TCT-310

Short- and long-term clinical impact of tissue protrusion after second-generation drug-eluting stent implantation for acute coronary syndrome

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BACKGROUND Stent implantation may be associated with tissue protrusion (TP), especially in patients with acute coronary syndrome (ACS), but its long-term clinical outcome is unknown. The aim of this study was to evaluate the clinical outcome of ACS patients with TP after second-generation drug-eluting stent (DES) implantation.

METHODS We retrospectively evaluated 366 consecutive ACS patients who underwent primary percutaneous coronary intervention (PCI) with a second-generation DES at Nagoya Heart Center. All culprit lesions underwent pre- and post-PCI intravascular ultrasound (IVUS) and were classified according to the presence or absence of post-stent TP.

RESULTS After primary PCI, 198 lesions (54.1%) displayed TP on IVUS. The incidence of IABP insertion and additional procedures, such as additional prolonged ballooning and thrombectomy after stent implantation to reduce the amount of TP, were significantly higher in patients with TP. Multivariate regression analysis demonstrated that the pre-plaque volume more than 300 mm3 was the only independent predictor of TP (OR=2.262, p-value=0.001).At 12-month follow-up, the incidence of TLR did not differ between the patients with and without TP. The incidence rates of late catch-up phenomenon and recurrence of ACS (r-ACS) over the 36.0-month follow-up were higher in patients with TP than in patients without TP (late catch-up: 11.1% vs. 5.9%; Log lank test; p = 0.081, r-ACS: 7.1% vs. 2.4%; Log lank test; p = 0.043). Cox proportional hazard analysis showed that triple vessel disease (HR=9.258, p = 0.001), TP (HR=3.149, p = 0.008), and reduction rate of low-density lipoprotein cholesterol ≥ 50% (HR=0.184, p = 0.004) were the only independent predictors of r-ACS.

	protrusion (-), N=168	protrusion (+), N=198	p-value
Age	64.8±10.1	63.9±10.0	0.641
Male, %	82.1	82.8	0.485
STEMI, %	78.0	82.8	0.445
Initial TIMI 0/1, %	65.5	67.7	0.117
Positive remodeling, %	50.0	56.1	0.146
Attenuation plaque, %	86.9	90.9	0.146
Additional procedure, %	4.8	15.2	0.001
IABP insertion, %	13.7	22.2	0.042
Peak CK, U/L	1913±1782	2439±2015	0.075

CONCLUSION IVUS-detected TP after DES implantation may be associated with worse clinical outcomes at long-term follow-up, although TP was not associated with worse short-term clinical outcomes.

CATEGORIES CORONARY: Acute Coronary Syndromes

TCT-311

A novel experimental thrombotic myocardial infarction and primary angioplasty model in atherosclerotic swine

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BACKGROUND We sought to develop a reproducible, percutaneous basic science and translational animal model for the generation of thrombotic occlusion acute myocardial infarction (AMI) in adult atherosclerotic pigs to simulate human conditions.

METHODS A vascular coil COOK TORNADO® (COOK MEDICAL) 38 inches (3-3.5 x 20-50 mm) was placed in the right coronary artery (RCA) or the left anterior descending artery (LAD) in 26 downsized spontaneously hypercholesterolemic pigs and left untreated until a thrombotic intracoronary occlusion was present. After the angiographic confirmation of total occlusion, we proceeded to crossing the newly formed thrombotic occlusion with a guidewire J ES, followed by pre-dilatation with a semi compliant balloon, thrombus visualization with Optical Coherence Tomography (OCT) imaging and, finally, deployment of a stent and repeated OCT. After revascularization, we calculated the index of microcirculatory resistance (IMR) in order to estimate microvascular obstruction. AMI was confirmed by ECG, biochemical, histological, macroscopic examination and TTC imaging in all animals.

RESULTS After a feasibility phase (6 animals), acute thrombotic occlusion was achieved in all 20 pigs. Eighteen animals were successful revascularized and survived until the previously selected time for sacrifice. Time to occlusion after coil placement was 69±29 min, thrombus formation was confirmed by OCT images, thrombin-antithrombin complexes (TAT) measurements and pathology examination. Myocardial necrosis was confirmed by troponin I elevation, myocardial staining and pathology examination. Distal thrombotic embolization and microvascular obstruction were supported by increased IMR and pathology examination.

CONCLUSION A porcine model of thrombotic occlusion AMI in miniaturized adult spontaneously atherosclerotic pigs is feasible by percutaneous intracoronary placement of a coil. The reperfusion by angioplasty completed this model which mirrors human pathological conditions with myocardial infarction, necrosis and distal embolization in atherosclerotic adult pigs. Our model closely simulates human presentation of AMI and can be used to evaluate antithrombotic agents and primary angioplasty techniques.

CATEGORIES CORONARY: Acute Myocardial Infarction

TCT-312

The Impact of Platelet-Fibrin Clot Strength and Endogenous Fibrinolytic Activity on Adverse Cardiac Events After Percutaneous Coronary Intervention in Patients with Coronary Artery Disease

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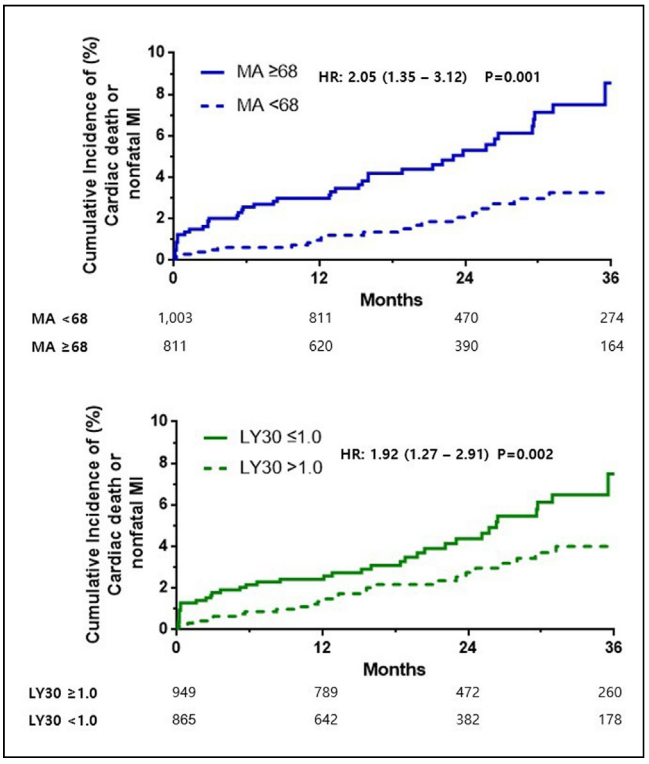
BACKGROUND The level of platelet reactivity is associated with major adverse cardiovascular events (MACE) in CAD patients undergoing PCI. However, the impact of clot strength and endogenous fibrinolytic activity on MACE post-PCI remains uncertain.

METHODS We evaluated 1,814 patients who underwent PCI and measured coagulation profiles using thromboelastography (TEG®) during PCI. TEG® system indicates "Platelet-Fibrin Clot Strength" (MAthrombin: maximal amplitude of the clot dynamics) and endogenous fibrinolytic activity (LY30: percentage of the clot lysis at 30 min) together. MACE was defined as a composite of cardiac death and nonfatal myocardial infarction.

RESULTS During the follow-up (median, 23 months), the occurrence of MACE significantly differ among patients with and without high "Platelet-Fibrin Clot Strength" (MAthrombin ≥ 68 mm) (8.8% vs. 3.8% at 3 years; HR, 2.05; 95% CI, 1.35 to 3.12; p = 0.001). Likely, patients with low fibrinolytic activity (LY30 < 1.0%) were at a greater risk for MACE, as compared with those with high fibrinolytic activity (8.1% vs. 4.4% at 3 years; HR, 1.92; 95% CI, 1.27 to 2.91; p = 0.002). These influences were maintained even after adjustment with known clinical and procedural variables. In addition, the combination of MAthrombin (≥ 68 mm) and LY30 (< 1.0%) significantly increased the predictive value for MACE occurrence by about 4-fold.



CONCLUSION This study is the first to show the clinical impact of clot strength and endogenous fibrinolytic activity on MACE after PCI in CAD patients, which may indicate that coagulation profiles can be important risk factors for atherothrombotic events in these patients.

CATEGORIES CORONARY: PCI Outcomes

RADIATION EXPOSURE - I

Abstract nos: 313 - 317

TCT-313

Lens Changes Associated with Radiation in the Cardiac Catheterization Laboratory: An Update from the IC-CATARACT (CATaracts Attributed to Radiation in the CaTh Lab) Study

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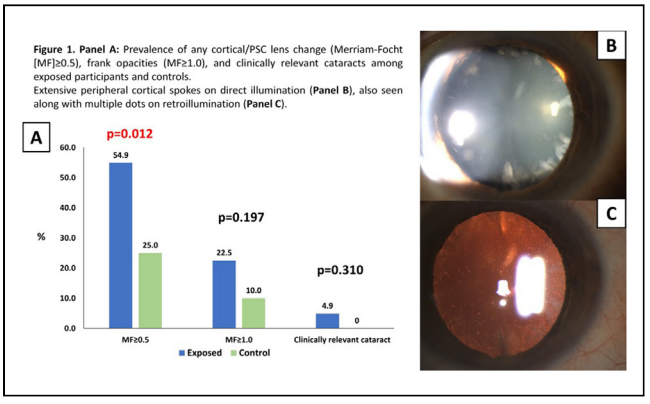
BACKGROUND Exposure to ionizing radiation is associated with the development of lens opacities. We examined the relationship between occupational exposure to ionizing radiation and the prevalence of lens changes in interventional cardiologists (ICs) and catheterization laboratory ("cath-lab") staff.

METHODS We conducted a cross-sectional study at an interventional cardiology conference for two consecutive years (2016 and 2017). Study participants completed a questionnaire about occupational exposure to radiation and potential confounders for the development of cataracts, followed by slit-lamp examination and grading of lens findings.

RESULTS A total of 162 participants were examined: 88% had occupational radiation exposure (49.5± 11 years-old, 83% men) and 12% were unexposed controls (37.7 ± 12 years-old, 60% men). The prevalence of cortical and posterior subcapsular lens changes was higher in exposed participants as compared with controls (55% vs. 25%, p=0.012) based on the Merriam-Focht (MF) scale. The following factors were independent predictors of lens changes: occupational exposure (odds ratio [95% CI]: 4.98 [1.30-25.58] p=0.018); age 40-60 years (OR 3.48 [CI 1.45-8.95] p=0.0049); age > 60 years (OR 16.90 [CI 4.73-71.67] p<.0001); and female gender (OR 3.37 [CI (1.27-9.63] p=0.014). The prevalence of frank opacities (23% vs. 10%, p=0.197) and clinically relevant cataracts (4.9% vs. 0%, p=0.310) were similar between the two groups; however, all the clinically relevant cases were in the exposed group.



CONCLUSION ICs and cath-lab staff have a higher prevalence of lens changes as compared with unexposed controls, highlighting the importance of minimizing staff radiation exposure.

CATEGORIES OTHER: Public Health Issues

TCT-314

Implementation of noise reduction technology to reduce patient radiation dose in chronic total occlusion percutaneous coronary interventions: a propensity-matched analysis

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BACKGROUND Chronic total occlusions (CTO) percutaneous coronary intervention (PCI) is associated with high radiation exposure for both patients and operators. Our study aim was to evaluate the impact of the implementation of a noise reduction technology (NRT) on patient radiation exposure during CTO PCI.

METHODS A total of 187 CTO PCIs performed between February 2016 and May 2017 was analyzed according to two angiographic systems, Standard and NRT. Propensity score matching (PSM) was performed to control for differences in baseline clinical and angiographic characteristics. Standard group and NRT group were matched (1:1 ratio) by age, sex, body mass index, contrast volume, fluoroscopy time, number of cine acquisitions, use of 7.5 frames-per-second setting, and Japanese-CTO (J-CTO) score. The study primary endpoints were Cumulative Air Kerma at Interventional Reference Point (AK at IRP),