

Abstracts from the 2011 Western Vascular Society Annual Meeting

Gender-Based Differences in the Inflammatory Profile of Peripheral Arterial Disease and Their Association with Outcomes of Lower Extremity Vein Bypass Surgery

Jade S. Hiramoto, MD,^a Christopher D. Owens, MD,^a Ji Min Kim,^a Michael Belkin, MD,^b Mark A. Creager, MD,^b and Michael S. Conte, MD,^a ^aDivision of Vascular Surgery, University of California – San Francisco, San Francisco, Calif; and ^bBrigham and Womens Hospital, Boston, Mass.

Objective: To determine if there are gender-based differences in the inflammatory phenotype of patients undergoing lower extremity bypass (LEB) surgery and if they correlate with clinical outcomes.

Methods: Two hundred twenty-five patients (161 men and 64 women) underwent LEB using the autogenous vein between February 2004 and May 2008. Fasting baseline blood samples of inflammatory and pro-thrombotic biomarkers were obtained before surgery. All patients underwent ultrasound scan graft surveillance. High-sensitivity C-reactive protein (CRP) levels were dichotomized at 5 mg/L, and fibrinogen levels were dichotomized at 500 mg/dL. All patients were followed for a minimum of 1 year; median follow-up was 893 days (interquartile range [IQR], 539-1315 days).

Results: There were no significant differences in age, race, hypertension, diabetes mellitus, and coronary artery disease between male and female patients. Men were more likely to be smokers ($P = .003$), hyperlipidemic ($P = .02$), and taking statins ($P = .02$). Women were more likely to present with critical limb ischemia ($P = .03$) and had higher baseline CRP levels (median, 5.15 mg/L; IQR, 1.51-18.62 mg/L) compared to men (median, 2.70; IQR, 1.24-6.98 mg/L; $P = .03$). In a multivariable analysis, female gender ($P = .03$), hypertension ($P = .01$), estimated glomerular filtration rate (eGFR; $P = .02$), and critical limb ischemia ($P < .001$) were associated with log-transformed CRP levels. In a multivariable Cox Proportional Hazards model for primary vein graft patency, there was a significant interaction between both gender and CRP ($P = .03$) as well as gender and fibrinogen ($P = .08$). Women with CRP < 5 mg/L were significantly more likely to lose primary vein graft patency compared to women with CRP < 5 mg/L ($P = .003$), whereas there was no such difference seen in men ($P = .62$). Women with fibrinogen ≥ 500 mg/dL were also more likely to lose primary graft patency compared to women with fibrinogen < 500 mg/dL ($P = .04$), but again, this pattern was not evident in men ($P = .66$).

Conclusions: Women undergoing LEB for advanced peripheral arterial disease (PAD) have an elevated inflammatory phenotype compared to men. Elevated baseline levels of CRP and fibrinogen are associated with inferior vein graft patency in women, but not in men. These findings suggest an important interaction between gender and inflammation in the healing response of lower extremity vein bypass grafts.

Viabahn Treatment for Femoropopliteal Occlusive Disease: Relationship between Implant Length and Clinical Outcomes

Paul C. Johnston, MD,^{a,b} Sara J. Runge, MD,^c Linda M. Reilly, MD,^c Jade S. Hiramoto, MD,^c Charles M. Eichler, MD,^c Christopher M. Owens, MD,^c Darren B. Schneider, MD,^{c,d} and Michael S. Conte, MD,^c ^aDepartment of Vascular Surgery, University of California San Francisco, San Francisco, Calif; ^bDepartment of Vascular Surgery, Kaiser Permanente Medical Group, Denver, Colo; ^cUniversity of California San Francisco, San Francisco, Calif; and ^dColumbia-Cornell University, New York, NY.

Objective: Optimal patient selection for revascularization approaches in femoropopliteal occlusive disease (FPOD) remains controversial. Covered stent placement in the femoropopliteal (FP) segment has become increasingly prevalent. There is little information regarding the influence of implant length on the clinical performance of these devices.

Methods: This was a retrospective, single-center study of 89 consecutively treated limbs (78 patients) that underwent Viabahn stent graft placement for FPOD from 2005 to 2010. Procedures were dichotomized according to the total length of the implanted devices using a cutpoint of 20 cm. Freedom from reintervention, thrombolysis, open bypass surgery, and composite major adverse limb events (MALEs = major amputation, thrombolysis/thrombectomy, or open bypass surgery) were compared by log-rank analysis. Logistic regression was used to model clinical endpoints.

Results: Thirty-eight percent of grafts were placed for critical limb ischemia (CLI), 51% in diabetics, and 31% were reinterventions. Total implant length was > 20 cm in 55 patients (62%). Estimated 1-year event rates for the two groups (20 cm) were as follows: any reintervention (40% vs 50%; $P = .7$), thrombolysis (0% vs 27%; $P = .014$), open bypass (13% vs 22%; $P = .33$), and MALE (14% vs 35%; $P = .068$). Implant length was independently predictive of need for thrombolysis ($P < .01$) and MALE

($P = .053$) on multivariate logistic regression. Indication (claudication vs CLI) was not predictive of thrombolysis or MALE.

Conclusions: Rates of reintervention after Viabahn treatment for FPOD are considerable. The risk of MALEs is strongly associated with total implant length and is driven by thrombolysis. These data have implications for surgical decision-making in FPOD.

Comparing Patency and Salvage Rates between Multiple Ipsilateral Iliac Artery Stents and Isolated Iliac Artery Stents: Beyond Trans-Atlantic Inter-Society Consensus II

Rachel C. Danczyk, MD, Erica L. Mitchell, MD, Sharon G. Kryger, Chad Burk, Sarguni Singh, Timothy K. Liem, MD, Gregory J. Landry, MD, James M. Edwards, MD, Bryan D. Petersen, MD, and Gregory L. Moneta, MD, Division of Vascular Surgery, Oregon Health and Science University, Portland, Ore.

Objectives: Endovascular stents are accepted therapy for TransAtlantic Inter-Society Consensus (TASC) A, B, and some C lesions. Surgery is the recommended therapy for patients with TASC D lesions, including those with both ipsilateral common iliac artery (CIA) and external iliac artery (EIA) stenoses/occlusion. This study compares anatomic patency and operative salvage rates for combined ipsilateral CIA and EIA stenting (TASC D) vs CIA or EIA stents alone (TASC A, B, or C).

Methods: All patients ($n = 588$) who underwent iliac artery stenting at two institutions between 1998 and 2010 were identified. Patient comorbidities and outcomes were retrospectively reviewed and analyses were performed using multivariate regression and Kaplan-Meier methods.

Results: There were 436 extremities with CIA stents, 195 with EIA stents, and 157 with both CIA and EIA stents. There was no significant difference in demographics, comorbidities, or treatment indications between groups. During follow-up, 183 patients died, 95 underwent endovascular reintervention, and 48 required salvage operation. Mean times to follow-up, death, reintervention, and operative salvage were 2.2 ± 0.1 , 5.6 ± 0.3 , 7.2 ± 0.6 , and 9.6 ± 0.5 years, respectively. CIA and EIA stenting in combination was not a predictor of death, reintervention, or salvage operation. Survival, reintervention-free survival, and salvage operation-free survival were similar between those who had CIA or EIA stents alone and those with both CIA and EIA stents (all $P > .05$).

Conclusions: CIA stents, EIA stents, and the combination of ipsilateral CIA and EIA stents have similar outcomes. Salvage operations for iliac artery stent failure are uncommon and not influenced by the location or extent of iliac artery stent placement. This study suggests that a more aggressive approach with total endovascular management for some TASC D lesions is acceptable. TASC II recommendations for endovascular therapy for aortoiliac disease should be extended to consider selected patients with ipsilateral CIA and EIA stenoses/occlusion.

The Number of Patent Tibial Vessels does not Influence Primary Patency after Nitinol Stenting of the Femoral and Popliteal Arteries

Jenny Lee, MD,^c and Steven G. Katz, MD,^{a,b} ^aDepartment of Vascular Surgery, University of Southern California Surgeons, ^bthe Department of Medical Education, Huntington Hospital, and ^cthe Department of Surgery, Huntington Hospital, Pasadena, Calif.

Objective: Initial TransAtlantic Inter-Society Consensus (TASC) II classification has been shown to influence the patency of stented femoral and popliteal arteries. While several studies have shown the effect of the number of runoff vessels on the durability of infrainguinal angioplasty without stenting, the influence of tibial vessel runoff on the patency of primarily stented femoral and popliteal arteries has not been as well defined. It is the purpose of this study to determine whether the number of patent tibial vessels affects primary patency after primary stenting of the femoral and popliteal arteries.

Methods: The medical records of all patients undergoing angioplasty and primary nitinol stenting of the femoral and popliteal arteries by or under the supervision of a single vascular surgeon were reviewed. Results were analyzed by the number of patent tibial vessels documented on periprocedural angiography and TASC II classification. Kaplan-Meier survival curves were plotted and differences between groups tested by log-rank method. Fisher's exact and χ^2 tests were used to compare categorical factors.

Results: During a 7-year period, 316 limbs in 262 patients underwent primary stenting of the femoral and popliteal arteries. Overall primary patency was 71% at 12 months, 51.6% at 24 months, and 39.5% at 36