

SCA 1

OFF PUMP CORONARY ARTERY BYPASS GRAFTING IS NOT ASSOCIATED WITH A HYPERCOAGULABLE STATE

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Introduction: Concerns regarding early venous bypass graft patency have tempered initial enthusiasm for off-pump coronary artery bypass grafting (OPCAB). The lack of a validated in vitro test of hypercoagulability has prevented an elucidation of the role that a hypercoagulable state after OPCAB may play in this increased early graft thrombosis. In this study, the influence of OPCAB on in vitro platelet response to thrombin, platelet activating factor, and collagen was determined using thrombelastography (TEG™), hemoSTATUS™, and whole blood aggregometry and correlated with early venous bypass graft patency.

Methods: 38 OPCAB patients that received 70 venous bypass grafts with aspirin (ASA) given pre-, peri-, and postoperatively were evaluated prospectively. Hypercoagulability was defined by TEG (maximum amplitude [MA] >70mm), whole blood aggregometry (>15 ohms after 5 mcg/ml collagen) or hemoSTATUS (channel 5 clot ratio >0.5) prior to OPCAB, at case completion, on postoperative days (POD) #1 and #3. Bypass graft blood flow was analyzed intraoperatively using transit time technology. Flow between 10-25cc/min was classified as n despite revision (n=2) suggests a technical defect or inappropriate target and led to exclusion of the measured graft from further analysis. Segments of vein used for each bypass were analyzed for endothelial disease defined by an increased expression of PAI-1 and tissue factor and reduced levels of TPA and thrombomodulin in homogenates/frozen sections. ECG-gated, multichannel CT coronary angiography (Phillips Medical) was performed on POD#5 to determine graft patency by an independent thoracic radiologist.

Results: As illustrated in the figure, postoperative platelet function declined relative to preoperative levels immediately after surgery and on POD#1, returning to normal on POD#3. In addition, no differences in any of the 3 platelet function assays were noted for the 7 patients with graft thrombosis (n=7 grafts) vs. the 31 patients with all patent grafts (n=63 grafts). Although the incidence of marginal graft flow (85 vs. 46%), and procoagulant vein phenotype (71 vs. 48%) were also not different between groups, a combined abnormality in all three parameters was seen in 5 of 7 patients with graft thrombosis vs. 8 of 31 patients with all patent grafts (p<0.04, Fisher exact test).

Conclusions: OPCAB was not associated with a postoperative hypercoagulability as defined by the 3 platelet function assays used in this ongoing study. However, in the presence of marginal graft flow and procoagulant vein phenotype, a postoperative hypercoagulability demonstrates an association with early vein graft thrombosis. Active assessment of this triad offers the opportunity to manage risk and optimize the result of surgical coronary revascularization for individual patients.

