increased when siRNA was complexed with PEI. The amount of siRNA adsorbed generally appeared greater in ePET than in PTFE fabrics. Repeated dipping of ePET in siGLO Red/PEI solution significantly increased siRNA adsorption vs single dipping.

Conclusions: siRNA adsorption to ePET and PTFE surfaces is significantly increased if the siRNA is complexed with PEI. Preliminary data in this study suggest that siRNA adsorbs better to ePET than PTFE. Further, repeated dipping of ePET additionally increased adsorption of siRNA to fabric. Thus, coating of ePET with siRNA/PEI may be a method to improve graft patency.

Integrin ß-1 Regulates Eph-B4–Mediated Vein Graft Adaptation

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Introduction and objectives: Eph-B4, the receptor tyrosine kinase that serves as the embryonic venous fate determinant, is decreased in association with the successful adaptation of surgical vein grafts to the arterial environment. Stimulation of Eph-B4 recovers the native phenotype. However, the Ephrin-B2 protein, the juxtacrine ligand for Eph-B4, is not expressed in veins; as such, the adult physiologic controller of Eph-B4 is unknown. We explored whether the mechanosensitive integrin-β-1 molecule is an upstream regulator of Eph-B4 signaling.

Methods: Eph-B4–positive endothelial cells and Eph-B4–negative Cos cells transfected with wild-type or mutant W804A Eph-B4 were stimulated with type I collagen and anti–integrin-β-1 activating antibody (P4G11) and analyzed with Western blotting. Colocalization was determined using immunofluorescence. Unilateral external carotid artery ligation was performed on heterozygous integrin-β-1 knockout (Het-B1-KO) mice. Carotid arteries were examined on day 14 and jugular veins on days 1 and 7. Veins from Het-B1-KO mice were placed as aortic interposition grafts into wild-type mice and examined at day 21.

Results: Endothelial cells stimulated with collagen or P4G11 increased Eph-B4 phosphorylation. Eph-B4 and integrin-β-1 colocalized on both endothelial cells and wild-type Eph-B4 transfected Cos cells after stimulation with collagen; mutant W804A Eph-B4 transfected cells were unable to phosphorylate Eph-B4. Het-B1-KO mice that underwent unilateral ligation of the external carotid showed aberrant vascular remodeling. Het-B1-KO vein grafts showed approximately threefold increased neointimal thickening compared with wild-type controls.

Conclusions: Integrin-β-1 is present on endothelial cells, responds to hemodynamic forces, induces Eph-B4 signaling, and modifies vessel and vein graft remodeling. These results connect hemodynamic forces to vein graft adaptation through extracellular matrix interactions. Integrin-β-1 is an upstream regulator of Eph-B4 signaling during vein graft adaptation and may represent a novel therapeutic target with the potential to limit neointimal hyperplasia in vein grafts.

Prior Contralateral Amputation Predicts Worse Outcomes For Lower Extremity Bypasses in the Intact Limb

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Introduction and objectives: A history of a contralateral amputation as a potential predictor of outcomes after lower extremity bypass (LEB) for critical limb ischemia (CLI) has not been studied. We sought to determine if a prior contralateral lower extremity amputation predicts worse outcomes in patients undergoing LEB in the remaining intact limb.

Methods: All patients undergoing infrainguinal LEB for CLI between 2003 and 2010 within the Vascular Study Group of New England (VSGNE) were reviewed. Patients were stratified by whether they had previously undergone a contralateral amputation before LEB. Primary end points included major amputation and graft occlusion at 1 year postoperatively. Secondary end points included in-hospital major adverse events and death at 1 year.

Results: Of 2636 LEB procedures, 228 (8.6%) were performed in patients who had undergone a prior contralateral amputation. Patients with a prior amputation compared with those without were younger (66.5 vs 68.7; $P = .034$) and were more likely to have congestive heart failure (24.9% vs 16.3%; $P = .002$), hypertension (94.4% vs 85.4%, $P = .015$), renal insufficiency (26.0% vs 13.8%, $P = .0002$), and dependence on hemodialysis (13.6% vs 6.0%, $P = .0002$). These patients experienced increased in-hospital major adverse events, including myocardial infarction, congestive heart failure, deterioration in renal function, and respiratory complications (Table). Patients with prior contralateral amputation experienced increased rates of graft occlusion and amputation at 1 year, but there was no difference in mortality. Multivariable analysis showed prior contralateral amputation was an independent predictor (odds ratio [95% confidence interval]) of amputation (1.73 [1.06-2.83] $P = .027$) and graft occlusion (1.93 [1.39-2.68] $P < .0001$) at 1 year.

Table.

	No prior contralateral amputation	*Previous contralateral amputation*	P *value*
Post-operative complications			
Any in-hospital major adverse event	12.5%	19.0%	0.044
MI	4.2%	8.9%	0.002
Dysrhythmia	4.4%	6.5%	0.156
CHF	3.4%	6.1%	0.044
Change in renal function	4.7%	9.0%	0.006
Respiratory	2.3%	37.5%	0.034
One-year complication			
Graft occlusion	16.7%	37.5	<0.0001
Amputation	6.7%	15.9%	<0.0001
Mortality	10.4%	15.8%	0.160

Conclusions: Patients with prior contralateral amputations who present with CLI in the intact limb represent an extremely high-risk population. When LEB is considered in this setting, physicians and patients should expect increased rates of perioperative adverse events, increased rates of 1-year graft occlusion, and decreased rates of limb salvage compared with patients who do not have a contralateral amputation.

Ultrasound-Guided Angioplasty of Autogenous Arteriovenous Fistulas in the Office Setting

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Introduction and objectives: There has been an increasing awareness of the superiority of native arteriovenous fistulas (AVFs) over prosthetic grafts for dialysis access. Many AVFs fail to mature, however, and others develop stenosis while in use. There is growing experience in treating these patients in the interventional suite with percutaneous balloon angioplasty. These procedures, however, are expensive and uncomfortable for the patients, are inconvenient for patients and physicians, and involve exposure to radiation and intravenous contrast agents in patients who are often not on dialysis. This study reviews our experience with ultrasound-guided angioplasty of AVFs in the office setting.

Methods: A retrospective review was performed of all patients treated in our practice with ultrasound-guided AVF angioplasty from May 2009 to April 2011. The need for intervention was determined by examination and duplex ultrasound imaging. All patients referred to the practice with failing or nonmaturing AVFs were treated in the office under ultrasound guidance, unless a central venous stenosis was suspected. All procedures were performed with local anesthesia by a single surgeon, and ultrasound scans before, during, and after the procedure ultrasounds were performed in a single vascular laboratory.

Results: The study included 30 patients with 31 AVFs who underwent 55 interventions: 48 for AVFs failing to mature and 7 for stenosis in functioning AFVs. Patency at 90 days was 93%. Overall complication rate was 11%. In two patients, a proximal stenosis could not be crossed, of which one required surgical revision and one refused further treatment and thrombosed. There were four peri-AVF hematomas, and three of these resulted in AFV thrombosis. No patients required hospitalization or urgent surgical intervention, and functional fistula was achieved in 85% of patients treated for AVF failing to mature.

Conclusions: AVF intervention can be performed safely and effectively under ultrasound guidance in the office setting and is a valuable tool in the management of dialysis access patients.