**USEFULNESS OF OPTICAL COHERENCE TOMOGRAPHY IN CLINICAL PRACTICE IN PATIENTS WITH CORONARY ARTERY DISEASE**

**T. Akasaka**, T. Kubo, A. Tanaka, H. Kitabata, Y. Ino, T. Tanimoto, K. Hirata,

T. Imanishi

Wakayama Medical University, Wakayama, Japan

Recently developed frequency domain optical coherence tomography (OCT) is an optical analogue of intravascular ultrasound (IVUS), which provides more than 5 cm high-resolution images of the coronary arteries up to 10 micrometer during 3 seconds contrast flushing through a guiding catheter. OCT allows us to demonstrate coronary lesion morphologies in detail including tissue characterization. Even in acute coronary syndrome (ACS), OCT can differentiate the lesion morphology between ST elevation and non-ST elevation myocardial infarction including types of plaque (fibrous, lipid-rich and calcified), plaque disruption (rupture or erosion), thrombi (red, white and mixed thrombi), and fibrous cap thickness and the frequency of thin-capped fibroatheroma (TCFA), as described in the histological examinations. Furthermore, clinically silent plaque disruption and non-ruptured TCFA, which is thought to be a main precursor of ACS and vulnerable plaque, can be also demonstrated by OCT not only in culprit but also in non-culprit vessels. Moreover, OCT may demonstrate the different mechanisms of late stent thrombosis in bare metal stent (BMS) and drug-eluting stent (DES) by the findings of the rupture of new TCFA within neointima in BMS and the findings of malapposition without tissue coverage with thrombus in DES. These OCT findings in vivo in human may provide us new insights into the etiology and pathophysiology of coronary artery disease (CAD) beyond histology and evolve us new therapeutic strategies in CAD in the near future for predicting and preventing ACS and for improving prognosis of CAD.