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Mid-term Outcomes and Aortic Remodelling After Thoracic Endovascular Repair for Acute, Subacute, and Chronic Aortic Dissection: The VIRTUE Registry

The VIRTUE Registry Investigators. Eur J Vasc Endovasc Surg 2014;48:361-9.

Objective: The VIRTUE Registry describes the mid-term clinical and morphological results of thoracic endovascular repair (TEVR) in patients with type B aortic dissection.

Methods: This was a prospective cohort study. The VIRTUE Registry is a prospective, multicentre clinical trial that enrolled patients with complicated acute (<15 days), subacute (15–92 days), and chronic (>92 days) type B aortic dissections treated with the Valiant endograft. One hundred patients were enrolled and the clinical outcomes described at the 3-year follow-up. Analysis of the aortic area and false lumen thrombosis rates defined the morphological response to TEVR in the three clinical groups.

Results: Three-year all-cause mortality (18%, 4%, and 24%), dissection related mortality (12%, 4%, and 9%), aortic rupture (2%, 0%, and 4%), retrograde type A dissection (5%, 0%, and 0%), and aortic reintervention rates (20%, 22%, and 39%) were, respectively, defined for patients with acute (n = 50), subacute (n = 24), and chronic (n = 26) dissections. Analysis of aortic morphology observed that patients with subacute dissection demonstrated a similar degree of aortic remodelling to patients with acute dissection. Patients with acute and subacute dissection exhibited greater aortic plasticity than patients with chronic dissection.

Conclusions: The principle clinical findings suggest that TEVR is able to provide good protection from aortic-related death in the mid-term, but with a high rate of aortic reintervention. Analysis of aortic morphology suggested that aortic remodelling in subacute patients is similar to the acute group. Retention of aortic plasticity in the subacute group lengthens the therapeutic window for the treatment of uncomplicated type B dissection.

Influence of Cardiovascular Risk Factors on Levels of Matrix Metalloproteinases 2 and 9 in Human Abdominal Aortic Aneurysms

Dilmé J.-F., Bellmunt S., Camacho M., Solà-Villà D., Romero J.-M., Escudero J.-R., Vila L. Eur J Vasc Endovasc Surg 2014;48:372-9.

Objective: To evaluate the influence of cardiovascular risk factors on levels of matrix metalloproteinases (MMP) 2 and 9 in human abdominal aortic aneurysms (AAA).

Methods: Aortic samples were collected from patients who underwent AAA repair (n = 89). Patients were stratified according to the maximum transverse aorta diameter: small diameter (<55 mm), moderate diameter (55–69.9 mm) and large diameter (≥70 mm). Aortic walls were studied using real-time PCR and immunohistochemistry. MMP-2, MMP-9, α-actin, CD45, and CD68 transcript levels were determined relative to β-actin. Quantitative data were expressed as median (IQ-range).

Results: No differences were found in MMP-2 expression between the patient groups, which was mainly associated with vascular smooth muscle cells (VSMC); however, MMP-9 displayed the maximum level in the moderate-diameter group, associated with infiltrating macrophages. Current smoking (CS) and renal insufficiency (RI) significantly increased local levels of MMP-2 (CS 349.5 [219.5–414.1] vs. no-CS 184.4 [100.0–320.5]; p < .008; RI 286.8 [189.6–410.8] vs. no-RI 177.3 [99.3–326.9]; p = .047). Nevertheless, after stepwise linear regression analysis only CS remained as an independent variable predicting local levels of MMP-2 (p = .002). No risk factors influenced local levels of MMP-9.

Conclusions: The results show that local levels of MMP-2, an important factor for AAA development, were increased in current smoking AAA patients. MMP-2 was mainly associated with VSMC. It is suggested that MMP-2 could contribute significantly to the increased AAA growth rate observed in current smoking patients. These findings support inclusion of smokers in screening for aneurysmal disease, and emphasize the need for more aggressive monitoring of aneurysmal disease outside the surgical range in patients who smoke at the time of diagnosis and in those who continue to smoke during follow-up.

Type II Endoleak: Conservative Management Is a Safe Strategy

Sidloff D.A., Gokani V., Stather P.W., Choke E., Bown M.J., Sayers R.D. Eur J Vasc Endovasc Surg 2014;48:389-97.

Objective: Type II endoleak is the most common complication after endovascular abdominal aortic aneurysm repair (EVAR); however, its natural history is unclear. The aim of this study was to examine the incidence and outcomes of type II endoleak, at a single institution after EVAR.

Methods: A total of 904 consecutive patients who underwent EVAR between September 1995 and July 2013 at a single centre were entered onto a prospective database. All patients were followed up by duplex ultrasound (DUSS). Patients who developed type II endoleak were compared for preoperative demographics, mortality, and sac expansion.

Results: A total of 175(19%) patients developed type II endoleak over a median follow-up of 3.6 years (1.5–5.9 years); 54% of type II endoleaks spontaneously resolved within 6 months (0.25–1.2 years). No difference was found in preoperative demographics or choice of endograft between the two groups. Survival was significantly higher in the group with type II endoleak (94.1% vs 85.6%; p = .01) and this effect was most pronounced in those with late type II endoleaks (97.7% vs. 85.6% p = .004). No difference was seen in aneurysm-related mortality or rate of type I endoleak between the two groups. Freedom from sac expansion (>5 mm from preoperative diameter) was significantly lower in the group of patients with type II endoleak (82.5% vs. 93.2%, p = .0001); however, at a threshold of >10 mm from preoperative diameter no difference was seen.

Conclusions: Patients with isolated type II endoleak demonstrate equivalent aneurysm-related mortality and an improved survival.

Significant Savings with a Stepped Care Model for Treatment of Patients with Intermittent Claudication

Fokkenrood H.J.P., Scheltinga M.R.M., Koelemay M.J.W., Breek J.C., Hasaart F., Vahl A.C., Teijink J.A.W. Eur J Vasc Endovasc Surg 2014;48:421-7.

Objectives: International guidelines recommend supervised exercise therapy (SET) as primary treatment for intermittent claudication (IC). The aim of this study was to calculate treatment costs in patients with IC and to estimate nationwide annual savings if a stepped care model (SCM, primary SET treatment followed by revascularization in case of SET failure) was followed.

Methods: Invoice data of all patients with IC in 2009 were obtained from a Dutch health insurance company (3.4 million members). Patients were divided into three groups based on initial treatment after diagnosis (t_0). The SET group received SET initiated at any time between 12 months before and up to 3 months after t_0. The intervention group (INT) underwent endovascular or open revascularization between t_0 and $t_{+3\ \text{months}}$. The third group (REST) received neither SET nor any intervention. All peripheral arterial disease related invoices were recorded during 2 years and average costs per patient were calculated. Savings following use of a SCM were calculated for three scenarios.

Results: Data on 4954 patients were analyzed. Initial treatment was SET (n = 701, 14.1%), INT (n = 1363, 27.5%), or REST (n = 2890, 58.3%). Within 2 years from t_0, invasive revascularization in the SET group was performed in 45 patients (6.4%). Additional interventions (primary at other location and/or re-interventions) were performed in 480 INT patients (35.2%). Some 431 REST patients received additional SET (n = 299, 10.3%) or an intervention (n = 132, 4.5%). Mean total IC related costs per patient were €2,191, €9851 and €824 for SET, INT, and REST, respectively. Based on a hypothetical worst, moderate, and best case scenario, some 3.8, 20.6, or 33.0