The Association between Iliac Fixation and Proximal Stent-graft Migration during EVAR Follow-up: Mid-term Results of 154 Talent Devices

Waasdorp E.J., de Vries J.-P.P.M., Sterkenburg A., Vos J.-A., Kelder H.J.C., Moll F.L., Zarins C.K. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objective: This study investigated the importance of iliac fixation to secure endograft fixation.

Materials and methods: Computed tomography (CT) scans of patients who underwent endovascular aneurysm repair with an endoprosthesis of great columnar strength (Talent™ stent graft) were analysed retrospectively. Patients were enrolled consecutively between June 2000 and January 2007 and prospectively followed up with serial CT imaging. The superior mesenteric artery was used as a reference point to determine endograft migration (centerline endograft displacement of ≥10 mm). Proximal and distal fixation lengths were defined as the length of the endograft that was in full apposition to the aortic neck or common iliac arteries, respectively.

Results: Proximal endograft migration occurred in 32 of 154 patients (21%) at a follow-up duration of 32 ± 14 months; 13 migrations required treatment (8%). Migration was more frequent in patients treated with aorto-uniiliac devices than bifurcation devices ($p < 0.008$). The migrator and non-migrator groups had similar demographic and abdominal aortic aneurysm (AAA) characteristics. The migrator group had significantly shorter proximal (30 ± 12 mm vs. 41 ± 13 mm, $P < 0.001$) and distal endograft fixation lengths (31 ± 18 mm vs. 47 ± 15 mm, $P < 0.001$). By multivariate regression analysis, proximal and distal endograft fixations were significant predictors for endograft migration at follow-up ($P < 0.001$).

Conclusion: Iliac endograft fixation, along with proximal fixation, is a significant predictor for endograft migration.

Below-knee Bare Nitinol Stent Placement in High-risk Patients with Critical Limb Ischaemia and Unlimited Supragenicular Inflow as Treatment of Choice

Donas K.P., Schwindt A., Schönefeld T., Tessarek J., Torsello G. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Purpose: To evaluate the effectiveness of nitinol stent placement in long infrapopliteal lesions in patients with critical limb ischaemia.

Materials and methods: Between January 2005 and January 2008, 34 high-risk patients (18 female; mean age: 73.8 ± 6.1 years) with critical limb ischaemia underwent infragenicular stenting. They had serious cardiovascular co-morbidities (>3, such as chronic obstructive pulmonary disease (COPD), congestive heart failure and coronary artery occlusive disease), American Society of Anaesthesiologists score of 3 or more, previous myocardial infarction, coronary stent or bypass. The mean stenosis length was 6.5 ± 0.9 cm (range: 2.2–8 cm), and the mean occlusion length was 7.5 ± 2.9 cm (range: 3–9.6 cm). Primary stent implantation was performed for long stenosis or occlusion based on the TransAtlantic InterSociety Consensus (TASC) C and D classification, secondary stenting for flow-limiting dissections or elastic recoil after balloon dilatation. All patients who returned to the outpatient clinic were assessed for claudication by clinical examination, ankle–brachial index (ABI) measurements, colour flow and duplex Doppler ultrasound (US). Digital subtraction angiography was performed if restenosis or re-occlusion was identified by Doppler US or transcutaneous measurement of partial oxygen pressure ($TcpO_2$) measurements, when appropriate.

Results: The technical success rate was 97.1% (33 of 34 cases). The crude rate of primary patency rate was 91.1% during a follow-up period of 10.4 ± 7.3 months. The mean ankle–brachial index increased significantly following intervention (0.45 ± 0.25–0.92 ± 0.13, $p < 0.001$).

Two patients underwent successful redo angioplasty after tibioperoneal interventions due to in-stent restenosis (>70%) with relevant limitation of pain-free walking distance. In another patient, bypass surgery to the anterior tibial artery 6 months after primary intervention was necessary due to rest pain. Two patients required surgical revision of the femoral artery after antegrade access. No procedure-related death was recorded in the entire follow-up period.

Conclusions: The mid-term outcome underscores infrapopliteal stent placement as a reliable treatment option in patients with critical limb ischaemia. In patients at high risk for crural bypass, with no flow-limiting supragenicular lesions, below-knee stent-supported angioplasty should be considered as a first choice of treatment.

Molecular Pathology in Vulnerable Carotid Plaques: Correlation with [18]-Fluorodeoxyglucose Positron Emission Tomography (FDG-PET)

Græbe M., Pedersen S.F., Borgwardt L., Højgaard L., Sillesen H., Kjær A. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objectives: Atherosclerosis is recognised as an inflammatory disease, and new diagnostic tools are warranted to evaluate plaque inflammatory activity and risk of cardiovascular events. We investigated [18]-fluorodeoxyglucose (FDG) uptake in vulnerable carotid plaques visualised by positron emission tomography (PET). Uptake was correlated to quantitative gene expression of known markers of inflammation and plaque vulnerability.

Methods: Ten patients with recent transient ischaemic attack and carotid artery stenosis (>50%) underwent combined FDG-PET and computed tomography angiography (CTA) the day before carotid endarterectomy. Plaque mRNA expression of the inflammatory cytokine interleukin 18 (IL-18), the macrophage-specific marker CD68 and the two proteinases, Cathepsin K and matrix metalloproteinase 9 (MMP-9), were quantified using real-time quantitative polymerase chain reaction.

Results: Consistent up-regulation of CD68 (3.8-fold ± 0.9; mean ± standard error), Cathepsin K (2.1-fold ± 0.5), MMP-9 (122-fold ± 65) and IL-18 (3.4-fold ± 0.7) were found in the plaques, compared to reference-artery specimens. The FDG uptake by plaques was strongly correlated with CD68 gene expression ($r = 0.71$, $P = 0.02$). Any correlations with Cathepsin K, MMP-9 or IL-18 gene expression were weaker.

Conclusions: FDG-PET uptake in carotid plaques is correlated to gene expression of CD68 and other molecular markers of inflammation and vulnerability.

Contrast Carotid Ultrasound for the Detection of Unstable Plaques with Neoangiogenesis: A Pilot Study

Giannoni M.F., Vicenzini E., Citone M., Ricciardi M.C., Irace L., Laurito A., Scucchi L.F., Di Piero V., Gossetti B., Mauriello A., Spagnoli L.G., Lenzi G.L., Valentini F.B. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Objectives: To evaluate whether contrast ultrasonography can be used to distinguish asymptomatic from symptomatic carotid plaques and provide insight into underlying pathophysiological differences.

Design: Contrast Carotid ultrasound was performed in both symptomatic and asymptomatic patients referred for carotid endarterectomy.

Materials and methods: Of 77 consecutive patients referred for carotid artery evaluation, 64 underwent carotid endarterectomy for asymptomatic cerebrovascular disease and 9 underwent urgent surgery for acute neurological deficits with hemiparesis. The endarterectomy specimens were assessed immunohistologically.

Results: In all 9 patients undergoing urgent surgery, contrast ultrasonography showed the accumulation of diffuse microbubble contrast at the base of the carotid plaque. This pattern was observed only in 1/64 of the patients undergoing surgery for asymptomatic carotid disease. Immunohistologically staining of the endarterectomy specimens showed that the area of microbubble contrast at the base of the symptomatic plaques was associated with an increased number of small diameter (20–30 μm) microvessels staining for vascular endothelial growth factor (VEGF).

Conclusions: Contrast carotid ultrasonography may allow the identification of microvessels with neoangiogenesis at the base of carotid plaques, and differentiate symptomatic from asymptomatic plaques.

Functional Imaging of Atherosclerosis to Advance Vascular Biology

Sakalihasan N., Michel J.B. Eur J Vasc Endovasc Surg 2009;xx:xx-xx.

Preliminary events leading to the rupture of atherosclerotic plaques or aneurysmal wall expansion undoubtedly are linked to altered and increased metabolism of cells in the vascular wall. To allow *in vivo* identification of this local activity, imaging techniques such as positron emission tomography (PET) and contrast ultrasonography may be used. However, the use of complementary multimodal imaging methods, such as computed tomography (CT), magnetic resonance imaging (MRI), single photon emission computed tomography (SPECT), etc., can inform about other processes, including vascular wall calcification, haemosiderin deposits, apoptosis and accumulation of activated platelets in the arterial wall. Such techniques may be used as an adjunct in following the evolution of the disease, as well as having crucial roles as molecular and cellular probes of arterial disease. Therefore, functional imaging techniques may be able to help us take more reliable decisions on the need for medical or surgical treatment of arterial disease.