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Optimal Management of Traumatic Aortic Injury

Fattori R., Russo V., Lovato L., Di Bartolomeo R. Eur J Vasc Endovasc Surg 2009;37:8-14.

Background: The best time to intervene in traumatic aortic injuries has long been a matter of debate. While emergency surgery is characterized by high morbidity and mortality, initial medical management of uncomplicated aortic injury and subsequent delayed surgery resulted in better outcome.

Methods and results: From analysis of medical literature of the last 10 years, major paradigm shift in management of traumatic injuries includes the use of different imaging methods for diagnosis , with a almost complete elimination of aortography and transesophageal echocardiography in favour of CT scan, and a significant change in method of definitive repair, shifting from exclusively open techniques in 1997 to predominantly endovascular repairs in 2007. At present several reports in literature provide data on comparative results of endovascular therapy with respect open surgery, supporting the use of stent-graft in traumatic injuries, both in acute and chronic cases. The authors' personal experience comprises 58 patients treated with endovascular stent-graft repair, with no mortality or treatment failure even during 11 years follow-up

Conclusions: For many years traumatic aortic injury has been considered a highly lethal lesion and a potential cause of death in blunt chest trauma. Because of the lower invasivity endovascular repair can be applied in traumatic aortic injury with very low risk and limited impact on trauma destabilization. Long term follow-up seems indicate a substantial durability of the procedure.

Aneurysm Rupture after EVAR: Can the Ultimate Failure be Predicted?

Schlösser F.J.V., Gusberg R.J., Dardik A., Lin P.H., Verhagen H.J.M., Moll F.L., Muhs B.E. Eur J Vasc Endovasc Surg 2009;37:15-22.

Objectives: To provide insight into the causes and timing of AAA rupture after EVAR.

Design: Original data regarding AAA ruptures following EVAR were collected from MEDLINE and EMBASE databases. Data were extracted systematically and patient and procedural characteristics were analyzed.

Results: 270 patients with AAA ruptures after EVAR were identified. Causes of rupture included endoleaks (in 160: type IA 57, type IB 31, type II 23, type III 26, type IV 0, endotension 9, unspecified 14), graft migration 41, graft disconnection 11 and infection 6. Most of the described AAA ruptures occurred within 2–3 years after EVAR. Mean initial AAA diameter was relatively large (65 mm). No abnormalities were present in 41 patients during follow-up before rupture. Structural graft failure was described in 96 and a fatal course in 119 patients.

Conclusions: Focus of surveillance on the first 2–3 years after EVAR may possibly reduce the AAA rupture rate, especially in patients with increased risk of early rupture (relatively large initial AAA diameter or presence of endoleak or graft migration). Better stent-graft durability and longevity is required to further reduce the AAA rupture risk after EVAR. Complete prevention will however remain challenging since AAA rupture may occur even if no predisposing abnormalities are present.

Characterisation of Interleukin-8 and Monocyte Chemoattractant Protein-1 Expression within the Abdominal Aortic Aneurysm and their Association with Mural Inflammation

Middleton R.K., Bown M.J., Lloyd G.M., Jones J.L., London N.J., Sayers R.D. Eur J Vasc Endovasc Surg 2009;37:46-55.

Objectives: Abdominal aortic aneurysms (AAAs) are characterised by chronic transmural inflammation. This study investigated the expression of interleukin-8 (IL-8) and monocyte chemoattractant protein-1 (MCP-1) within the AAA, and their relationship with mural inflammation.

Methods: Biopsies were obtained from 25 AAAs, 15 abdominal aortas, and 10 atherosclerotic thoracic aortas. IL-8 and MCP-1 expression was measured in homogenised specimens by ELISA. Infiltrate composition and localised expression of IL-8 and MCP-1 were determined through immunohistochemistry.

Results: ELISA analysis demonstrated that IL-8 and MCP-1 were raised in the AAA compared to the controls [(IL-8, AAA vs. abdominal aorta: >28-fold, $P < .001$; AAA vs. thoracic aorta: >28-fold, $P < .001$) (MCP-1, AAA vs. abdominal aorta: 9-fold, $P < .001$; AAA vs. thoracic aorta: 19-fold, $P < .001$)]. Immunohistochemistry revealed that IL-8 was localised to the inflammatory infiltrate, which consisted predominantly of $CD3^+$ T- and $CD20^+$ B-lymphocytes. MCP-1 was predominantly expressed by $CD68^+$ macrophages. Increasing IL-8 expression was associated with an increase in mural inflammation, and an increase in $CD3^+$ T-lymphocytes of $CD4^+$ phenotype within the infiltrate population.

Conclusion: Pathways involving IL-8 and MCP-1 may be involved in AAA pathogenesis. IL-8 may be directly involved in the chemotaxis of T_H-lymphocytes into the AAA wall.

The Development of a VBHOM-based Outcome Model for Lower Limb Amputation Performed for Critical Ischaemia

Tang T.Y., Prytherch D.R., Walsh S.R., Athanassoglou V., Seppi V., Sadat U., Lees T.A., Varty K., Boyle J.R. In Association with the Audit and Research Committee of the Vascular Society of Great Britain & Ireland (VSGBI). Eur J Vasc Endovasc Surg 2009;37:62-6.

Background: VBHOM (Vascular Biochemistry and Haematology Outcome Models) adopts the approach of using a minimum data set to model outcome and has been previously shown to be feasible after index arterial operations. This study attempts to model mortality following lower limb amputation for critical limb ischaemia using the VBHOM concept.

Methods: A binary logistic regression model of risk of mortality was built using National Vascular Database items that contained the complete data required by the model from 269 admissions for lower limb amputation. The subset of NVD data items used were urea, creatinine, sodium, potassium, haemoglobin, white cell count, age on and mode of admission. This model was applied prospectively to a test set of data ($n = 269$), which were not part of the original training set to develop the predictor equation.

Results: Outcome following lower limb amputation could be described accurately using the same model. The overall mean predicted risk of mortality was 32%, predicting 86 deaths. Actual number of deaths was 86 ($\chi^2 = 8.05$, 8 d.f., $p = 0.429$; no evidence of lack of fit). The model demonstrated adequate discrimination (c-index = 0.704).

Conclusions: VBHOM provides a single unified model that allows good prediction of surgical mortality in this high risk group of individuals. It uses a small, simple and objective clinical data set that may also simplify comparative audit within vascular surgery.

Short-Term Results of A Randomized Trial Comparing Remote Endarterectomy and Supragenicular Bypass Surgery for Long Occlusions of the Superficial Femoral Artery [The REVAS Trial]

Gisbertz Suzanne S., Ramzan Michael, Tutein Nolthenius Rudolph P., van der Laan Lyckle, Overtoom Tim Th. C., Moll Frans L., de Vries Jean-Paul P.M. Eur J Vasc Endovasc Surg 2009;37:68-76.

Objective: Techniques for surgical repair of Trans-Atlantic Inter-Society Consensus (TASC) C and D lesions of the superficial femoral artery (SFA) are supragenicular bypass grafting or the less invasive remote endarterectomy (RSFAE). This trial compares the patency rates of both techniques.

Design: Randomized, multicenter trial.

Materials and methods: 116 patients were randomized to RSFAE ($n = 61$) and supragenicular bypass surgery ($n = 55$). Indications for surgery were claudication ($n = 77$), rest pain ($n = 21$), or tissue loss ($n = 18$).

Results: Median hospital stay was 4 days in the RSFAE group compared with 6 days in the bypass group ($p = 0.004$). Primary patency after 1-year follow-up was 61% for RSFAE and 73% for bypass ($p = 0.094$). Secondary patency was 79% for both groups. Subdividing between venous ($n = 25$) and prosthetic grafts ($n = 30$) shows a primary patency of 89% and 63% respectively at 1-year follow-up ($p = 0.086$).

Conclusion: RSFAE is a minimally invasive adjunct in the treatment of TASC C and D lesions of the SFA, with shorter admittance and a comparable secondary patency rate to bypass. The venous bypass is superior to both RSFAE and PTFE bypass surgery, but only 45% of patients had a sufficient saphenous vein available.

This study is registered with ClinicalTrials.gov, number NCT00566436.