INCOMPLETE THREE-VESEL INTRAVASCULAR IMAGING IN THE PROSPECT TRIAL: IMPLICATIONS FOR PRE-EMPTIVE VULNERABLE PLAQUE DETECTION

PROSPECT (Providing Regional Observations to Study Predictors of Events in the Coronary Tree) was a multicenter, multimodality imaging study designed to prospectively identify vulnerable plaque after treatment of all culprit lesions in pts presenting with acute coronary syndromes. The protocol specified that all 3 coronary arteries - both culprit and non-culprit lesion containing vessels - be studied with angiography, intravascular ultrasound (IVUS), and virtual histology (VH)-IVUS after successful PCI, including imaging of the proximal 6-8cm of each major epicardial artery with IVUS/VH-IVUS.

Results: All 697 enrolled pts had analyzable 3-vessel angiograms, but only 615 (88%) had analyzable IVUS/VH-IVUS in whom the average number of imaged vessels was 2.84±0.50, the average number of analyzable vessels was 2.57±0.64, and the average analyzable vessel length measured 193±82 mm. Reasons for incomplete IVUS/VH-IVUS were equally clinical (operator decision not to perform IVUS or not to image all 3 arteries) and technical (failure of image acquisition or recording of study, failure of the pullback device, etc). Overall, 8% of pts had only 1 analyzable artery, 27.4% of pts had 2 analyzable arteries, and 64.6% of pts had 3 analyzable arteries. At 3-year follow-up there were 107 non-culprit lesion (vulnerable plaque) events; however, IVUS/VH-IVUS imaging at enrollment was performed in only 51 of these 107 non-culprit lesions (48%).

Conclusions: Despite a prospective, specific, carefully-designed, and investigator agreed-upon protocol and the use of mature, commercially available catheters and systems, incomplete intravascular imaging was common (25%) As a result of incomplete imaging, as well as events in small arteries not imaged routinely, more than 50% of lesions that developed future non-culprit events did not have IVUS/VH-IVUS imaging at baseline. The reality of incomplete intravascular imaging must be factored into sample-size calculations of future studies designed to detect and treat vulnerable plaques.