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

A. Ross Naylor, MBChB, MD, FRCS, Editor-in-Chief, and Philippe H. Kolh, MD, PhD, Senior Editor

Carotid Artery Atherosclerosis Among 65-year-old Swedish Men — A Population-Based Screening Study


Objective: There are limited contemporary epidemiological data on the prevalence of carotid atherosclerosis in the general population. The aim was to determine the prevalence of and risk factors associated with carotid artery atherosclerosis among 65-year-old men.

Methods: This was a population-based screening study. All 65-year-old men in the County of Uppsala, Sweden, who attended screening for abdominal aortic aneurysm (AAA) 2007–2009, were invited for duplex scanning of the carotid arteries.

Results: Of 4801 men invited, 4657 (97%) accepted. Carotid plaques (>2 x 6 mm) were observed in 1169 (25%) men, 94 (2.0%) had carotid stenoses (50–99%), and 15 (0.3%) had occluded carotid arteries. In a multivariate logistic regression model, smoking (OR 1.7, 95% CI 1.5–1.9), hypercholesterolemia (1.5, 95% CI 1.3–1.7), diabetes mellitus (1.2, 95% CI 1.0–1.5), and coronary artery disease (1.5, 95% CI 1.3–1.8) were associated with prevalence of carotid atherosclerosis (plaque and/or stenosis). The use of antiplatelet agents and statins in participants with a carotid plaque was 20% and 29%, respectively. The corresponding figures in participants with a stenosis were 42% and 41%.

Conclusions: This study offers contemporary data on the prevalence of carotid atherosclerosis in a population-based cohort of 65-year-old men. Most of those at risk had no other clinical manifestation of atherosclerosis, and therefore had no secondary prevention.

Treatement Decisions for Descending Thoracic Aneurysm: Preferences for Thoracic Endovascular Aneurysm Repair or Surveillance in a Discrete Choice Experiment


Objective: To investigate and rank factors that influence endovascular treatment decisions by specialists for patients with descending thoracic aortic aneurysm (dTAA).

Methods: Specialists completed a diagrammatic survey describing uncertainty about the benefit of thoracic endovascular aneurysm repair (TEVAR) for dTAA with respect to age, sex, and aneurysm diameter. Subsequently, a detailed discrete choice experiment was designed. Specialists were recruited and asked to indicate treatment preference (TEVAR or surveillance) in 25 hypothetical cases of dTAA, with variable patient attributes: age, sex, American Society of Anesthesiologists (ASA) grade, aneurysm diameter, adequate landing zone distal to left subclavian artery (LSA), and length of aortic coverage. Data were analysed using multiple logistic regression.

Results: The diagrammatic survey, based on 50 respondents, showed that uncertainty about the benefits of TEVAR was greatest for patients aged 80–85 years (up to 47% of respondents were “unsure”) and that uncertainty increased with increasing aneurysm diameter (for an 80-year-old man, 7% were unsure at 5.5 cm and 33% were unsure at 7.0 cm). Seventy-one specialists (mainly from Europe and North America, 86% vascular surgeons and 98% working in units offering TEVAR) completed the discrete choice experiment. Preference for TEVAR increased greatly with enlarging interval [CI] 9.83–25.40); >6.0–6.5 cm = 39.0 (95% CI 202.00–766.00); >6.5–7.0 cm = 1829.0 (95% CI 400.00–4,181.00). TEVAR was less likely to be preferred in patients older than 75 years (>75–80 years OR 0.32, 95% CI 0.21–0.49; >80–85 years OR 0.18, 95% CI 0.11–0.28); in women (OR 0.52, 95% CI 0.37–0.74); in patients classified as ASA grade 4 (OR 0.44, 95% CI 0.36–0.57); and in patients with aortic coverage >25 cm (OR 0.48, 95% CI 0.32–0.74). The proximal landing zone did not influence preference.

Conclusion: Specialists’ preferences for endovascular repair of degenerative dTAA vary widely, and demonstrate clinical uncertainty, especially in octogenarians, and a reluctance to offer TEVAR to women. Aneurysm diameter dominates treatment preferences, but patient fitness and length of aortic coverage (>25 cm) also were influential, although the landing zone distal to LSA was not.

Spontaneous Delayed Sealing in Selected Patients with a Primary Type-Ia Endoleak After Endovascular Aneurysm Repair


Objective: Direct additional therapy is advised for type Ia endoleaks detected on completion angiography after endovascular aneurysm repair (EVAR). Additional intraoperative endovascular procedures are, however, often challenging or not possible, and direct open conversion is unattractive.

The results of a selective, conservative strategy for patients with primary type-Ia endoleak has been analysed.

Methods: This was a retrospective, single-centre study (UMC, Utrecht, NL). From 2004 to 2008, all patients with a primary type-Ia endoleak and suitable anatomy for EVAR, stentgraft oversizing ≥15%, and optimal deployment were included. Complications during follow-up were studied and all sequential CTA scans were reviewed. These were compared with the remaining patients, treated during the same period.

Results: Fifteen patients were included (14 male, median age 77, range 67–85) with a median aneurysm diameter of 60 mm (48–80); an aneurysm neck diameter of 26 mm (21–32), a neck length of 29 mm (11–39), and infrarenal angulation of 49° (31–90). One patient suffered rupture 2 days after EVAR — leading to the only AAA-related death. Eight of the 15 type-Ia endoleaks disappeared spontaneously on the first postoperative CTA, obtained within 1 week of EVAR. On the second postoperative CTA, obtained a median of 5 months (1–12) after EVAR, all remaining endoleaks had sealed. One recurrence occurred at 4.85 years. During a median follow-up of 3.3 years, there were five secondary interventions. Compared with controls, there were more secondary (or recurrent) type-Ia endoleaks (13% vs. 4%), endograft migrations (13% vs. 3%), sac growths (33% vs. 16%), and secondary interventions (33% vs. 23%). None of these differences however, were statistically significant.

Conclusions: All but one of the primary type-Ia endoleaks sealed spontaneously. Until sealing, the risk of rupture persisted, but subsequently only one recurrence of type IIb endoleak was seen. In selected patients, a conservative approach for primary type-Ia endoleaks may be justified.

Healthcare Quality Indicators of Peripheral Artery Disease Based on Systematic Reviews


Objectives: Peripheral artery disease (PAD) is a major health problem whose clinical management includes multiple options regarding risk factor control, diagnosis, and medical and surgical treatment. The aim was to generate indicators based on systematic reviews to evaluate the quality of healthcare provided in PAD.

Methods: Electronic searches were run for systematic reviews in The Cochrane Library (Issue 6, 2011), MEDLINE, EMBASE, and other databases (up to June 2011). Conclusive systematic reviews of high methodological quality were selected to formulate clinical recommendations. Indicators were derived from clinical recommendations with moderate to very high strength of recommendation. High-quality systematic reviews were selected and nine clinical recommendations were formulated with a moderate to very high strength of recommendation. Six indicators were finally generated: four on pharmacological interventions, antiplatelet agents, naftidrofuryl, cilostazol, and statins; and two lifestyle interventions, exercise and tobacco cessation. No indicators were derived for diagnostic tests or surgical techniques. Most indicators targeted patients with intermittent claudication.
Conclusions: These quality indicators will help clinicians to assess the appropriateness of healthcare provided in PAD. The development of evidence-based indicators in PAD is limited by the lack of methodological quality of the research in this disease, the inconclusiveness of the evidence on diagnostic and surgical techniques, and the dynamic nature of the vascular diseases field.

Systematic Review and Meta-analysis of Direct Versus Indirect Angiosomal Revascularisation of Infrapopliteal Arteries

Objective: The aim of this systematic review was to evaluate outcomes of direct revascularisation (DR) versus indirect revascularisation (IR) of infrapopliteal arteries to the affected angiosome for critical limb ischaemia. Both open and endovascular techniques were included.

Methods: A systematic review of key electronic journal databases was undertaken from inception to 22 March 2014. Studies comparing DR versus IR in patients with localised tissue loss were included. Meta-analysis was performed for wound healing, limb salvage, mortality, and re-intervention rates, with numerous sensitivity analyses. Quality of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system.

Results: Fifteen cohort studies reporting on 1,868 individual limbs were included (endovascular revascularisation, 1,284 limbs; surgical revascularisation, 508 limbs; both methods, 76 limbs). GRADE quality of evidence was low or very low for all outcomes. DR resulted in improved wound healing rates compared with IR (odds ratio [OR] 0.40, 95% confidence interval [CI] 0.29–0.54) and improved limb salvage rates (OR 0.24, 95% CI 0.13–0.45), although this latter effect was lost on high-quality study sensitivity analysis. Wound healing and limb salvage was improved for both open and endovascular intervention. There was no effect on mortality (OR 0.77, 95% CI 0.50–1.19) or reintervention rates (OR: 0.44, 95% CI 0.10–1.88).

Conclusion: DR of the tibial vessels appears to result in improved wound healing and limb salvage rates compared with IR, with no effect on mortality or reintervention rates. However, the quality of evidence on which these conclusions are based is low.

Role of Sinus in Prosthetic Venous Valve

Background: The majority of bioprosthetic venous valves do not have a sinus pocket and, in practice, they are often placed in non-sinus segments of the veins. The aim of this study is to investigate the effect of the sinus pocket on the flow dynamics in a prosthetic valve.

Methods: A bench top in vitro experiment was set up at physiological flow conditions to simulate the flow inside a venous system. Bicuspid bioprosthetic valves with different leaflet lengths (5 and 10 mm) were tested in tubes with and without a sinus pocket and the flows around the valve were visualized by particle image velocimetry (PIV). Velocity data measurements were made and the vorticity was calculated in the with- and without-sinus set-ups.

Results: PIV measurements showed that vortex structure was maintained by the sinus. For the 10-mm leaflet length design with sinus, the jet width at the exit of the valve was 59% of that without sinus. For the 5-mm design with sinus, the jet width was 73% of the valve without sinus. Flow from the sinus region was entrained into the main jet observed near the exit of the sinus and altered the flow at the near wall region.

Conclusions: The sinus pocket alters the flow around the valve and functions as flow regulator to smooth the flow pattern around the valve. The vortical structure inside the sinus is maintained at the valve leaflet tip during the valve cycle. For the prosthetic valve designated to be placed without a sinus, a shorter leaflet length is preferable and performs more closely to the valve with sinus.