TCT-360
Impact of Tissue Protrusion Assessed by Optical Coherence Tomography on Early Stent Thrombosis in Patients with ST Elevation Myocardial Infarction

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BACKGROUND The efﬁcacy of stent have been established in patients undergoing primary percutaneous coronary intervention (PCI) for ST-segment elevation myocardial infarction (STEMI). However, early stent thrombosis in STEMI patients remains a clinical problem. We used optical coherence tomography (OCT) to assess the impact of abnormal ﬁndings after stent implantation such as tissue protrusions and stent malapposition on early stent thrombosis in patients with primary PCI for STEMI.

METHODS We studied 110 patients, including 9 with early stent thrombosis after primary stenting with OCT-guidance and 101 matched control subjects without early stent thrombosis.

RESULTS Although minimum stent area was similar between 2 groups (6.73 ± 1.89 mm2 vs. 6.80 ± 1.95 mm2, p = 0.695), minimum lumen area within stent was signiﬁcantly smaller in the early stent thrombosis group (5.35 ± 1.51 mm2 vs. 5.82 ± 1.92 mm2, p = 0.037). Maximum acute stent malapposition area was similar between 2 groups (0.92 ± 1.21 mm2 vs. 0.88 ± 1.35 mm2, p = 0.725). Maximum tissue protrusion area was signiﬁcantly larger in the early stent thrombosis group (2.55 ± 1.37 mm2 vs. 1.04 ± 0.92 mm2, p < 0.01).

CONCLUSIONS Larger tissue protrusion but not acute malapposition after stent implantation were related to early thrombosis after primary PCI for STEMI.

CATEGORIES IMAGING: Intravascular

KEYWORDS IVUS, OCT, Target lesion revascularization

TCT-362
Assessment of Bioresorbable Scaffold With a Novel High-Deﬁnition 60MHz IVUS Imaging System: Comparison With Conventional 40MHz IVUS and Optical Coherence Tomography

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BACKGROUND The novel 60MHz High-Deﬁnition IVUS (HD-IVUS) has been shown to be superior to conventional 40MHz IVUS in plaque evaluation with advantages of IVUS over optical coherence tomography (OCT) in entire vessel wall evaluation without the need for blood removal during imaging. Its higher image acquisition rate also enables high-speed pullback imaging to reduce procedural time. This study aimed to evaluate the feasibility of 60MHz HD-IVUS with conventional and high-speed pullbacks in quantitative and qualitative assessment of bioresorbable scaffold (BRS) as compared with 40MHz IVUS and OCT.

METHODS In this in vivo swine study, scaffold area, incomplete strut apposition (ISA) and strut fracture were independently analyzed with the 3 modalities in 39 matched cross-sections from 2 BRS (3.0x18 mm and 3.5x12 mm) deployed in the coronary arteries (left anterior descending and right coronary arteries). To evaluate the scaffold ISA, each BRS was deployed at nominal pressure in an arterial segment slightly larger than the nominal device size. Each BRS was then over-inﬂated at high pressure to create strut fractures. Using motorized pullback, HD-IVUS imaging was performed at 0.5 mm/s and was repeated at 10 mm/s. In each modality, strut fracture was identiﬁed as discontinuity of the scaffold struts.

CONCLUSIONS Combined use of IVUS and OCT during PCI may offer clinical beneﬁt after PCI as compared with a single use of such modalities. This beneﬁcial effect is probably afforded by appropriate stent sizing and optimal stent expansion based on the detailed lesion assessment during PCI.

CATEGORIES IMAGING: Intravascular

KEYWORDS IVUS, OCT, Stent lesion revascularization

TCT-361
Combined use of intravascular ultrasound and optical coherence tomography during percutaneous coronary intervention may reduce target lesion revascularization after percutaneous coronary intervention

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BACKGROUND The clinical utility of invasive imaging guidance for percutaneous coronary intervention (PCI) has been repeatedly reported. Little is known, however, about whether the combined use of intravascular ultrasound (IVUS) and optical coherence tomography (OCT) during PCI may offer long-term clinical beneﬁt as compared with PCI performed under single modality-guidance.

METHODS From the Kobe university OCT registry, we enrolled a total of 321 lesions (241 patients) who underwent PCI with OCT and IVUS during primary PCI for STEMI. Lesions were classiﬁed into 3 groups according to the type of imaging device used for the index procedure: IVUS-guided group: n = 160, OCT-guided group: n = 53, Combination group (both IVUS and OCT were used): n = 108. Long-term clinical follow-up was performed to evaluate target lesion revascularization (TLR) for the average duration of 27.9±17.7 months after stenting.

RESULTS Baseline patient and lesion characteristics showed that Combination group had a signiﬁcantly larger percentage of stable angina patients and shorter stent length as compared with other groups. Otherwise, there was no statistical difference among the groups. Mid-term follow-up OCT analysis showed that Combination group had a tendency toward larger minimum stent area than the other groups (IVUS: 5.53±1.96 mm2, OCT: 5.23±1.70 mm2, Combination: 5.90±2.15 mm2; P = 0.11, respectively) without a signiﬁcant difference in stent edge dissection and residual stenosis. Also, Combination group had a signiﬁcantly larger minimum lumen area than other two groups (IVUS: 4.36±1.86 mm2, OCT: 4.30±1.87 mm2, Combination: 4.93±2.27 mm2; P<0.05). Among these patients population, TLR was observed in 30 lesions. The incidence of TLR in the combination group was signiﬁcantly lower than that in the IVUS or OCT group (10.6% vs. 17.0% vs. 3.7%, P = 0.02, respectively). After adjusting confounding parameters, multivariate logistic regression analysis showed that, in addition to statin use, and BMS use, the combined use of IVUS and OCT was independently associated with less incidence of TLR (OR 0.225, P = 0.014).

CONCLUSIONS Combined use of IVUS and OCT during PCI may offer clinical beneﬁt after PCI as compared with a single use of such modalities. This beneﬁcial effect is probably afforded by appropriate stent sizing and optimal stent expansion based on the detailed lesion assessment during PCI.

CATEGORIES IMAGING: Intravascular

KEYWORDS IVUS, OCT, Stent lesion revascularization