

# Selected Abstracts from the April Issue of the European Journal of Vascular and Endovascular Surgery

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## Hyperhomocysteinaemia is Associated with the Rate of Abdominal Aortic Aneurysm Expansion

Halazun K.J., Bofkin K.A., Asthana S., Evans C., Henderson M., Spark J.I. *Eur J Vasc Endovasc Surg* 2007;33:391-4.

**Objectives** Previous literature has suggested an association between AAA and the presence of elevated plasma homocysteine levels (HCY). Homocysteine can stimulate elastolysis in the arterial media via activation of elastase and matrix metalloproteinases. No evidence in the literature exists correlating aneurysm expansion and HCY. The study objective is to identify whether the rate of AAA expansion is related to HCY.

**Methods** 108 patients undergoing surveillance for AAA were identified at our vascular surgical unit. AAA size and growth rate were assessed by serial ultrasonographic measurements. Fasting total HCY levels were measured using fluorescence polarisation immunoassays. Demographic details and atherosclerotic risk factors were noted all AAA patients. A multivariate analysis was performed for growth rate vs. HCY, hypertension and hypercholesterolaemia. The correlation between AAA growth rate, AAA size and HCY levels were calculated.

**Results** 60% of patients with AAA had some degree of hyperhomocysteinaemia ( $>15 \mu\text{mol/l}$ ). Multivariate analysis showed HCY to be the only significant factor affecting AAA growth rate. A positive correlation was demonstrated between HCY levels and AAA growth rate using a linear regression model ( $R=0.28$ ,  $p=0.003$ ). Median growth rate among patients with hyper-HCY was double that of patients with normal HCY (0.5 mm/month vs. 0.25 mm/month,  $p=0.003$ ). A growth rate of  $>10$  mm/year was seen in 25% of hyper HCY patients and in only 2% of patients with normal HCY. In addition patients with hyper HCY and larger AAAs ( $>4$  cm) had a growth rate twice as fast as patients with hyper HCY and AAAs  $<4$  cm.

**Conclusions** A correlation between HCY and growth rate exists, although this is weak due to the multifactorial aetiology of AAAs. Hyper-HCY patients have faster expansion rates than patients with normal HCY, with significant numbers demonstrating rapid expansion ( $>10$  mm/year) and therefore an increased risk of rupture.

## Intravascular Stapler for "Open" Aortic Surgery: Preliminary Results

Shifrin E.G., Moore W.S., Bell P.R.F., Kolvenbach R., Daniline E.I. *Eur J Vasc Endovasc Surg* 2007;33:408-11.

**Objectives** The aim of this study was to assess the efficacy of a new stapling device using a pig model.

**Methods** Straight 12 mm Gore-Tex grafts were inserted end to end into the aorta of 12 pigs. One anastomosis was performed with the stapler and the other using 4/0 prolene sutures and 13 mm needles. The animals were sacrificed at one week, one and three months and all grafts underwent histological examination. Leakage from the anastomoses was assessed in a separate specially designed circulation model using saline as a perfusate.

**Results** The stapled anastomoses took  $1.0 \pm 0.25$  minutes to complete while suturing took  $8.5 \pm 1.5$  minutes. There was no difference in the histology between the two types of anastomosis. The leak rate was six times greater at the sutured compared to the stapled anastomosis.

**Conclusion** The use of stapled anastomoses may allow a significant shortening of aortic cross clamping time, reduce anastomotic leakage and may be particularly useful in laparoscopic aortic repair. A randomised trial is required to assess the efficacy of this device.

## An Implantable Carotid Sinus Baroreflex Activating System: Surgical Technique and Short-Term Outcome from a Multi-Center Feasibility Trial for the Treatment of Resistant Hypertension

Tordoir J.H.M., Scheffers I., Schmidli J., Savolainen H., Liebeskind U., Hansky B., Herold U., Irwin E., Kroon A.A., de Leeuw P., Peters T.K., Kieval R., Cody R. *Eur J Vasc Endovasc Surg* 2007;33:414-21.

**Objectives** To assess perioperative outcomes and blood pressure (BP) responses to an implantable carotid sinus baroreflex activating system being investigated for the treatment of resistant hypertension.

**Methods** We report on the first seventeen patients enrolled in a multicenter study. Bilateral perivascular carotid sinus electrodes (CSL) and a pulse generator (IPG) are permanently implanted. Optimal placement of the CSL is determined by intraoperative BP responses to test activations. Acute BP responses were tested postoperatively and during the first four months of follow-up.

**Results** Prior to implant, BP was  $189.6 \pm 27.5/110.7 \pm 15.3$  mmHg despite stable therapy ( $5.2 \pm 1.8$  antihypertensive drugs). The mean procedure time was  $202 \pm 43$  minutes. No perioperative strokes or deaths occurred. System tests performed 1 or up to 3 days postoperatively resulted in significant (all  $p \leq 0.0001$ ) mean maximum reduction, with standard deviations and 95% confidence limits for systolic BP, diastolic BP and heart rate of  $28 \pm 22$  (17, 39) mmHg,  $16 \pm 11$  (10, 22) mmHg and  $8 \pm 4$  (6, 11) BPM, respectively. Repeated testing during 3 months of therapeutic electrical activation demonstrated a durable response.

**Conclusions** These preliminary data suggest an acceptable safety of the procedure with a low rate of adverse events and support further clinical development of baroreflex activation as a new concept to treat resistant hypertension.

## Aortic Arch Anomalies are Associated with Increased Risk of Neurological Events in Carotid Stent Procedures

Faggioli G.L., Ferri M., Freyre A., Gargiulo M., Fratesi F., Rossi C., Manzoli L., Stella A. *Eur J Vasc Endovasc Surg* 2007;33:436-41.

**Objective** To establish the risk of carotid artery stent (CAS) complications in patients with aortic arch anomalies.

**Methods** In a prospective series of patients submitted to CAS, all cases with arch anomalies were compared with cases with normal arch anatomy (type I, II and III) in order to assess the impact of anatomic characteristics on technical and clinical outcome. Outcome was evaluated in term of neurological complications and technical success.

**Results** Of 214 consecutive patients undergoing CAS, 189 (88.3%) had normal arch anatomy and 25 (11.7%) arch anomalies. The arch abnormalities included common origin of brachiocephalic trunk and left common carotid artery in 22 cases (10.2%), separate origin of right subclavian and common carotid in 2 cases (0.9%) and left common carotid agenesis with separate arch origin of internal and external carotid in 1 case (0.5%). The two groups were not different in term of epidemiology and preoperative clinical and morphological characteristics. Technical failure occurred overall in 26 cases (12%) and neurological complication in 14 cases (6.5%). All symptoms were temporary. Technical failure was higher in the arch anomaly group; however the difference did not reach statistical significance (89.6% vs 76.4%,  $P=0.1$ ). Neurological complications occurred more frequently in the arch anomaly group (20% vs 5.3%,  $P=0.039$ ). Type of arch was the only variable independently associated with neurological complications (OR=2.01,  $p=0.026$ ).

**Conclusion** Aortic arch anomalies are not infrequent and are associated with increased risk of neurological complications. The indication for CAS should be carefully evaluated in these cases.

## Characteristics and Treatments of Patients with Peripheral Arterial Disease Referred to UK Vascular Clinics: Results of a Prospective Registry

Khan S., Flather M., Mister R., Delahunty N., Fowkes G., Bradbury A., Stansby G. *Eur J Vasc Endovasc Surg* 2007;33:442-50.

**Background** Peripheral arterial disease (PAD) is often associated with risk factors including cigarette smoking, hypertension and hypercholesterolaemia, and patients have a high risk of future vascular events. Good medical management results in improved outcomes and quality of life, but previous studies have documented sub-optimal treatment of risk factors. We assessed the management of cardiovascular risk factors in patients with PAD referred to specialist vascular clinics.

**Methods** This was a prospective, protocol driven registry carried out in UK vascular clinics. Patients who were first-time referrals for evaluation of PAD were eligible if they had claudication plus ankle-brachial pressure index (ABPI)  $\leq 0.9$ . Statistical associations between key demographic and treatment variables were explored using a chi-squared test.

**Results** We enrolled 473 patients from 23 sites. Mean age was 68 years (SD 10) and 66% were male. Mean estimated claudication distance was 100 m, and ABPI was 0.74. Mean systolic blood pressure (SBP) was 155 mmHg, and 42% had a SBP  $>160$  mmHg. Forty percent were current smokers and half had tried to give up in the prior 6 months, but there was no evidence of a systematic method of smoking cessation. Mean total cholesterol was 5.4 (SD 1.2) mmol/l and 30% had levels  $>6$  mmol/l. Antiplatelet therapy had been given to 70% and statins to 44%. Prior CHD was present in 29% and these patients had significantly higher use of antiplatelet therapy, statins and ACE-inhibitors.