

### Correlation between carotid intima-media thickness and virtual histology using IVUS in silent left main coronary artery disease

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**Introduction:** Carotid intima-media thickness (cIMT) was used as a surrogate marker for prediction of atherosclerosis. Intravascular ultrasound (IVUS) and its derived modality, virtual histology (VH), were established as a complementary tool to coronary angiogram. The aim of the study was to examine any correlation between these two methods in patients with silent left main coronary disease (LMCD) requiring percutaneous intervention (PCI) to other coronary stenosis.

**Methods:** Patients with an angiographically 'normal' looking LM undergoing PCI to the LAD or LCx artery would receive an IVUS examination. Silent LMCD was defined as 'normal' LM by angiogram and yet significant sub-intimal disease (luminal area loss >20%) by IVUS. Patients fulfilling these criteria were enrolled. cIMT parameters (bulb, internal and common arteries on both sides) were measured, using IE33 auto-edge detection program. IVUS-VH data were obtained by the Volcano system. Plaque burden (area obstruction in mm<sup>2</sup> at narrowest segment) was also measured. Measurements of either method were obtained in a blind fashion. Pearson correlation coefficient was used for statistical analysis and a P value of  $\leq 0.05$  was considered significant.

**Results:** Twelve patients with silent LM disease (mean age, 67.4 $\pm$ 9.6 years; 8 men) were enrolled to date. cIMTs were within normal limits in all patients, with a mean of 0.65 $\pm$ 0.11 mm. IVUS-measured mean LM luminal area was 13 $\pm$ 3.75 mm<sup>2</sup> and mean plaque burden was significantly high at 51 $\pm$ 6.9%, despite the 'normal'-looking LM by angiogram. The mean percentages of various VH morphologies, fibrous, fibro-fatty, necrotic core and calcium were 58.5 $\pm$ 10.15%, 24.0 $\pm$ 11.9%, 11.2 $\pm$ 11.2% and 6.3 $\pm$ 6.4%, respectively. No significant correlation was found between the cIMT and the plaque burden, nor the four types of VH morphology.

**Conclusions:** cIMT is not able to predict the presence of silent LM coronary disease as revealed by IVUS and VH. There is no correlation between cIMT and IVUS plaque burden and VH morphologies.

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### Survival from cardiovascular events as predicated by carotid (common carotid artery) intima-media thickness and Doppler values in ischaemic Chinese patients requiring coronary angiogram

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**Introduction:** Carotid intima-media thickness (cIMT) of the common carotid artery may be correlated to the presence of coronary artery disease. However, the role of the cIMT and Doppler findings in predicting subsequent cardiovascular events has not been established. The aim of this study was to investigate the predictive value.

**Methods:** A total of 212 consecutive Chinese patients undergoing clinically driven coronary angiogram were evaluated. Carotid parameters (cIMT, peak systolic velocity [PSV] and end diastolic velocity, at the bulb, internal and common carotid artery, on both sides) were analysed using the IE33 auto-detection program. Patients were followed up and monitored for the occurrence of the primary composite end-point (PCEP), defined as all cardiovascular deaths, non-fatal MI, stroke, CHF, ACS or arrhythmias requiring hospitalisation or intervention.

**Results:** To date, the mean follow-up time was 534 $\pm$ 234 days. The PCEP was reached in 25 subjects (11.8%). The right common cIMT was shown to be a predictor for critical coronary stenosis requiring PCI (area under ROC curve=0.626, P=0.001). cIMT <0.8 mm was associated with a better survival (log rank test, P=0.029). Univariate analysis, a right common cIMT of  $\geq 0.8$ mm, the right common carotid PSV, and the waist circumference were independent predictors for the PCEP. Cox proportional hazards model adjusted for age showed the right common carotid PSV was the only independent predictor for the PCEP (HR=0.963; 95% CI, 0.939-0.987, P=0.002). Similar correlations were not observed with the overall (left and right) cIMT or the left cIMT in this study.

**Conclusion:** The right common carotid PSV and the right common cIMT  $\geq 0.8$  mm are shown to predict the cardiovascular survival in this study. The latter also strongly correlates with the presence of critical coronary stenosis requiring intervention.