



## **The Annual Vulnerable Patient Meeting**

### **Daily Report: 2<sup>nd</sup> day**

*Reykjavik Iceland,*

The second day of the Vulnerable Patient meeting began with a review of results obtained with new systems for invasive coronary artery imaging. During the 13 years that the VP meeting has occurred, invasive imaging has advanced. Several multi-modality catheters, which combine probes with different imaging capabilities, have also been developed. Such catheters can provide information on the structure and lipid content of coronary plaques, as well as the degree of obstruction to flow that is present. These emerging imaging modalities are now being evaluated in outcomes trials for their ability to identify vulnerable plaques and patients. Positive outcomes trials will facilitate prevention of second events in patients already undergoing a catheterization for a first event.

Dr Takashi Akasaka from the Wakayama Medical University in Japan presented results of the ESCORT trial, a study in coronary patients of the potential stabilization of vulnerable plaques with statin therapy. OCT measures showed changes compatible with thickening of the cap over presumably dangerous lipid cores. Dr. David Erlinge reported that a near-infrared spectroscopy (NIRS) coronary catheter identified cholesterol deposits in the lesions causing coronary events. Dr. Farouc Jaffer described progress in developing a catheter capable of detecting various molecules in coronary plaques. While the coronary imaging catheters are providing new views of coronary lesions, they are invasive and their use is restricted to patients already undergoing a catheterization for an initial coronary event. Prevention of the first coronary event will require development of non-invasive imaging methods suitable for use as a screening tool.

Dr. Udo Hoffmann reported that non-invasive multislice computed tomography (MSCT) can identify patients likely to experience a coronary event, even in the absence of a significant

coronary narrowing. Dr. Jouke Smink demonstrated that magnetic resonance imaging, which does not expose the patient to radiation, can also detect asymptomatic atherosclerosis. However, MRI is best used for evaluation of carotid plaques which are near the surface and not moving.

Dr. Jolanda Wentzel reviewed progress with the study of slow coronary blood flow (leading to low shear stress) as a stimulus for the development of lipid-rich coronary plaques. Dr. Peter Stone presented for the first time an analysis of the PROSPECT study in which computational fluid dynamic techniques were used to estimate the endothelial shear stress as a technique to identify high risk coronary plaques. Dr. Christos Bourantas reported that low shear stress can also predict the formation of high-risk vulnerable plaque within a stent that can lead to stent failure.

The session concluded with an in-depth discussion among clinicians and bioengineers about the technical modifications, processing advances and software developments needed to make measurements of shear stress easily available to clinicians working in the catheterization laboratory.

There was general agreement that both invasive and non-invasive methods to characterize coronary artery disease are steadily improving, and that such improvement makes it more likely that vulnerable plaques and patients can be identified.

