

SCA 124**ENDOTHELIAL DYSFUNCTION PREDICTS ADVERSE EVENTS AFTER OFF-PUMP CORONARY ARTERY BYPASS GRAFTING**

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Introduction: Endothelial dysfunction (ED) is associated with potentially injurious abnormalities in coronary vasomotion and/or coagulation. Assuming no technical graft defects, measured flow in the newly placed coronary bypass grafts likely reflects that of the target coronary bed. Although coronary ED has been shown to predict adverse events, this correlation has not been specifically established in coronary surgery patients. We hypothesized that a "point-of-care" analysis of ED with LIMA graft flow reserve and perioperative platelet function would predict adverse events after off-pump coronary bypass (OPCAB).

Methods: 27 OPCAB patients that each received a LIMA-to-LAD arterial graft were prospectively evaluated (n=88 total bypass grafts). Intravenous heparin (target ACT 250 seconds) during grafting and oral aspirin (ASA 325mg) pre-, peri-, and postoperatively were the only anticoagulants administered. The LIMA graft was analyzed intraoperatively for blood flow, pulsatility index (PI) and percent of diastolic flow (% DF) using transit time methodology (Transonic, Inc.). Hyperemic flow reserve was determined by assessing LIMA flow before and after a 20-second occlusion. Hypercoagulability was defined by platelet function on Thrombelastography™ (maximum amplitude >70mm), whole blood aggregometry (>15 ohms) or hemoSTATUS™ (channel 5 clot ratio >110% normal) prior to OPCAB, at case completion, on postoperative day (POD) #1 or #3. ECG-gated, multislice CT coronary angiography (CTA) was performed on POD#5 to determine early graft patency (see

figure). A composite endpoint of death, acute renal insufficiency (creatinine rise >1.0mg/dl), stroke (defined by neurological examination and head CT), and early venous bypass graft failure (by CTA) was determined.

Results: 10 out of 27 patients demonstrated ED with hypercoagulability and a hyperemic flow reserve of <1.5. All grafts had PI <4.0 and %DF >60 suggesting no technical defects. ED was associated with an increase in the rates of death (10 vs. 0%), stroke (10 vs. 0%), early bypass graft failure (30 vs. 11%), and acute renal insufficiency (20 vs. 0%) with the composite endpoint significantly greater than in those patients without ED (p<0.05, Fischer's exact test).

Conclusion: LIMA flow reserve and in vitro platelet function tests described provide a "point-of-care" analysis of ED that correlates with adverse clinical events. Routine ED assessment may help identify those patients who would benefit from enhanced antiplatelet therapy or endothelial resuscitation to reduce their risk of significant and unwanted adverse outcomes.

