

Selected Abstracts from the July Issue of the Journal of Vascular Surgery and the Journal of Vascular Surgery: Venous and Lymphatic Disorders[☆]

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Selected Abstracts from the Journal of Vascular Surgery

Type II endoleak prevention with coil embolization during endovascular aneurysm repair in high-risk patients

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Objective: This study evaluated endoleak level and size decrease of infrarenal abdominal aortic aneurysm (AAA) after endovascular aneurysm repair (EVAR) with coil embolization in patients at high risk for type II endoleak.

Methods: Between 2009 and 2013, 83 of 187 patients (44.3%) who underwent EVAR for AAA also underwent coil embolization of the aneurysm sac immediately after complete stent graft release because of risk factors for type II endoleak, including absence of a circumferential thrombus, two or more pairs of patent lumbar arteries, or a patent inferior mesenteric artery. Coil embolization was achieved using a 4F catheter with a microcatheter placed between the stent graft and the aneurysm wall. Computed tomography and color duplex ultrasound imaging were performed 1, 6, 12, and 24 months later to look for an endoleak and assess aneurysm sac diameter.

Results: Mean follow-up was 24 ± 11 months (range, 6-53 months). A mean of 12 coils (range, 4-23) was used. Technical success was achieved in all patients, with no procedurally related complications. Follow-up computed tomography showed type II endoleak in one patient. Aneurysm sac diameter was significantly decreased after 6 months ($P = .001$), 12 months ($P = .001$), and 24 months ($P = .001$). Surgery was required in one patient for common femoral artery occlusion unrelated to the procedure and in another patient for distal type I endoleak.

Conclusions: Aneurysm sac coil embolization during EVAR for patients at risk for type II endoleak is technically feasible, safe, and effective in preventing type II endoleak. This procedure leads to rapid AAA shrinkage. Thus, coil embolization could be used routinely to improve EVAR outcomes for patients at risk for type II endoleak.

Objective: Although placement of an open iliac conduit for endovascular aortic aneurysm repair (EVAR) is generally felt to result in higher morbidity and mortality, published literature is scarce. Our objective was to assess 30-day outcomes after elective EVAR with an open iliac conduit using a multi-institutional database.

Methods: Patients who underwent elective EVAR ($n = 14,339$) for abdominal aortic aneurysm were identified from the American College of Surgeons National Surgical Quality Improvement Program 2005 to 2011 database. Univariable and multivariable logistic regression analyses were performed.

Results: An open iliac conduit was used in 231 patients (1.6%), and the remainder had femoral exposure or percutaneous EVAR. Women comprised 32% of patients with iliac conduits in contrast to 17% of those without iliac conduits. Patients with iliac conduits were older and had a lower body mass index. Univariable analysis showed patients with open iliac conduits had a higher incidence of postoperative pneumonia (3.0% vs 1.1%), ventilator dependence (4.8% vs 1.0%), renal failure (3.0% vs 0.7%), cardiac arrest or myocardial infarction (5.2% vs 1.1%), return to the operating room (9.1% vs 3.7%), major morbidity (16.0% vs 6.6%), and death (3.0% vs 0.9%). On multivariable analysis, the use of open iliac conduits was associated with higher risk of 30-day mortality (odds ratio, 2.7; 95% confidence interval, 1.2-6.0) and 30-day major morbidity (odds ratio, 2.3; 95% confidence interval, 1.6-3.3).

Conclusions: Patients with open iliac conduits for EVAR are more likely to be female and have higher postoperative morbidity and mortality. For patients with complex iliac artery disease, conduits are a viable alternative after EVAR to be performed, albeit at an increased risk. These data do suggest the need for lower-profile grafts and other alternative strategies for navigating complex iliac artery disease.

Morbidity and mortality after use of iliac conduits for endovascular aortic aneurysm repair

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Race as a predictor of delay from diagnosis to endarterectomy in clinically significant carotid stenosis

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Objective: Prompt carotid endarterectomy (CEA) in clinically significant carotid stenosis is important in the prevention of neurologic sequelae. The greatest benefit from surgery is obtained by prompt revascularization on diagnosis. It has been demonstrated that black patients both receive CEA

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less frequently than white patients do and experience worse postoperative outcomes. We sought to test our hypothesis that black race is an independent risk factor for a prolonged time from sonographic diagnosis of carotid stenosis warranting surgery to the day of operation (TDO).

Methods: From 1998 to 2013 at a single institution, 166 CEA patients were retrospectively reviewed using Synthetic Derivative, a de-identified electronic medical record. Factors potentially affecting TDO, including demographics, preoperative cardiac stress testing, degree of stenosis, smoking status, and comorbidities, were noted. Multivariate analysis was performed on variables that trended with prolonged TDO on univariate analysis ($P < .10$) to determine independent ($P < .05$) predictors of TDO. Subgroup analyses were further performed on the symptomatic and asymptomatic stenosis cohorts.

Results: There were 32 black patients and 134 white patients studied; the mean TDO was 78 ± 17 days vs 33 ± 3 days, respectively ($P < .001$). In addition to the need for preoperative cardiac stress testing, black race was the only variable that demonstrated a trend with ($P < .10$) or was an independent risk factor for ($P < .05$) prolonged TDO among all patients ($B = 42$ days; $P < .001$) and within the symptomatic ($B = 35$ days; $P = .08$) and asymptomatic ($B = 35$ days; $P = .003$) cohorts. On Kaplan-Meier analysis, black patients in each stratum of symptomatology (all, symptomatic, and asymptomatic patients) experienced prolonged TDO (log-rank, $P < .03$ for all three groups).

Conclusions: Black race is a risk factor for a temporal delay in CEA for carotid stenosis. Awareness of this disparity may help surgeons avoid undesirable delays in operation for their black patients.

Outcomes of infrainguinal bypass determined by age in the Vascular Study Group of New England

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Background: Many believe extremes of age correlate with poorer outcomes in treatment for lower extremity peripheral arterial disease (PAD). We hypothesized that the youngest patients would have significantly poorer outcomes compared with older cohorts due to the precocious nature of their PAD.

Methods: We studied all patients in the Vascular Study Group of New England database undergoing infrainguinal bypass for PAD between 2003 and 2013. Age was grouped by <50 years, 50 to 79 years, and ≥ 80 years. Our primary outcomes were 1-year freedom from a major adverse limb event (MALE), defined as ipsilateral amputation or need for secondary intervention, and amputation-free survival. A second analysis was performed to analyze the subgroup of patients aged <50 years with critical limb ischemia (CLI), which included a Cox regression model to determine risk factors for MALE or death at 1 year.

Results: Of 5265 patients who were treated with infrainguinal bypass for PAD, 324 (6.2%) were aged <50 years. The

mean age was 44.6 years, and 66.4% were male. The proportion of African Americans was significantly higher in the youngest age group (<50 years: 6.8% vs 50-79 years: 3.5%, $P = .002$; vs ≥ 80 years: 3.5%, $P = .013$). More bypasses were done for claudication than acute limb ischemia in patients aged <50 years (33.3% vs 11.4%). More vein grafts were used vs prosthetic (<50 years: 72.1% vs 50-79 years: 65.9%, $P = .024$; vs ≥ 80 years: 62.6%, $P = .002$). Fewer concomitant proximal procedures were performed compared with the older groups (<50 years: 37.7% vs 50-79 years: 51.1%, $P < .001$; vs ≥ 80 years: 39.5%, $P = .045$). More young patients returned to the operating room within their initial hospitalization for early graft thrombosis (<50 years: 5.6% vs 50-79 years: 2.9%, $P = .001$; vs ≥ 80 years: 2.4%, $P = .009$) and revision (<50 years: 4.7% vs 50-79 years: 2.2%, $P = .012$; vs ≥ 80 years: 1.4%, $P = .002$) compared with the older patients. Overall, MALE-free survival was similar across age groups ($P = .323$), as were patency and amputation rates. When considering only patients with CLI, MALE-free survival in the youngest patients was again similar ($P = .171$) but with significantly more major amputations at 1 year ($P = .022$).

Conclusions: For patients aged <50 undergoing infrainguinal bypass surgery, this large series demonstrates similar overall medium-term graft-related outcomes compared with older cohorts. Further, although the youngest patients with CLI have similar MALEs, their amputation rates are higher than in older cohorts.

Surgical outcomes of vascular reconstruction in soft tissue sarcomas of the lower extremities

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Background: Limb-sparing procedures are currently considered the standard treatment for lower limb soft tissue sarcoma (STS). Surgical excision combined with vascular resection may be necessary to provide an adequate safety margin and to improve the oncologic outcomes. In this scenario, vascular reconstruction is required to preserve limb function. We evaluated the long-term patency and survival outcomes of arterial and venous reconstruction after resecting lower limb STS in the largest single-center case series to date.

Methods: Between November 1995 and July 2014, 25 patients with lower limb STS and vascular invasion underwent surgical resection followed by arterial or venous reconstruction. Patients were followed up at regular outpatient visits, at which clinical examinations and duplex ultrasound mapping were performed to assess graft patency.

Results: A total of 44 revascularization procedures were performed. The median follow-up time for the arterial and venous groups combined was 25.2 months (range, 0.26-225.6 months). The 5-year survival probability was 42.1%. The graft occlusion rate was significantly higher after reconstruction with synthetic grafts than after

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