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Meta-Analysis and Systematic Review of the Relationship between Hospital Volume and Outcome Following Carotid Endarterectomy

Holt P.J.E., Poloniecki J.D., Loftus I.M., Thompson M.M. Eur J Vasc Endovasc Surg 2007;33:645-51.

Objectives This study investigated the relationship between annual hospital volume and the outcomes in carotid endarterectomy and quantified critical volume threshold for this procedure.

Data sources PubMed, EMBASE and the Cochrane library were searched for all articles on the volume-outcome relationship in CEA.

Review methods Articles were included if they presented data on post-operative mortality and/or stroke rates and annual hospital volume of CEA. The review conformed to the QUOROM statement. The data were meta-analysed and a pooled effect estimate of volume on the stroke and/or mortality rates from CEA quantified, along with the critical volume threshold.

Results Twenty-five articles, encompassing 936 436 CEA, were analysed. Significant relationships between mortality rate and stroke rate and annual volume were seen.

Overall, the pooled effect estimate was odds ratio 0.78 [95% confidence interval 0.64–0.92], in favour of surgery at higher volume units, with a critical volume threshold of 79 CEA per annum.

Conclusions Significantly lower mortality and stroke rates were achieved at hospitals providing a higher annual hospital volume of CEA. Hospitals wishing to provide CEA should adhere to minimum volume criteria.

The Fate of the External Carotid Artery after Carotid Artery Stenting. A Follow-up Study with Duplex Ultrasonography

de Borst G.J., Vos J.A., Reichmann B., Hellings W.E., de Vries J.P.P.M., Suttorp M.J., Moll F.L., Ackerstaff R.G.A., On behalf of the Antonius Carotid Endarterectomy, Angioplasty, and Stenting Study Group [a]The members are listed in the appendix. Eur J Vasc Endovasc Surg 2007;33:657-63.

Objective To evaluate the long-term effect of carotid angioplasty and stenting (CAS) of the internal carotid artery (ICA) on the ipsilateral external carotid artery (ECA).

Subjects and Methods We prospectively registered the pre- and post-interventional duplex scans obtained from 312 patients (mean age 70 years) who underwent CAS. Duplex scans were scheduled the day before CAS, 3 and 12 months post-procedurally and yearly thereafter, to study progression of obstructive disease in the ipsilateral ECA compared to the contralateral ECA. The duplex ultrasound criteria used to identify ECA stenosis ≥50% were Peak Systolic Velocities of ≥125 cm/s.

Results Preprocedural evaluation of the ipsilateral ECA demonstrated ≥50% stenosis in 32.7% of cases vs 30% contralateral. Both ipsilateral and contralateral 3 (1%) ECA occlusions were noted. After stenting 5 (1.8%) occlusions were seen vs 1% contralateral. No additional ipsilateral occlusions and 2 additional contralateral oclusions were noted at extended follow-up. The prevalence of ≥50% stenosis of the ipsilateral ECA (Kaplan-Meier estimates) progressed from 49.1% at 3, to 56.4%, 64.7%, 78.2%, 72.3%, and 74% at 12, 24, 36, 48, and 60 months respectively. Contralateral prevalences were 31.3%, 37.7%, 41.7%, 43.1%, 46.0%, and 47.2% respectively ($p<0.001$). Progression of stenosis was more pronounced in 234 patients (75%) with overstenting of the carotid bifurcation ($p=0.004$).

Conclusion Our results show that significant progression of ≥50% stenosis in the ipsilateral ECA occurs after CAS. There was greater progression of disease in the ipsilateral compared with the contralateral ECA. Progression of disease in the ECA did not lead to the occurrence of occlusion during follow up.

The Amsterdam Acute Aneurysm Trial: Suitability and Application Rate for Endovascular Repair of Ruptured Abdominal Aortic Aneurysms

Hoornweg L.L., Wisselink W., Vahl A., Balm R. On behalf of the Amsterdam Acute Aneurysm Trial Collaborators Eur J Vasc Endovasc Surg 2007; 33:679-83.

Purpose To evaluate anatomical suitability and application rate for endovascular repair of patients with a ruptured abdominal aortic aneurysm (RAAA).

Methods The Amsterdam Acute Aneurysm trial is a multicenter randomised trial comparing open with endovascular treatment in patients with a RAAA (International Standard Randomized Controlled Trial Number (ISRCTN) 66212637). Between April 2004 and January 2006, all consecutive patients with clinical suspicion of a RAAA at presentation were assessed prospectively. Anatomical suitability for endovascular repair was based on use of an aorto-uni-iliac endovascular graft and assessed in patients with a proven aortic rupture on CT angiography (CTA).

Results In 128/256 patients, presenting with clinical suspicion of a ruptured aneurysm, RAAA was diagnosed. 105 patients were brought to a trial center and CTA confirmed RAAA in 83 patients. In 38 of 83 patients (45.8%) with positive CTA, the anatomy of the aorta and iliac arteries was considered suitable for endovascular repair. Exclusion from endovascular repair was due to unsuitable infrarenal neck or iliac anatomy (37 and 8 patients respectively). Overall, endovascular treatment was applicable in 38/128 patients (29.7%) with a RAAA in the Amsterdam region and in 38 out of 105 patients (35.5%) admitted to the trial centers.

Conclusion In this prospective cohort of all patients with a RAAA in the Amsterdam Acute Aneurysm Trial region, the suitability for endovascular repair in patients with a RAAA confirmed on CTA is 45.8%, but the application rate was lower.

Popliteal Artery Aneurysm with Acute Ischemia in 229 Patients. Outcome after Thrombolytic and Surgical Therapy

Ravn H., Björck M. Eur J Vasc Endovasc Surg 2007;33:690-95.

Objectives The aim of this study was to assess the national management and outcome of popliteal artery aneurysm (PAA).

Methods In the Swedish National Registry 717 primary operations for PAA on 571 patients were registered prospectively between 1987 and 2002. 235 patients presented with acute ischemia.

Results Median age was 70 for men and 75 for women. Immediate surgery was performed in 135 legs, including intraoperative thrombolysis in 32 cases (Immediate Surgery Group, ISG). Pre-operative thrombolysis was performed in 100 legs, followed by acute (≤24 hours, 41 legs) or elective (59 legs) surgery (Delayed Surgery Group, DSG). DSG had smaller PAA (27 versus 37 mm, $p<0.0001$) and were younger (67 versus 72 years, $p<0.001$). Run-off was worse in DSG than in ISG ($p<0.001$) and improved in 87% after thrombolysis. Amputation-rate was 27% in the ISG and 7% in the DSG, $P<0.0001$. The ISG required fasciotomy in 30% compared to 11% of the DSG, $p=0.0001$.

Conclusion Patients in the ISG and DSG differed in their pre-operative characteristics and were selected to the treatment modalities in a complex manner. Preoperative thrombolysis improves run-off.

Preoperative Nutritional Status Predicts the Severity of the Systemic Inflammatory Response Syndrome (SIRS) Following Major Vascular Surgery

Hassen T.A., Pearson S., Cowled P.A., Fitridge R.A. Eur J Vasc Endovasc Surg 2007;33:696-702.

Objectives This study examined the relationship between preoperative nutritional status and systemic inflammatory response syndrome (SIRS) or sepsis following major vascular surgery.

Design and methods Subjects undergoing open AAA repair, EVAR or lower limb revascularisation were studied prospectively. Pre-operative nutrition was assessed clinically using Mini-Nutritional Assessment (MNA) and body composition was measured by dual energy X-ray absorptiometry (DEXA) scanning. SIRS severity was assessed for 5 post-operative days and sepsis noted within 30 days of surgery.

Results Using MNA, neither SIRS severity nor sepsis occurrence differed significantly between 'well-nourished' subjects and those 'at risk of malnutrition.' Using DEXA, negative associations existed between body mass index and both SIRS score and SIRS duration. Fat free mass (FFM) was negatively associated with SIRS score and duration. Negative associations also existed between skeletal muscle mass (SMM) and SIRS score and duration. SMM was also negatively correlated with post-operative length of stay in hospital. There were no significant correlations between sepsis and any nutritional indices.

Conclusions Lower pre-operative nutritional indices, indicating protein energy malnutrition, were associated with more severe systemic inflammatory responses following major vascular surgery.