diameter and if preoperative and postoperative imaging was available for review. Patients were assessed with computed tomography (CT) scan at 1, 6, and 12 months and yearly thereafter. Aneurysm sac regression was defined as >5 mm of decrease in the minor axis of the aneurysm sac between the first postoperative CT scan and the subsequent follow-up CT scan, and growth was defined as >5 mm of increase in minor axis.

Results: During the study period, 254 patients underwent EVAR, and 187 met the inclusion criteria. A total of 117 patients underwent EVAR with a modular bifurcated graft: AneuRx in 3, Gore Excluder in 97, Medtronic Talent in 11, and Cook Zenith in 6. Seventy underwent EVAR with the Endologix unibody design stent graft. Overall follow-up was 40.2 months. The rates of postoperative aneurysm sac regression, stability, and increase were 51.3%, 41.9%, and 6.8% in the modular bifurcated group and were 52.9%, 38.6%, and 8.6% in the unibody group ($P = .85$). The unibody group had fewer type II endoleaks (18.6%) compared with the modular bifurcated group (31.6%); this result approached statistical significance ($P = .051$). In each group, endoleak was associated with a greater rate of sac growth, and freedom from endoleak was associated with a higher rate of sac regression ($P < .001$).

Conclusions: Aneurysm sac regression is associated with freedom from endoleak, and sac growth is associated with endoleak. There is no significant difference in aneurysm sac regression between the modular bifurcated and unibody stent designs. However, sac behavior may be indirectly related to stent graft design through the influence of endoleak. There is a trend toward fewer type II endoleaks after EVAR with unibody grafts. Minimizing endoleak should be the focus of future stent graft design modifications.

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Comparison of Vascular Remodeling And Integration Between the Bioresorbable Poly-L-Lactic Acid Scaffold Stent and the Metallic Stent in Porcine Iliac Artery

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Objective: Bare-metal stents (BMSs) and drug-eluting stent (DESs) have already been proven useful in clinical practice. Because all BMSs and DESs are permanent implants, no procedure can remove them other than surgery. In-stent restenosis, which is luminal renarrowing at a stented segment, remains a major clinical limitation. Bioresorbable scaffolds (BRSs), which degrade over time, have the potential to overcome the concerns associated with BMSs and DESs to improve the possibility for later additional revascularization, to reduce the risk of late stent thrombosis, and to be compatible with noninvasive imaging technologies. The aim of this study was to assess the technical feasibility and biocompatibility of the bioresorbable poly-L-lactic acid scaffold compared with BMSs in porcine iliac arteries.

Methods: BRSs and BMSs were implanted bilaterally in the iliac arteries of five miniature swine. Digital subtraction angiography and intravenous ultrasound (IVUS) were performed before and immediately after the stent placement and repeated before euthanasia at 6 weeks. In IVUS analysis, remodeling was calculated as external elastic lamina area at 6 weeks of follow-up minus the external elastic lamina area immediately after the stent placement. Late lumen loss was calculated as lumen area at immediately after the stent placement minus lumen area at 6 weeks of follow-up. Stented segments were explanted and processed for quantitative histomorphometry. Vascular injury and inflammation scores were assigned to the stented segments.

Results: All BRSs and BMSs were patent at the end of follow-up. The vessel lumen was significantly smaller in the BRS group (3.45 mm^2 vs 11.9 mm^2; $P < .001$; Table; Fig). The percentage area of stenosis was similar in both groups (63.1% vs 58.9%; $P = .524$). Neointimal area was significantly larger in the BMS group (5.83 mm^2 vs 16.9 mm^2; $P < .001$; Table), and media area was larger in the BRS group (5.08 mm^2 vs 3.09 mm^2; $P = .002$; Table). In IVUS analysis, late lumen loss and remodeling were similar in both groups ($P = .558$ and $P = .882$). In histopathologic analysis, there was no significant difference between the two groups in the vascular injury score and inflammatory score.

Conclusions: BRSs and BMSs have similar short-term outcomes in porcine iliac arteries. The reactions of vessel wall were different between two groups in neointimal formation and media area enlargement.

Table. Histomorphomtey

	PLLA stent	*BMS*	P *value*
Lumen, mm^2	3.45 (1.82-6.65)	11.9 (2.55-21.7)	.000
IEL, mm^2	9.28 (2.69-10.90)	28.8 (21.0-32.1)	.000
EEL, mm^2	14.4 (8.99-22.2)	31.8 (24.1-34.9)	.000
Neointimal area, mm^2	5.83 (3.12-10.97)	16.9 (7.59-28.7)	.000
Media area, mm^2	5.08 (2.69-10.90)	3.09 (2.44-4.25)	.002
% area stenosis	63.1 (36.5-83.2)	58.9 (26.3-91.8)	.524

BMS, Bare-metal stent; *EEL*, the area within the external clastic lamina; *IEL*, the area within the internal elastic lamina; *PLLA stent*, poly-L lactic acid stent. Values are mean (range).

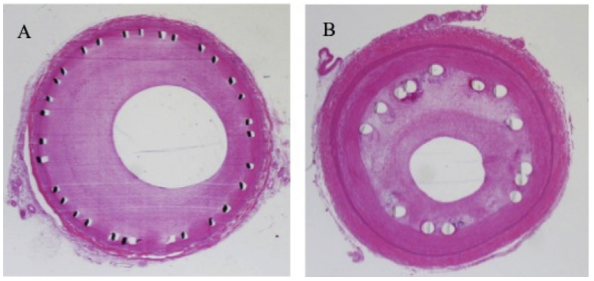

Fig. Representative photomicrographs of hematoxyline-eosine stained sections of porcine ikiac arteries 6wceks after two types of stent implantation. **(A)** Bare-metal stent **(B)** Bioresorbable PLLA stent.

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Amputation Trends for Patients With Lower Extremity Wounds due to Diabetes and Peripheral Artery Disease

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The Use of Cryopreserved Allograft in Patients With Dialysis Access Failure and Infection

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Objective: This study examined the use of cryopreserved allograft for hemodialysis access in patients with previous or current arm infection and no autogenous conduit availability.

Methods: Patients implanted with cryopreserved allograft for hemodialysis access between January 2004 and January 2014 were reviewed using a standardized, multi-institutional database. Demographic, comorbidity, procedural, and outcomes data were evaluated.

Results: A total of 258 patients (mean age, 62 years) underwent placement of cryopreserved vein (n = 243) or artery (n = 15) for hemodialysis access. Indications for use included high risk for infection in 143 (55%), history of infected prosthetic graft in 72 (28%), or current infection in 43 (17%). All patients had no autogenous veins available in the ipsilateral arm, and had a mean of 2.3 failed previous access grafts or fistula. Mean time from placement to first hemodialysis use was 29 days (range, 11-79 days). Local access complications included early thrombosis in 9 (3%), late thrombosis in 21 (8%), late infection in 18 (7%), graft stenosis in 12 (5%),

pseudoaneurysm formation in 6 (2%), and bleeding at the graft puncture site in 6 (2%). Hemodynamic complications included steal syndrome in 19 (7%) and venous hypertension in five (2%). Nine patients died before first use, and 17 patients required perioperative reintervention. Overall, patients required a mean of 0.6 interventions to maintain graft patency and use (Fig). Mean follow-up was 23 months. Of the 258 grafts implanted, 142 patients continue using their graft after a mean of 509 days (mean allograft fee per day of graft patency <$12.31). Grafts no longer in use had a prior mean usage of 463 days; the mean allograft fee per day of graft patency was $13.54.

Conclusions: Cryopreserved allograft for hemodialysis access is an alternative to prosthetic graft in patients with no autogenous conduit. It may be placed in an infected arm at the time of infected graft excision and demonstrates comparable patency to historic controls in patients who require a two-staged excision and reimplantation.

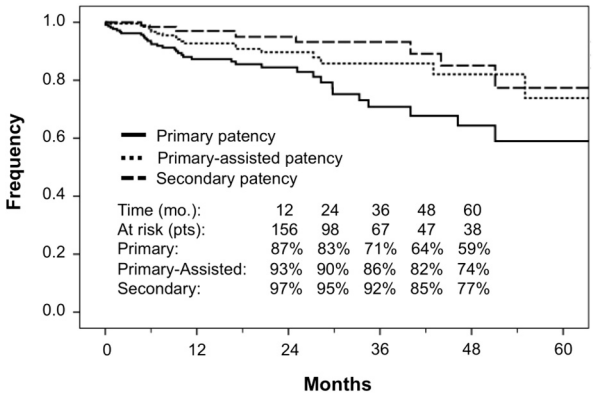

Fig. Primary, primary-assisted, and secondary patency of cryopreserved allografts placed for arteriovenous access.

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Postoperative Outcomes Correlate With Frailty Defined Using Vascular Quality Initiative Data

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Objective: Frailty is a multifactorial condition that correlates with clinical outcomes after surgery. We hypothesized that frailty could be defined using information collected as part of the Vascular Quality Initiative (VQI) and would correlate with vascular surgery postoperative outcomes.

Methods: We identified 15 VQI variables and grouped them into 10 categories that mapped to established characteristics in the validated Canadian Study of Health and Aging frailty index (Table). A frailty index was then calculated by scoring 1 point for any positive response mapping to a frailty category divided by the number of categories for which data existed (possible values of 0-1). The VQI-derived frailty index was then correlated with postoperative outcomes for 735 operations (carotid endarterectomy, 110; endovascular aneurysm repair, 99; open abdominal aortic aneurysm repair, 39; lower extremity bypass, 126; lower extremity endovascular repair, 291; open suprainguinal, 52; thoracic aortic endovascular repair, 18) entered into the VQI by a single institution from June 2010 to March 2015. Generalized estimating equations were used to account for multiple operations in some patients.

Results: The mean overall frailty score was 36.8 ± 17.8. A frailty score ≥0.3 was associated with older age, female gender, nonwhite race, higher American Society of Anesthesiologists Functional Classification, longer procedure times, more perioperative transfusions, nonambulatory status at discharge, and discharge to a care facility rather than home (all $P < .05$). In-hospital mortality was 3% (21 of 735), and patients who died had a significantly higher frailty score (45.4 ± 22.9 vs 36.5 ± 17.6; $P = .04$). Generalized estimating equation models showed death was associated with frailty score, higher age, nonelective indication for surgery, incoming transfer from another hospital, and more perioperative transfusions (all $P < .05$).

Conclusions: VQI data elements can be used to calculate a frailty score that is associated with adverse perioperative outcomes such as death, discharge to a care facility, and nonambulatory status. Further study will better define the appropriate use of the VQI-frailty score as a clinical decision-making tool.

Table. Vascular Quality Initiative (*VQI*) variables mapped to frailty categories

Frailty category (n =10)	*VQI variable (n =15)*
Hypertension	Hypertension
Congestive heart failure	Congestive heart failure
Myocardial infarction	• History of coronary artery disease (angina, MI) • Prior CABG/PCI • Positive cardiac stress test
Peripheral vascular disease	• Any ankle-brachial index <0.7 • Prior arterial vascular operation[a]
Renal impairment	• Creatinine >1.78 mg/dL • Dialysis
Diabetes mellitus	Diabetes mellitus
Lung or respiratory problem	Chronic obstructive pulmonary disease
Functional dependence	• Preadmission living (home/nursing home) • Preadmission ambulation[b]
Other medical problem	Anemia[c] (hemoglobin <13 g/dL, male; <12 g/dL, female)
Underweight	Body mass index <19 kg/m^2

CABG, Coronary artery bypass grafting; *MI,* myocardial infarction; *PCI,* percutaneous coronary intervention.

[a]Bypass, carotid endarterectomy, aneurysm repair, peripheral vascular intervention, major amputation.

[b]Ambulatory, ambulatory with assist, wheelchair, bedridden

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Blunt Aortic Injury: A Call for a New Classification System and Treatment Strategy

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Objective: The current Society for Vascular Surgery (SVS) classification scheme for blunt aortic injury (BAI), while descriptive, does not guide therapy. We propose a simplified classification scheme based on our prior publication and robust experience with BAI that is descriptive and guides therapy.

Methods: Patients presenting with BAI from January 1999 to September 2014 were identified from our institution's trauma registry. We divided patients into the following groups: group 1: prior to the first U.S. Food and Drug Administration (FDA)-approved thoracic endovascular device (1999-2005); group 2: FDA-approved thoracic endovascular aortic repair (TEVAR) devices (2005-2010); and group 3: FDA-approved BAI-specific devices (2010-present). Our classification scheme was the following: "minimal, " SVS grade 1 and 2; "moderate," SVS grade 3; and "severe," SVS grade 4.

Results: We identified 226 patients with a diagnosis of BAI (group 1, 75 patients; group 2, 84 patients; and group 3, 67 patients). Mean injury severity score was 39.5 (range, 16-75). Table I details the treatment of each group by our classification scheme. BAI-related in-hospital mortality was significantly higher before endovascular introduction, 14.6% vs 4.8% ($P = .03$), but was not significantly different before and after BAI-specific devices were introduced ($P = .43$). A total of 146 patients (64.6%) underwent operative intervention (91 patients, TEVAR; 55 patients, open repair), with 94% sustaining a grade 3 or 4 injury. Survival in groups 2 and 3 was higher vs group 1 (86.4% vs 73.8%) but was not significant ($P = .38$). Most patients (45 of 47 patients [96%]) in groups 2 and 3 with a minimal aortic injury (MAI) were managed nonoperatively, with no BAI-related deaths. After 2007, follow-up imaging was obtained in 38 patients (80%)