

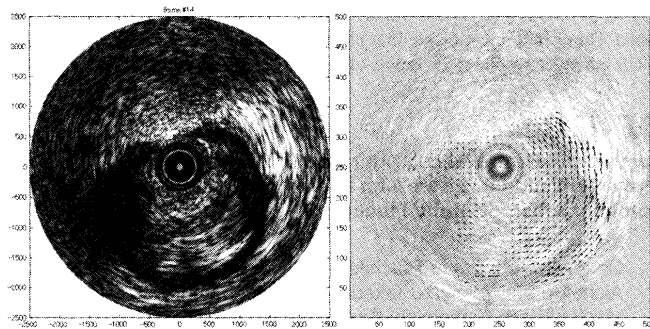


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### OE-423

#### Relation between Various Risk Factors and Tissue Characterization of Atherosclerosis in Coronary Arteries (An Integrated Backscatter Intravascular Ultrasound Study)

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**Background.** It is well known that the degree of risk to coronary heart disease is different among various risk factors. The purpose of the present study is to clarify the relation between risk factors and coronary tissue characterization using integrated backscatter intravascular ultrasound (IB-IVUS) which we developed. **Method & Results.** We analyzed 29 angina-related coronary segments with angiographically significant stenosis ( $\geq 75\%$  stenosis) of 29 patients with angina pectoris. In IB-IVUS analysis, radio-frequency (RF) signals were obtained by an IVUS system using a 40MHz catheter. The patients were divided into 2 groups based on the presence or absence of each of 3 risk factors, diabetes mellitus (DM), hypertension (HT), hyperlipidemia. The DM group had significantly greater % area of lipid cores modified by the area of intima ( $33.9 \pm 12.9\%$ ) compared with the non-DM group ( $24.5 \pm 6.7\%$ ). The low HDL group had significantly greater % area of lipid core ( $34.7 \pm 12.5\%$ ) and lesser % fibrosis area ( $23.9 \pm 8.3\%$ ) compared with the high HDL group ( $24.5 \pm 7.2\%$  and  $36.8 \pm 4.9\%$ , respectively). However, there was no significant difference in other risk factor groups. **Conclusions.** The presence of greater lipid core and/or lesser fibrosis in DM and low HDL-cho may reflect higher risk of these risk factors to coronary heart disease. This provides a new clinical insight on the relation between risk factor and coronary atherosclerosis.

### OE-424

#### Preprocedural Serum and Morphological Markers for Angioscopic Stent Edge Injury

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Stent edge restenosis occurs even in drug eluting stent era and angioscopy can detect directly stent edge injury (SEI) including thrombus and dissection. The purpose of this study was to clarify the preprocedural markers for stent edge injury that was correlated with neointimal hyperplasia. Angioscopic evaluation of stent edge was performed in consecutive 48 stent edges soon after stent implantation. Just before stent implantation, we evaluated lesion morphology (remodeling) using intravascular ultrasound (IVUS) and serum markers, which were high sensitive C-reactive protein (hs-CRP), fibrinogen (FBG), total cholesterol (TC), triglyceride (TG), high-density lipoprotein cholesterol (HDL), fasting blood sugar (FBS) and hemoglobin A1c (HbA1c). Positive remodeling was defined as remodeling index (RI)  $> 1.05$ . RI was calculated as follows: lesion vessel area / average of proximal and distal reference vessel area. SEI was defined as angioscopic detection of thrombus or dissection at stent edge. As a result, there were 6 SEI (5 with thrombus) in which 5 SEI (83%) revealed restenosis 6 months after stent implantation. The value of hs-CRP and rate of positive remodeling in SEI group was significant higher than non SEI group ( $1.85 \pm 1.85$  vs  $0.42 \pm 0.68$ ,  $62\%$  vs  $23\%$ , both  $p < 0.05$ ) while the others showed no significant differences. **Conclusion:** Preprocedural inflammation and positive remodeling at the target lesion was correlated with SEI that was marker for restenosis.

## Transplantation (M)

### OE72

March 21 (Mon)

Room 8 (416+417, Conference Center)

15 : 35 - 16 : 50

### OE-425

#### Effect of Sympathetic Reinnervation on Exercise Performance after Heart Transplantation

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**Background:** Sympathetic reinnervation of the transplanted heart may occur, however, little is known about the effect of reinnervation on exercise performance, especially in Japanese recipients. **Subjects and Methods:** Subjects consisted of 13 Japanese heart transplant (HTx) recipients (16 to 55 years old, 7 females), whose underlying heart disease was dilated cardiomyopathy in 8, dilated phase of hypertrophic cardiomyopathy in 2, restrictive cardiomyopathy in 2, and ischemic cardiomyopathy in 1 patient. We quantified the extent of myocardial reinnervation by using  $^{123}\text{I}$ -MIBG scintigraphic imaging to determine heart-to-mediastinum ratio (HMR). To evaluate exercise tolerability after HTx, gas exchange during treadmill exercise test was analyzed. **Results:** 1) Myocardial MIBG uptake was apparent in the anterior myocardial region. 2) HMR were correlated with % peak  $\text{VO}_2$  and heart rate (HR) response during exercise ( $R=0.65, 0.51$ , respectively). 3) No correlation was seen between HMR and the time since HTx. 4) Peak  $\text{VO}_2$  was correlated with HR response, maximum HR, and time duration of exercise ( $R=0.74, 0.69, 0.82$ , respectively). 5) 3 of 4 patients who showed relatively low HMR ( $\leq 1.45$ ) demonstrated lower QOL. **Conclusions:** In Japanese HTx recipients, the restoration of sympathetic innervation was associated with improved exercise tolerability, HR response and QOL. These results support the functional importance of reinnervation in transplanted hearts.

### OE-426

#### A Nonviral Gene Transfer Using Ultrasound-Microbubble Has Enhanced the Transfection Efficiency of NF- $\kappa$ B Decoy into Murine Cardiac Allografts

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Although experimental trials of decoy transfection using viral vector have been successful, there are still unresolved problems for human gene therapy such as low transfection efficiency and safety. Thus, it is necessary to develop safe and efficient nonviral gene transfer methods. As therapeutic ultrasound induces cell membrane permeabilization, ultrasound irradiation might increase the transfection efficiency of the decoy into transplanted hearts. To clarify the transfection efficiency of the decoy using ultrasound with echo contrast microbubble, we used murine cardiac transplant models. We studied the *ex vivo* transfection efficiency of FITC-labeled decoy using the ultrasound-microbubble method into harvested murine hearts. The decoy transfected hearts were transplanted into recipient mice abdomens; all hearts kept beating throughout the observation periods. Two weeks after transfection, FITC-labeled decoy in transplanted isografts using ultrasound was significantly increased as compared with the FITC-labeled decoy alone. We examined the feasibility of NF- $\kappa$ B decoy using the ultrasound-microbubble method. NF- $\kappa$ B decoy transfection into cardiac allografts significantly prolonged graft survival and suppressed graft arterial diseases without any tissue damage in the allografts or systemic adverse effects of the recipients. The ultrasound transfection method enhanced the transfection efficiency of the decoy. *Ex vivo* transfection of the NF- $\kappa$ B decoy by the ultrasound-microbubble method could be clinically useful for safe gene therapy to prevent cardiac rejection without a viral vector system.