were significantly different in dissections complicated by aneurysm formation. Thus, CFD may assist in predicting which patients may benefit from early stent grafting.

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PS208.
Increased Pressure Gradients Within an Aortic Arch Endograft Are Associated With Rapid Development of In-Stent Stenosis in a Porcine Model
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Objectives: To describe the association between pressure gradients within fenestrated aortic arch endografts and the rapid development of in-stent branch stenosis in a porcine model.

Methods: Ten pigs underwent implantation of a modular fenestrated stent graft in the aortic arch, comprising a main, tapered module with branches to the ascending aorta (AA) and left subclavian artery (LSA). In group 1 (n = 6), the leading tapered end of the main module was deployed in the innominate artery (IA) and the distal, large-caliber end in the descending thoracic aorta (DTA), orientated so that the fenestrations faced the distal, large-caliber end in the descending thoracic aorta (DTA). In group 2 (n = 4) animals underwent a preliminary LSA-to-carotid artery bypass, followed by implantation of a modified endograft with a larger cross-sectional area of the fenestration for the ascending aorta (DTA), the IA and LSA were measured intraprocedurally and at angiography at 1, 3, and 6 months. Pigs were euthanized after 6 months.

Results: Pressure gradients in the main module, IA, LSA, and DTA were significantly higher in group 1 compared with group 2. Angiograms performed during the follow-up revealed severe in-stent stenosis within the AA and LSA stents in group 1 animals. No in-stent stenosis was seen in group 2 branch modules. Pressure gradients between the AA module and the endograft at different levels in the arch and DTA, the IA and LSA were measured intraprocedurally and at angiography at 1, 3, and 6 months. Pigs were euthanized after 6 months.

Conclusions: Elevated pressure gradients observed in aortic arch endografts appear to be associated with rapid development of in-stent stenosis in the porcine model, presumably due to significant hemodynamic disturbance. This potential complication should be taken into consideration when planning experimental arch stent grafts. Care should be taken to eliminate pressure gradients to avoid development of in-stent stenosis in this animal model.

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PS210.
Inhibition of VEGFR2 Reduces Angiogenic Microvessel Leakiness in Murine Vein Graft Atherosclerotic Lesions and Increased Plaque Stability
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Objectives: Immature plaque neovessels contribute to atherosclerotic plaque instability and intraplaque hemorrhage by leaking erythrocytes and leukocytes in the plaque. Vascular endothelial growth factor receptor 2 (VEGFR2), together with the angiopoietin (Ang)-Tie2 system, regulates the maturation of growing neovessels. We have previously shown that murine vein graft lesions exhibit massive plaque neovascularization and that leaky vessels and intraplaque hemorrhage contribute to lesion growth. We hypothesized that inhibition of VEGFR2 reduces angiogenesis and thus reduces microvessels as well as intraplaque hemorrhage.

Methods: Donor caval veins were engrafted in carotid arteries of recipient hypercholesterolemic ApoE3-Leiden mice (n = 14/group). Mice were treated at day 14, 17, and 21 with VEGFR2 blocking antibodies (DC101) or control immunoglobulin G antibodies (10 mg/kg). At day 28, mice were euthanized for histologic analysis of the vein grafts.

Results: Morphometric analysis revealed a striking 50% decrease in vein graft segments that contain leaky vessels in the DC101-treated group. This was accompanied by a significant 25-fold decrease in extravasated erythrocytes. Furthermore, lesions that exhibit intraplaque hemorrhage showed a strong increase in both Ang-I and Ang-2, indicative for immature neovessels. VEGFR2 blockade, however, did not affect the neovessel density in the lesions (control, 52 ± 19 neovessels/section; DC101, 63 ± 25 neovessels/section). Interestingly, the vein graft lesion area in the DC101 group was significantly reduced with 32% compared with the control group. Moreover, plaque stability was clearly increased in DC101-treated mice, determined by a 50% increase in collagen content and a 120% increase in SMC content.

Conclusions: Blockade of VEGFR2 leads to reduced intraplaque hemorrhage, decreased vein graft lesion area, and increased plaque stability. This identifies plaque neovascularization as an attractive target for the treatment of unstable atherosclerotic diseases.

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PS212.
Increased Circular RNA-16 in Acutely Symptomatic Carotid Plaques: A Novel Mediator of Carotid Plaque Rupture
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Objectives: Circular RNAs (circRNAs) are dynamically expressed during development and possess binding sites for microRNAs (miRs), small RNAs that negatively regulate gene expression. We recently demonstrated that miR-221, which is associated with vascular smooth muscle cell (VSMC) proliferation and inhibition of apoptosis, is decreased in acutely symptomatic carotid plaques. Because circRNA-16 possesses binding sites for miR-221 through seed sequences found within, we hypothesized that circRNA-16 is increased in acutely symptomatic carotid plaques.

Methods: Relative changes in gene expression levels of circRNA-16 were compared using a real-time polymerase chain reaction (PCR) assay and the ΔΔCt method. All samples were run in duplicate; mean and standard error were calculated. One-way analysis of variance with the Tukey test was used to determine significance between groups.

Results: Expression of circRNA-16 was confirmed in human VSMC using PCR and resistance to RNase H. To investigate its role in carotid plaque rupture, levels of circRNA-16 were quantified in patients undergoing urgent carotid endarterectomy for acute neurologic symptoms (n = 27), compared with asymptomatic carotid plaques (n = 19). In contrast to miR-221, circRNA-16 is increased in the urgent group compared with the asymptomatic carotid plaque group (1.51 ± 0.26 vs 1.00 ± 0.10, P = .03; Fig).

Conclusions: We demonstrate circRNA-16 levels are increased and miR-221 levels decreased in acutely ruptured carotid plaques. Furthermore, our data suggest that a circRNA-16/miR-221 axis may be important in fibrous cap degradation and rupture during the transition from a stable to an unstable carotid atherosclerotic plaque.

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PS214.
Agreement of Repeatability Coefficients for Within-Subject Carotid Artery Velocities with Snoring Application
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Objectives: To determine (1) within-subject variance in carotid artery velocities as measured by ultrasound (US) and (2) if snoring significantly alters carotid velocities.

Methods: Eight individuals underwent 32 bilateral carotid artery US exams by two Registered Vascular Technologist (RVTs; four exams/subject, four subjects/RVT). Steps were taken to ensure measurements were made at identical sites under similar parameters for subsequent exams. Peak systolic velocity (PSV) and end-diastolic velocity (EDV) were measured at eight locations. For each location, limits of agreement was used to calculate PSV and EDV repeatability coefficients, which are the limits within which 95% of the differences will lie for two measurements made on the same subject. Repeatability coefficients were then used to determine significance for observed velocity changes in carotid arteries with and without stenosis during mock snoring. They were also used to access velocity variability in patients scheduled for carotid endarterectomies (CEAs). All US exams were performed in an Intersocietal Accreditation Commission vascular testing accredited laboratory by RVTs.

Results: Repeatability coefficients for RVT A ranged from 34 to 44 cm/s for PSV and 10 to 22 cm/s for EDV. For RVT B they ranged from 30 to 65 and 8 to 19 cm/s for PSV and EDV, respectively. Maximum values occurred on the ostia of the internal carotid artery (ICA) and in the proximal ICA for RVTs A and B, respectively. In nonstenosed arteries, snoring most frequently caused a significant change in the PSV of the proximal ICA and in the EDV of the mid-ICA where it occurred 15% of the time (three of 20 arteries). However, the effect of snoring was greatest in stenosed arteries. In 38% (three of eight) snoring caused a significant increase in the PSV and EDV of the proximal ICA and in the PSV of the mid-ICA.

Conclusions: Repeatability coefficients can be used to determine significant changes in carotid artery velocities within stenosis categories as measured by US. There is a possible connection between snoring, carotid velocities, and stenosis that warrants further investigation to determine if it is part of the mechanism by which snoring may increase stroke risk.