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Galectin-3, Carotid Plaque Vulnerability, and Potential Effects of Statin Therapy

Kadoglou N.P.E., Sfyroeras G.S., Spathis A., Gkekas C., Gastounioti A., Mantas G., Nikita K.S., Karakitsos P., Liapis C.D. Eur J Vasc Endovasc Surg 2014;49:4-9.

Objectives: Galectin-3, a member of galectines, a family of β-galactoside-specific lectins, has been reported to propagate vascular inflammation. The role of galectin-3 in carotid atherosclerosis is controversial. The aim of this study was to investigate the relationship of galectin-3 with plaque vulnerability in patients with high grade carotid stenosis.

Methods: This was a cross sectional study of patients undergoing carotid endarterectomy (CEA). Carotid plaques obtained from 78 consecutive patients (40 symptomatic [SG], 38 asymptomatic [AG]) undergoing CEA were histologically analyzed for galectin-3, macrophages (CD68) and laminin. Pre-operatively the biochemical profile and plaque echogenicity (gray-scale median, GSM) score were determined.

Results: There were no significant differences in clinical and demographic parameters between SG and AG ($p > .05$). The SG had a lower GSM score (44.21 ± 18.24 vs. 68.79 ± 28.79, $p < .001$) and a smaller positive stained area for galectin-3 (4.89 ± 1.60% vs. 12.01 ± 5.91%, $p < .001$) and laminin (0.88 ± 0.71% vs. 3.46 ± 2.12%, $p < .001$) than the AG. On the other hand, intra-plaque macrophage content was increased in SG ($p < .001$). For the whole cohort, symptomatic status was independently associated with intra-plaque contents of both galectin-3 (OR = 0.634, $p < .001$), and GSM score (OR = 0.750, $p < .001$). Notably, patients on long term statin treatment had elevated galectin-3 and lowered macrophage intra-plaque concentrations compared with those on short term treatment ($p < .05$).

Conclusions: A low galectin-3 intra-plaque concentration seems to correlate with clinically and ultrasonically defined unstable human carotid plaques. Long term statin treatment may induce increase of intra-plaque galectin-3 concentration mediating plaque stabilization.

Mid-Term Results of EVAR in Severe Proximal Aneurysm Neck Angulation

Oliveira N.F.G., Bastos Gonçalves F.M., de Vries J.-P.P.M., Ultee K.H.J., Werson D.A.B., Hoeks S.E., Moll F., van Herwaarden J.A., Verhagen H.J.M. Eur J Vasc Endovasc Surg 2014;49:19-27.

Objective: To determine if mid-term outcome following endovascular aneurysm repair (EVAR) with the Endurant Stent Graft (Medtronic, Santa Rosa, CA, USA) is influenced by severe proximal neck angulation.

Methods: A retrospective case–control study was performed using data from a prospective multicenter database. All measurements were obtained using dedicated reconstruction software and center-lumen line reconstruction. Patients with neck length >15 mm, infrarenal angle (β) >75°, and/or suprarenal angle (α) >60°, or neck length >10 mm with β >60°, and/or α >45° were compared with a matched control group. Primary endpoint was primary clinical success. Secondary endpoints were freedom from rupture, type 1A endoleak, stent fractures, freedom from neck-related reinterventions, and aneurysm-related adverse events. Morphological neck variation over time was also assessed.

Results: Forty-five patients were included in the study group and were compared with a matched control group with 65 patients. Median follow-up time was 49.5 months (range 30.5–58.4). The 4-year primary clinical success estimates were 83% and 80% for the angulated and nonangulated groups (p=.42). Proximal neck angulation did not affect primary clinical success in a multivariate model (hazard ratio 1.56, 95% confidence interval 0.55–4.41). Groups did not differ significantly in regard to freedom from rupture (p=.79), freedom from type 1A endoleak (p=.79), freedom from neck-related adverse events (p=.68), and neck-related reinterventions (p=.68). Neck angle reduction was more pronounced in patients with severe proximal neck angulation (mean δα −15.6°, mean δβ −30.6°) than in the control group (mean δα −0.39°, mean δβ −5.9°) ($p < .001$).

Conclusion: Mid-term outcomes following EVAR with the Endurant Stent Graft were not influenced by severe proximal neck angulation in our population. Despite the conformability of the device, moderate aortic neck remodeling was identified in the group of patients with angulated neck anatomy on the first computed tomography scan after implantation with no important further remodeling afterwards. No device integrity failures were encountered.

Abdominal Aortic Aneurysm Diameters: A Study on the Discrepancy between Inner to Inner and Outer to Outer Measurements

Meecham L., Evans R., Buxton P., Allingham K., Hughes M., Rajagopalan S., Fairhead J., Asquith J.R., Pherwani A.D. Eur J Vasc Endovasc Surg 2014;49:28-32.

Introduction: The NHS Abdominal Aortic Aneurysm Screening Programme (NAAASP) uses the maximal anterior to posterior (AP) inner-to-inner (ITI) wall diameter in sizing aortic dimensions when screening with ultrasound. It is recognised that ITI measurements are smaller than outer-to-outer (OTO) measurements, and the primary aim was to calculate the absolute difference in AP ITI and OTO aortic measurements across varying aortic diameters. The secondary aim was to estimate the potential number of patients lost from the screening programme.

Methods: Since April 2012, patients outside the screening programme that undergo ultrasound of abdominal aortas have their ITI and OTO measurements recorded. These measurements were compared retrospectively and analysed for variability at threshold sizes of AAAs.

Results: From May 2012 to October 2013, 452 abdominal aortic ultransound scans recorded both ITI and OTO measurements. The majority (81%) were performed on men with the mean age of 78 years. The mean difference between ITI and OTO measurements was 4.21 mm ($p < .001$). There was no difference between the genders. Thresholds were created for analysis between different ITI and OTO aortic diameters; these were <3 cm, 3.1–4 cm, 4.1–5 cm, and >5 cm. There was no significant difference between the means at each threshold size for ITI diameter ($p = .758$). In the first 2 years from April 2012, 15,447 men underwent screening. Of these, 177 (1.14%) had sub-threshold ITI aortic diameters between 2.6 cm and 2.9 cm. This would upscale to 5,316 men nationally.

Conclusion: We have demonstrated a consistent and significant 4 mm difference between ITI and OTO diameters in live scanning. Lowering the threshold for entry into a surveillance AAAs to an ITI diameter of 26 mm rather than the current 30 mm is advocated. An alternative cost-effective way is to rescreen this small sub-group at 5 or 7 years.

Variability of Origin of Splanchnic and Renal Vessels From the Thoracoabdominal Aorta

Mazzaccaro D., Malacrida G., Nano G. Eur J Vasc Endovasc Surg 2014;49:33-8.

Objective: To analyze the variability of origin of the celiac trunk (CT), the superior mesenteric artery (SMA), the right renal artery (RRA), and the left renal artery (LRA) in terms of mutual distances, angle from the sagittal aortic axis (clock position), and ostial diameters on computed tomography angiographies (CTAs) in three groups of patients.

Methods: One hundred and fifty CTAs of 50 patients with a non-dilated thoracoabdominal aorta (group A), 50 with thoracoabdominal aneurysm (B), and 50 with infrarenal aneurysm (C) were reviewed. The measurements performed on CTAs, as well as the patients' age, sex, and body surface area, were analyzed. p values <.05 were considered statistically significant.

Results: The clock position of the CT and the SMA, the diameters of all vessels, and the distance of the CT–SMA followed a Gaussian distribution. In contrast, the clock position of the renal vessels did not follow a normal distribution, and nor did the distances of the SMA–RRA, SMA–LRA, RRA–LRA or the distances between the renal arteries and the aortic bifurcation. The same values did not differ significantly among the three groups, with the exception of the distances between the renal