Abstracts of Current Literature

PERIPHERAL ARTERIAL INTERVENTIONS

Stent-grafts

Alsac JM, Zarins CK. The impact of aortic endografts on renal function. J Vasc Surg 2005; 41(6):926–930.

• OBJECTIVE: To determine the impact on late postoperative renal function of suprarenal and infrarenal fixation of endografts used to treat infrarenal abdominal aortic aneurysm (AAA). METHODS: Retrospective analysis of 277 patients treated from 2000 to 2003 with three different endografts at two clinical centers. Five patients on dialysis for preoperative chronic renal failure were excluded. Group IF of 135 patients treated with an infrarenal device (Medtronic AneuRx) was compared with group SF of 137 patients treated with a suprarenal device (106 Cook Zenith and 31 Medtronic Talent). Renal function was evaluated by calculating preoperative and latest postoperative creatinine clearance (CrCl) using the Cockcroft formula. Patients who developed a >20% decrease in CrCl were considered to have significantly impaired renal function. RESULTS: There were no significant differences in patient age, sex, aneurysm size, preoperative risk factors, dose of intra- and postoperative contrast, or baseline CrCl (IF: 69.3 mL/min, SF: 71.7 mL/min, $P = .4$). Follow-up time of 12.2 months was the same in both groups. CrCl decreased significantly during the follow-up period in both groups (IF: 69.3 mL/min to 61.7 mL/min, $P < .01$; SF: 71.7 mL/min to 64.9 mL/min, $P < .03$). Postoperative CrCl (IF: 61.7 mL/min, SF: 64.9 mL/min, $P = .3$), and the rate of CrCl decrease during the follow-up period (IF: −10.9%, SF: −9.5%, $P = .2$) was not different between the two groups. The number of patients with a > 20% decrease in CrCl was not different between the two groups (IF: $n = 35$ [25.9%], SF: $n = 41$ [29.9%], $P = .46$). However, the magnitude of decrease in CrCl in patients with renal impairment was greater in patients treated with suprarenal fixation endografts (SF: −39%) compared with those treated with infrarenal endografts (IF: −31%, $P = .005$). This greater degree of renal impairment was not due to identifiable differences in preoperative risk factors, age, or baseline CrCl. No patients in these series required dialysis. CONCLUSIONS: Regardless the type of endograft used, there is a 10% decrease in CrCl in the first year after endovascular aneurysm repair. Suprarenal fixation does not seem to increase the likelihood of postoperative renal impairment. Decline in renal function over time after endovascular aortic repair is probably due to multiple factors, and measures known to be effective in protecting kidneys should be considered for these patients. Long-term follow-up with measurement of CrCl, along with renal imaging and regular blood pressure measurements, should be performed to detect possible late renal dysfunction. Prospective studies comparing suprarenal versus infrarenal fixation are needed to confirm those results.
AUTHORS' ABSTRACT

Vascular Surgery

Lindenauer PK, Pekow P. Perioperative β-blocker therapy and mortality after major noncardiac surgery. N Engl J Med 2005; 353(4):349–361.

• BACKGROUND: Despite limited evidence from randomized trials, perioperative treatment with β-blockers is now widely advocated. We assessed the use of perioperative β-blockers and their association with in-hospital mortality in routine clinical practice. METHODS: We conducted a retrospective cohort study of patients 18 years of age or older who underwent major noncardiac surgery in 2000 and 2001 at 329 hospitals throughout the United States. We used propensity-score matching to adjust for differences between patients who received perioperative β-blockers and those who did not receive such therapy and compared in-hospital mortality using multivariable logistic modeling. RESULTS: Of 782,969 patients, 663,635 (85%) had no recorded contraindications to β-blockers, 122,338 of whom (18%) received such treatment during the first two hospital days, including 14% of patients with a Revised Cardiac Risk Index (RCRI) score of 0 and 44% with a score of 4 or higher. The relationship between perioperative β-blocker treatment and the risk of death varied directly with cardiac risk; among the 580,665 patients with an RCRI score of 0 or 1, treatment was associated with no benefit and possible harm, whereas among the patients with an RCRI score of 2, 3, or 4 or more, the adjusted odds ratios for death in the hospital were 0.88 (95% confidence interval, 0.80–0.98), 0.71 (95% confidence interval, 0.63–0.80), and 0.58 (95% confidence interval, 0.50–0.67), respectively. CONCLUSIONS: Perioperative β-blocker therapy is associated with a reduced risk of in-hospital death among high-risk, but not low-risk, patients undergoing major noncardiac surgery. Patient safety may be enhanced by increasing the use of β-blockers in high-risk patients.
AUTHORS' ABSTRACT

Stone PA, Armstrong PA. The value of duplex surveillance after open and endovascular popliteal aneurysm repair. J Vasc Surg 2005; 41(6):936–941.

• OBJECTIVE: The objective of this study was to determine the clinical value of vascular laboratory surveillance after open or endovascular repair of popliteal aneurysm by analysis of the frequency and nature of secondary interventions performed. METHODS: Over an 8-year period, 55 popliteal artery aneurysms were repaired in 46 men (mean age, 72 y) by aneurysm ligation and bypass grafting (vein, 37; prosthetic, 7), endoaneurysmorrhaphy and interposition grafting (prosthetic, 3; vein, 1), or endograft exclusion ($n = 7$). Indications for intervention included aneurysm thrombosis with critical limb ischemia ($n = 8$), symptomatic ($n = 10$) or asymptomatic ($n = 37$), >1.75 cm popliteal aneurysm with mural thrombus. Catheter-directed thrombolysis was used in three limbs to restore aneurysm and tibial artery patency before open repair. Duplex ultrasound surveillance was performed after repair to identify residual and acquired lesions. Life-table analysis was used to estimate repair site intervention-free (primary) and assisted-primary patency. RESULTS: During a mean 20-month follow-up interval, 20 secondary procedures were performed in 18 (31%) limbs to repair duplex-detected graft stenosis ($n = 10$), repair site thrombosis ($n = 5$), vein graft aneurysm ($n = 3$), graft entrapment ($n = 1$), or type 1 endoleak ($n = 1$). Primary patency was 76% and 68% at 1 and 3 years, and was uninfluenced by tibial artery runoff status or type of bypass conduit. Open ($n = 12$) or endovascular ($n = 8$) secondary procedures were performed on 15 (12 vein, 3 prosthetic) bypass grafts, 2 endografts, and 1 interposition graft. Mean time to repair graft stenosis (11 mo) was shorter than to repair of vein graft aneurysm (37 mo). Assisted-primary patency was 93% and

88% at 1 and 3 years; redo bypass grafting was required and successful in five limbs. Limb salvage was 100%. CONCLUSIONS: One third of popliteal artery aneurysms repaired by open or endovascular procedures required a secondary intervention within 2 years of repair. Repair-site surveillance using duplex ultrasound was able to identify lesions that threaten patency, which resulted in excellent assisted patency and limb preservation rates when corrected.
Authors' Abstract

CAROTID INTERVENTIONS

Sprouse LR, 2nd, Peeters P. The capture of visible debris by distal cerebral protection filters during carotid artery stenting: Is it predictable? J Vasc Surg 2005; 41(6):950–955.

• OBJECTIVES: Neurologic complications during carotid artery stenting (CAS) are most clearly associated with embolization of visible debris. Distal filter devices may provide cerebral protection by capturing clinically significant debris. However, they increase procedural time and expense and have their own set of complications. The current study was undertaken to identify the clinical factors predictive for the presence or absence of visible debris captured by distal filter devices during CAS. METHODS: Patients undergoing CAS with use of a distal filter device ($n = 279$) were prospectively entered into an investigational carotid registry. Recorded variables were classified as patient-, lesion-, or procedure-related. The filter was assessed for visible debris in each case. The odds ratio (OR) and 95% confidence interval (CI) were determined for each variable to predict visible debris. The ability of each variable to predict the absence of visible debris was assessed by calculating the individual negative predictive value (NPV). RESULTS: Visible debris was present in 169 filters (60.3%). There was an increased risk of visible debris found with several variables (OR, 95% CI): hypertension (2.9, 1.7–5.2), hypercholesterolemia (2.3, 1.4–3.9), stent diameter >9 mm (16.6, 9.0–30.0), and any neurologic event (4.2, 1.5–9.9). The NPV failed to exceed 0.80 (80%) for any variable. The NPV of the variables with a significantly elevated OR was as follows: hypertension (0.60), hypercholesterolemia (0.52), stent diameter >9 mm (0.75), and any neurologic event (0.38). CONCLUSIONS: Several clinical variables are associated with the presence of visible debris captured by distal filter devices. The current study failed to identify any variables capable of consistently predicting the absence of visible debris. These findings support the routine rather than the selective use of cerebral protection during CAS.
Authors' Abstract

Cayne NS, Faries PL. Carotid angioplasty and stent-induced bradycardia and hypotension: Impact of prophylactic atropine administration and prior carotid endarterectomy. J Vasc Surg 2005; 41(6):956–961.

• OBJECTIVE: We compared the physiologic effect of selective atropine administration for bradycardia with routine prophylactic administration, before balloon inflation, during carotid angioplasty and stenting (CAS). We also compared the incidence of procedural bradycardia and hypotension for CAS in patients with primary stenosis versus those with prior ipsilateral carotid endarterectomy (CEA). METHODS: A total of 86 patients were treated with CAS at 3 institutions. Complete periprocedural information was available for 75 of these patients. The median degree of stenosis was 90% (range, 60%–99%). Indications for CAS were severe comorbidities ($n = 49$), prior CEA ($n = 21$), and prior neck radiation ($n = 5$). Twenty patients with primary lesions were treated selectively with atropine only if symptomatic bradycardia occurred (nonprophylactic group). Thirty-four patients with primary lesions received routine prophylactic atropine administration before balloon inflation or stent deployment (prophylactic group). The 21 patients with prior CEA received selective atropine treatment only if symptomatic bradycardia occurred (prior CEA group) and were analyzed separately. Mean age and cardiac comorbidities did not vary significantly either between the prophylactic and nonprophylactic atropine groups or between the primary and prior CEA patient groups. Outcome measures included bradycardia (decrease in heart rate >50% or absolute heart rate <40 bpm), hypotension (systolic blood pressure <90 mm Hg or mean blood pressure <50 mm Hg), requirement for vasopressors, and cardiac morbidity (myocardial infarction or congestive heart failure). RESULTS: The overall incidence of hypotension and bradycardia in patients treated with CAS was 25 (33%) of 75. A decreased incidence of intraoperative bradycardia (9% vs. 50%; $P < .001$) and perioperative cardiac morbidity (0% vs. 15%; $P < .05$) was observed in patients with primary stenosis who received prophylactic atropine as compared with patients who did not receive prophylactic atropine. CAS after prior CEA was associated with a significantly lower incidence of perioperative bradycardia (10% vs. 33%; $P < .05$), hypotension (5% vs. 32%; $P < .05$), and vasopressor requirement (5% vs. 30%; $P < .05$), with a trend toward a lower incidence of cardiac morbidity (0% vs. 6%; not significant) as compared with patients treated with CAS for primary carotid lesions. There were no significant predictive demographic factors for bradycardia and hypotension after CAS. CONCLUSIONS: The administration of prophylactic atropine before balloon inflation during CAS decreases the incidence of intraoperative bradycardia and cardiac morbidity in primary CAS patients. Periprocedural bradycardia, hypotension, and the need for vasopressors occur more frequently with primary CAS than with redo CAS procedures. On the basis of our data, we recommend that prophylactic atropine administration be considered in patients with primary carotid lesions undergoing CAS.
Authors' Abstract

Jahromi AS, Cina CS. Sensitivity and specificity of color duplex ultrasound measurement in the estimation of internal carotid artery stenosis: a systematic review and meta-analysis. J Vasc Surg 2005; 41(6):962–972.

• BACKGROUND: Duplex ultrasound is widely used for the diagnosis of internal carotid artery stenosis. Standard duplex ultrasound criteria for the grading of internal carotid artery stenosis do not exist; thus, we conducted a systematic review and meta-analysis of the relation between the degree of internal carotid artery stenosis by duplex ultrasound criteria and degree of stenosis by angiography. METHODS: Data were gathered from Medline from January 1966 to January 2003, the Cochrane Central Register of Controlled Trials and Data base of Systematic Reviews, Data base of Abstracts of Reviews of Effects, ACP Journal Club, UpToDate, reference lists, and authors' files. Inclusion criteria were the comparison of color duplex ultrasound results with angiography by the North American Symptomatic Carotid Endarterectomy Trial method; peer-reviewed publications, and ≥ 10 adults. RESULTS: Variables extracted included internal carotid artery peak systolic velocity, internal carotid artery end diastolic velocity, internal carotid artery/common carotid artery peak systolic velocity ratio, sensitivity and specificity of duplex ultrasound scanning for internal carotid artery stenosis by angiography. The Standards for Reporting of Diagnostic Accuracy (STARD) criteria were used to assess study quality. Sensitivity and specificity for duplex ultrasound criteria were combined as weighted means by using a random effects model. The threshold of peak systolic velocity ≥ 130 cm/second is associated with sensitivity