Coronary Artery Distensibility and Plaque Composition Determined by Virtual Histology-IVUS

-Comparison among Stable Angina Pectoris, Old Myocardial Infarction and Acute Myocardial Infarction-

Osamu Sasaki, Toshihiko Nishioka, Michiko Minai, Ami Isshiki, Yoshiro Inoue, Aki Kaneda, Kentarou Toyama, Toshiyuki Ando, Mikio Yuhara, Shinichi Sato, Nobuyuki Masaki, Tetsuaki Kamiyama, Masato Kirimura, Hiroyuki Ito, Yoshiaki Maruyama, Masayuki Hada, Nobuo Yoshimoto

Division of Cardiology, Saitama Medical Center, Saitama Medical University. Kawagoe, Japan


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Abstract

Objectives: The purpose of this study was to assess the difference in coronary artery distensibility and plaque composition determined by Virtual Histology-IVUS among non-culprit lesions of stable angina pectoris (SAP), old myocardial infarction (OMI) and acute myocardial infarction (AMI).

Methods: One-hundred thirty cross sectional areas (CSA) of 20 non-culprit de novo coronary artery lesions from 20 SAP patients, fifty-eight CSAs of 10 non-culprit de novo coronary artery lesions from 10 OMI patients and 128 CSAs of 30 non-culprit de novo coronary artery lesions from 30 AMI patients were imaged by IVUS (Volcano Therapeutics) with simultaneous intracoronary pressure (ICP) recording. Systolic and diastolic lumen areas (LA), vessel areas (VA), and plaque areas (PA) were measured.

Lumen diameters (LD) were calculated with an assumption that the cross section was circular. Plaque burden (PA / VA) X100, coronary compliance (LA change/diastolic LA) / (LD change/diastolic LD) were calculated at each site. Color tissue maps were reconstructed from radio frequency data using IVUS-Virtual Histology software.

Coronary compliance, Stiffness index β (SI β); {ln (systolic ICP/diastolic ICP) / (LD change/diastolic LD)} were measured among AMI, OMI and SAP groups.

Conclusions: Coronary atherosclerosis assessed by Virtual Histology-IVUS was more advanced and severe, and coronary distensibility was impaired even in non-culprit lesions of AMI and OMI groups compared to those of SAP group.

References

1. Coronary plaque composition of nonculprit lesions, assessed by in vivo intracoronary ultrasound radio frequency data analysis, is related to clinical presentation, Rodriguez GA et al. Am Heart J 2006;151:1020-4