (%)	12 (14.0%)	N/A	
Proximal n (% of ruptures)	8 (66.6)		
Thrombotic (% of ruptures)	8 (66.6)		
Mean cavity area (mm^2)	1.9 (±1.5)	0.1 (±0.2)	0.18
Mean length (mm)	3.0 (±1.9)	2.3 (±2.6)	0.11
Minimum luminal area (mm^2)	7.0 (±3.7)	5.9 (±4.2)	0.01
Patients with Dissections n (%)	14 (16.3)	2 (2.3)	N/A
Number of Dissections n	18	2	
Proximal n (% of dissections)	5 (27.8)	2 (100)	
Submedial penetration n (% of dissections)	9 (50)	1 (50)	
Mean Length (mm)	3.5 (±2.6)	6.7 (±1.8)	0.66
Mean Minimal lumen area (mm^2)	4.4 (±2.5)	4.2 (±2.4)	0.20

Conclusions: In a cohort of STEMI patients, non-covered thrombotic plaque ruptures were identified in 8 patients (9.3%) and might contribute to the risk of vessel restenosis. Coronary dissections are a frequent finding but heal in most cases without causing further significant restenosis.



TCT-376

Impact of lipid rich plaque assessed by optical coherence tomography at the stent edge on edge restenosis after everolimus-eluting stent implantation

Yasushi Ino[1], Takashi Kubo[1], Yasutsugu Shiono[1], Yoshiki Matsuo[1], Yamano Takashi[1], Tomoyuki Yamaguchi[2], Makoto Orii[2], Kunihiro Shimamura[1], Takashi Tanimoto[1], Kumiko Hirata[1], Atsushi Tanaka[1], Takashi Akasaka[1]
[1]Wakayama Medical University, Wakayama, Japan, [2]Wakayama Medical University, Wakayama, Japan

Background: Previous study have reported that the longitudinal geographic miss including incomplete lesion coverage at the stent edge was associated with an increased incidence of binary restenosis, target lesion revascularization (TLR) and myocardial infarction after the 1st generation drug-eluting stent (DES) implantation. Previous intra vascular ultrasound studies reported that plaque burden of post-stenting reference segment predicted edge restenosis after the 1st and 2nd generation DES implantation. However, an association between plaque type at stent edge and edge restenosis has not been evaluated yet. The aim of the present study was to assess whether there is an association between plaque type assessed by optical coherence tomography (OCT) and edge restenosis after the 2nd generation everolimus-eluting stent (EES) implantation.
Methods: 161 patients (185 lesions) who underwent OCT-guided EES implantation and 9-12 months scheduled follow-up coronary angiography (CAG) were enrolled. Plaque type at stent edge were assessed by OCT. Angiographic edge restenosis was defined as diameter stenosis >50% at the follow-up CAG within 5 mm of the proximal and distal edges of the stent.
Results: Distal and proximal edges were visible by serial OCT (post stenting and follow-up) in 178 and 171 edge segments, respectively. Plaque type at stent edge was: lipid rich 18.3%, fibrotic 50.4%, fibrocalcific 15.5% and normal segment 15.8%. The incidence of edge restenosis was 4.0 % (14 of 349 edge segments) : 14.1%, 1.7%, 3.7%, and 0% in lipid rich plaque, fibrotic plaque, fibrocalcific plaque, and normal segment, respectively ($p< 0.001$).
Conclusions: Lipid rich plaque at the stent edge has an impact on edge restenosis after EES implantation.

TCT-377

Multimodality intravascular imaging assessment of plaque erosion vs plaque rupture in patients with acute coronary syndrome

Hoyoun Won[1], Sang Wook Kim[1], Gary S. Mintz[2], Young Joon Hong[3], Sung Yun Lee[4], Ki Seok Kim[5], Young Kim[1], Jee Eun Kwon[1], Seonghyeop Hyeon[6], Seung Yong Shin[1], Kwang Je Lee[1], Wang Soo Lee[1], Tae Ho Kim[1], Chee Jeong Kim[1]
[1]Chung-Ang University Hospital, Seoul, Korea, Republic of, [2]Cardiovascular Research Foundation, Washington, United States, [3]Heart Research Center, Chonnam National University Hospital, Gwangju, Korea, Republic of, [4]Inje University Ilsan Paik Hospital, Goyang-si, Korea, Republic of, [5]Jeju National University Hospital, Jeju, Korea, Republic of, [6]Chung-Ang universtiy hospital, Seoul, Korea, Republic of

Background: We used optical coherent tomography (OCT) and virtual histology intravascular ultrasound (VH-IVUS) to assess culprit lesions in 146 Korean pts with acute coronary syndrome (ACS).
Methods: Culprit lesion plaque rupture (PR) or plaque erosion (PE) was diagnosed with OCT; and IVUS was used to determine arterial remodeling. PE (n=56) was the presence of intracoronary thrombus attached to the luminal surface with no detectable signs of fibrous cap rupture that was seen in 90 ACS pts with PR. Positive remodeling was a remodeling index (lesion/reference EEM [external elastic membrane] area) >1.05.
Results: Pt age was 60±12 yrs in PR and 62±11 yrs in PE; 19% of PR vs 18% of PE were females. Overall, 25% (14/56) of PE had non-ST elevation myocardial infarction (NSTEMI) and 34% (19/56) had STEMI; conversely, 14.4% (13/90) of PR had NSTEMI and 71% (64/90) had STEMI ($p< 0.0001$). Vessel size, minimal lumen area, and lumen area at the PR or PE site were similar; however, lesion length was longer in PR (Table). Plaque area was smaller with negative remodeling in PE while PR showed positive remodeling with a larger necrotic core area by VH-IVUS (Table). By OCT, PE were fibrotic in 50% (28/56), fibrocalcific in 16% (9/56), and lipidic in 32.1% (18/56, all but one of which was a thick cap fibroatheroma).

	Plaque Rupture (n=90)	Plaque Erosion (n=56)	P value
Lesion length (mm)	18.31±7.87	14.84±5.46	0.003
Distal reference lumen area (mm^2)	7.46±3.17	7.31±2.86	0.769
Minimal lumen area (mm^2)	3.19±1.67	3.83±2.80	0.94
Rupture vs erosion sites			
EEM (mm^2)	18.09±6.39	15.69±7.24	0.076
Lumen area (mm^2)	6.39±2.77	7.04±3.19	0.276
Plaque area (mm^2)	11.62±5.61	8.16±4.21	0.0003
Plaque burden (%)	63.08±12.68	52.16±17.25	0.0004
%Fibrotic area	57.25±12.82	64.33±93.93	0.596
%Fibrofatty area	8.79±7.03	14.37±16.04	0.023
%Necrotic core area	25.69±1.92	16.73±13.26	0.0002
%Dense calcium	8.25±8.79	7.04±9.94	0.513
Remodeling Index	1.09±0.25	0.91±0.45	0.013
Positive remodeling (%)	42.5	14.3	0.0004

Conclusions: Multimodality intravascular imaging with OCT and VH-IVUS showed fundamentally different pathoanatomic substrates underlying plaque rupture and erosion in Asian pts.