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a multidisciplinary, standardized approach to the identification and management of access site complications in VA-ECMO patients.

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Poster Competition PC058



Staged Endovascular Management of a Symptomatic Complex Pelvic Arteriovenous Malformation With a Multidisciplinary Approach

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Objectives: The patient is a 47-year-old male who was referred for evaluation of a growing symptomatic pelvic mass in the setting of recent non-ST-segment elevation myocardial infarction. Written consent was obtained.

Methods: He originally presented with chest pain at work. On examination, he was found to have a large pulsatile pelvic mass with intermittent left lower abdominal pain for the past 4 years. During cardiac workup, which was ultimately negative, a large left internal iliac arteriovenous malformation (AVM) was identified with multiple arterial connections. A diagnostic angiogram showed a dilated left internal iliac artery and vein with multiple arteriovenous connections. Feeders from the middle sacral, left internal/external iliac, and proximal common femoral arteries draining into the left internal iliac vein with multiple pelvic venous collaterals were seen.

Results: A staged approach to address this complex arteriovenous malformation was created with goals to (1) address the internal iliac artery aneurysm and reduce rupture risk, (2) decrease high-pressure flow through the AVM to offload the heart and reduce IVC dilation, and (3) thrombose his left gluteal aneurysm. First, the arterial inflow was addressed by the vascular surgery team via arterial coiling/plugging of outflow branches through the left internal iliac artery. This was followed by left common to external iliac artery stent grafting to occlude inflow into the left hypogastric artery aneurysm. The next day, he underwent AVM embolization by the interventional radiology team using balloon coil and onyx embolization with iliac vein stenting using a thoracic endograft to occlude the outflow. Two weeks later, he underwent additional embolization to address his left gluteal artery aneurysm. At 5 months, follow-up computed tomography scans showed improvement in the iliac vein size and complete occlusion of the left internal iliac and gluteal artery aneurysms. Echocardiogram showed improvement in cardiac function and decrease in left ventricular/inferior vena cava size.

Conclusions: Arteriovenous malformations are challenging lesions to treat best managed by endovascular interventions. While full resolution may be difficult, the goal of treatment is reduce the malformation's risk to the patient's life. This staged endovascular repair successfully addressed the rupture risk of his arterial aneurysms and eliminate the malformation's high output leading to cardiomyopathy.

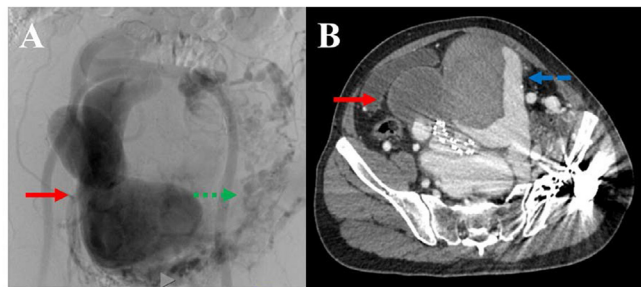


Fig. Image A shows initial angiogram with aneurysmal left internal iliac artery (red arrow) and collateral venous outflow (green dotted arrow). Image B shows post intervention CT scan with thrombosed left internal iliac artery aneurysm (red arrow) and partially thrombosed left internal iliac vein (dashed blue arrow) with flow from low pressure venous collateral.

Author Disclosures: A. V. Ganapathy: Nothing to disclose; S. Hanks: Nothing to disclose; E. Miranda: Nothing to disclose.

IP053



Racing Against the Clock: The Paradox of Early Surgery and Worse Outcomes in Ruptured Abdominal Aortic Aneurysms

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Objectives: Time from symptoms to surgery is a critical factor in surgical care. This study evaluates the impact of symptom-to-incision time on postoperative outcomes in patients undergoing open repair for ruptured abdominal aortic aneurysms (rAAA).

Methods: The Society for Vascular Surgery Vascular Quality Initiative (VQI) registry was studied from 2003 to 2021. Patients undergoing open repair for rAAA were divided into two groups based on the median split of symptom-to-incision time of 7 hours (group I, <7 hours) and group II (≥7 hours). Outcomes were compared between groups, and multivariable logistic regression was used to assess 30-day mortality and return to operating room (RTOR), adjusting for various characteristics.

Results: A total of 2942 patients were selected for analysis, in which group I comprised 1259 patients and group II 1512 patients. Group I had significantly higher rates of in-hospital mortality compared to group II (44.09% [n = 555] vs 39.88% [n = 603]; $P = .018$) and higher RTOR rates (37.81% [n = 476] vs 29.03% [n = 439]; $P < .001$). Rates of dysrhythmia were similar between the groups (23.52% [n = 296] vs 22.92% [n = 346]; $P = .710$), as were rates of congestive heart failure (8.47% [n = 107] vs 7.74% [n = 117]; $P = .481$). Postoperative myocardial infarction rates showed no significant differences: non-ST-segment elevated myocardial infarction (STEMI) occurred in 7.17% (n = 90) of group I and 6.77% (n = 102) of group II, while STEMI occurred in 8.21% (n = 103) of group I and 7.84% (n = 118) of group II ($P = .851$). Group II had higher rates of respiratory complications (8.94% [n = 135] vs 7.59% [n = 96]; $P = .021$) and renal complications (25.02% [n = 378] vs 24.31% [n = 306]; $P = .045$). Stroke incidence was 1.25% across both groups, with ischemic stroke occurring slightly more frequently in group II (1.38% [n = 21] vs 1.08% [n = 14]), while hemorrhagic stroke occurred more frequently in group I (2.24% [n = 28] vs 1.97% [n = 30]; $P = .708$). Multivariable analysis showed that group II had lower odds of 30-day mortality (adjusted odds ratio [aOR], 0.66; 95% confidence interval [CI], 0.54-0.86; $P < .05$) and lower odds of RTOR (aOR, 0.61; 95% CI, 0.54-0.78; $P < .05$) compared to group I.

Conclusions: Patients presenting within 7 hours (group I) had higher mortality and RTOR rates, likely reflecting more severe hemodynamic instability at presentation. In contrast, those presenting after 7 hours (group II) had better outcomes despite longer symptom-to-incision times, possibly due to slower leaks or contained ruptures allowing for pre-operative stabilization. These findings highlight that patient physiology, rather than time alone, is a key determinant of outcomes in ruptured AAA repair.

Author Disclosures: F. Aziz: Nothing to disclose; E. S. Choi: Nothing to disclose; A. Safaya: Nothing to disclose; K. So: Nothing to disclose; A. Zil-E-Ali: Nothing to disclose.

IP107



Predictors of Surgical Site Infection Following Infrainguinal Bypass Surgery

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Objectives: Surgical site infection (SSI) is a common complication following infrainguinal bypass (IIB) in patient with peripheral artery disease (PAD), leading to significant morbidity, including prolonged hospital stays, increased readmission rates, graft failure, and mortality. Despite advances in aseptic techniques, SSI continues to impact patient outcomes, driven by a complex interplay of patient-specific and procedural factors. This study aims to identify predictors of SSI in patients undergoing lower extremity bypass, providing insights into potentially modifiable risk factors.

Methods: We performed a retrospective analysis of all patients undergoing IIB for PAD in the Vascular Quality Initiative database from 2010 to 2024. Patients with concomitant ipsilateral major amputation, suprainguinal bypass, acute leg ischemia, or aneurysmal disease were excluded. Multivariable logistic regression was used to identify risk factors associated with postoperative SSI. Hosmer-Lemeshow goodness-of-fit and area under the curve analyses were employed to assess model fit and accuracy.

Results: Of 59,221 patients undergoing IIB, 1857 (3.1%) developed SSI. Patients with SSI were more likely to be female, obese, and have chronic kidney disease or congestive heart failure (CHF). Urgent procedures, longer operative times, blood transfusions, autogenous grafts, and below-knee bypasses were also more common in the SSI group (Table). Multivariable analysis identified several significant predictors of SSI. Among patient factors, non-US insurance (odds ratio [OR], 2.84; 95% confidence interval [CI], 1.43-5.65; $P = .003$) and obesity (body mass index [BMI] 25-29.9: OR, 1.43; 95% CI, 1.09-1.88; $P = .01$; BMI 29.9-40: OR, 1.64; 95% CI, 1.21-2.21; $P < .001$; BMI ≥ 40 : OR, 2.22; 95% CI, 1.57-3.13; $P < .001$) were associated with an increased risk of SSI. Rest pain (OR, 1.23; 95% CI, 1.01-1.49; $P = .04$) and tissue loss (OR, 1.67; 95% CI, 1.38-2.03; $P < .001$) as a surgical indication also increased the odds of SSI. Comorbidities, including untreated chronic obstructive pulmonary disease (COPD) (OR, 1.21; 95% CI, 1.01-1.44; $P = .04$), severe CHF (OR, 1.89; 95% CI, 1.13-3.14; $P = .01$), diabetes (OR, 1.32; 95% CI, 1.02-1.70; $P = .03$), and kidney failure (OR, 1.83; 95% CI, 1.01-3.33; $P = .046$) were significantly associated with SSI. Perioperative factors such as intraoperative blood transfusion (OR, 2.28; 95% CI, 2.00-2.59; $P < .001$) and prolonged operative time ≥ 150 minutes (OR, 1.51; 95% CI, 1.20-1.89; $P < .001$) and ≥ 300 minutes (OR, 1.95; 95% CI, 1.50-2.54; $P < .001$) increased the risk of SSI. Protective factors included controlling diabetes (OR, 0.75; 95% CI, 0.58-0.97; $P < .03$), controlling hypertension (HTN) (OR, 0.68; 95% CI, 0.54-0.86; $P < .001$), perioperative antibiotics (OR, 0.74; 95% CI, 0.64-0.85; $P < .001$), and prosthetic grafts (OR, 0.85; 95% CI, 0.74-0.99; $P = .03$) (Fig).

Conclusions: This study confirms several risk factors for SSI including obesity, COPD, CHF, diabetes, rest pain or tissue loss presentation, blood transfusion and prolonged operative time. Protective factors, including

Table. Baseline characteristics of patients with and without postoperative surgical site infection (SSI)

Patient characteristics	SSI absent (n = 7364; 96.87%)	SSI present (n = 1857; 3.13%)	P value
Age, median (SD)	67.10 (10.46)	66.55 (10.75)	.0266
Gender			
Male	38,723 (67.51)	1171 (63.09)	<.001
Female	18,638 (32.49)	685 (36.91)	
Race			
White race	43,337 (75.57)	1361 (73.29)	.025
Non-White race	14,011 (24.43)	496 (26.71)	
Ethnicity			
Not Hispanic or Latino	54,206 (94.78)	1731 (93.47)	.013
Hispanic or Latino	2986 (5.22)	121 (6.53)	
Obesity			
Obese	16,732 (29.24)	657 (35.65)	<.001
Nonobese	40,490 (70.76)	1186 (64.35)	
Comorbidities			
Diabetes	30,462 (53.11)	1136 (61.17)	<.001
HTN	51,384 (89.73)	1655 (89.65)	.911
CAD	25,560 (44.58)	841 (45.29)	.543
CHF	11,047 (19.26)	403 (21.70)	.009

(Continued on next column)

Table. Continued.

Patient characteristics	SSI absent (n = 7364; 96.87%)	SSI present (n = 1857; 3.13%)	P value
COPD	15,721 (27.42)	546 (29.40)	.059
Chronic kidney disease	19,354 (33.89)	708 (38.19)	<.001
Dialysis	3274 (5.71)	182 (9.80)	<.001
Anemia	19,361 (33.97)	880 (47.52)	<.001
Preoperative medications			
Aspirin	41,775 (72.85)	1342 (72.27)	.577
Anticoagulant	12,004 (22.19)	433 (24.94)	.007
Beta-blocker	31,873 (55.60)	1085 (58.43)	.016
Statin	44,537 (77.68)	1445 (77.86)	.855
ACE inhibitor	28,713 (53.06)	899 (51.76)	.282
PY12 inhibitors	20,046 (34.96)	660 (35.56)	.595
Nonambulatory	3102 (5.44)	131 (7.10)	.002
ASA class			
I-III	44,341 (77.43)	1340 (72.20)	<.001
IV-V	12,924 (22.57)	516 (27.80)	
Smoking history			
Never	8645 (15.08)	342 (18.42)	<.001
Prior smoker	25,436 (44.36)	805 (43.35)	
Current smoker	23,260 (40.56)	710 (38.23)	
Indication			
Claudication	13,969 (24.35)	251 (13.52)	<.001
Rest pain	15,149 (26.41)	405 (21.81)	
Tissue loss	28,246 (49.24)	1201 (64.67)	
Urgent	10,477 (18.27)	488 (26.28)	<.001
Below knee	43,817 (76.38)	1507 (81.15)	<.001
Graft type			
Autogenous	33,127 (58.01)	1197 (64.63)	<.001
Prosthetic	20,929 (36.65)	530 (28.62)	
Biologic	3049 (5.34)	125 (6.75)	
Procedure time			
<150 minutes	10,504 (18.31)	165 (8.89)	<.001
150-299 minutes	31,553 (55.00)	939 (50.57)	
300+ minutes	15,307 (26.68)	753 (40.55)	
Estimated blood loss			
<500 mL	46,679 (83.57)	1332 (73.03)	<.001
≥ 500 mL	9174 (16.43)	492 (26.97)	
Intraoperative blood transfusion	16,703 (29.35)	971 (53.21)	<.001
Perioperative antibiotics	47,487 (83.06)	1377 (74.39)	<.001

ACE, Angiotensin-converting enzyme; ASA, American Society of Anesthesiologists; CAD, coronary artery disease; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; HTN, hypertension; SD, standard deviation.

perioperative antibiotics, and controlling diabetes and HTN underscore the importance of optimizing perioperative care to reduce SSI risk. These findings highlight opportunities for targeted interventions and personalized risk stratification to improve patient outcomes.

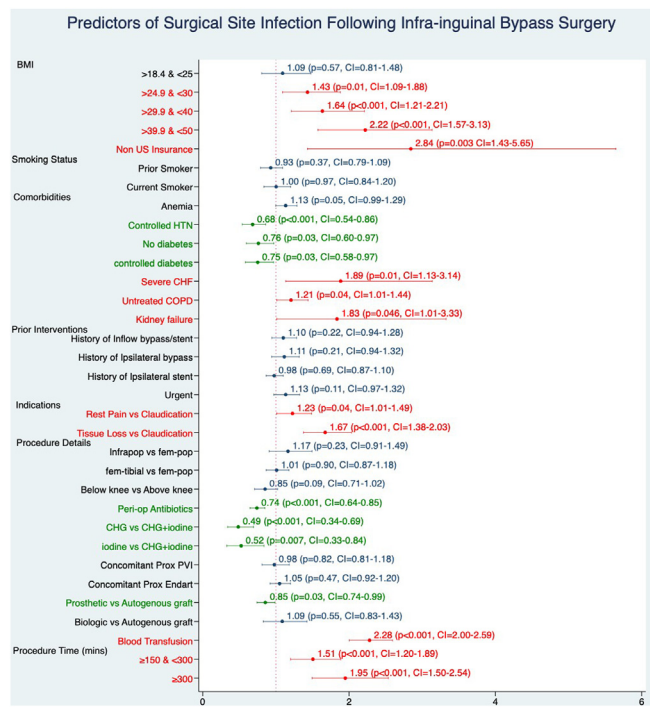


Fig. Predictors of surgical site infection (SSI) following infrainguinal bypass surgery.

Author Disclosures: **M. Hamouda:** Nothing to disclose; **J. Lane:** Nothing to disclose; **M. Malas:** Nothing to disclose; **S. Rahgozar:** Nothing to disclose.

Poster Competition
PC230

**Reintervention Rates and Costs Following
Dialysis Access Placement: Insights from the
Vascular Quality Initiative Database**

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Objectives: Arteriovenous fistula (AVF) and arteriovenous graft (AVG) maintenance require ongoing surveillance and multiple reinterventions, which impose substantial costs on the health care system. This study aimed to investigate the rates of open and endovascular reinterventions and the associated costs following access placement using real-world data.

Table. Reinterventions and total number of balloons and stents per 100 accesses during the follow-up (numbers presented with 95% confidence interval [CI]).

Redo procedure per 100 accesses	All	AVF	AVG	P value
Reintervention (all)	55.72 (52.06-59.64)	53.23 (49.7-56.9)	58.33 (54.04-62.97)	<.001
Reintervention (endovascular)	20.20 (18.11-22.53)	17.03 (15.26-19.02)	23.96 (21.24-27.02)	<.001
Reintervention (open)	32.37 (29.61-35.38)	33.88 (31.03-37.00)	30.92 (27.94-34.22)	.006
Balloon angioplasty	15.39 (13.66-17.35)	13.82 (12.26-15.58)	17.15 (15.01-19.58)	<.001
Stenting	7.20 (5.91-8.77)	4.00 (3.25-4.91)	12.96 (10.52-15.97)	<.001
No. of balloons used	36.48 (31.30-42.52)	31.35 (26.91-36.52)	42.45 (35.71-50.45)	<.001
No. of stents used	8.41 (6.76-10.45)	4.64 (3.71-5.80)	15.23 (12.06-19.23)	<.001

AVF, Arteriovenous fistula; AVG, arteriovenous graft.
Adjusted for demographics, comorbidities, discharge medications, and volume center.

Methods: Using Vascular Quality Initiative data (2019-2024), we analyzed adult patients undergoing upper extremity AVF/AVG placement with at least one follow-up visit. Primary outcomes were reintervention rates per 100 access placements and associated costs. Secondary outcomes included 1-year reintervention, thrombosis, and mortality. We utilized negative binomial regression for reintervention counts and Gamma models for cost analysis, adjusting for demographics and comorbidities. Costs were estimated using relevant CPT codes. One-year outcomes were analyzed using Kaplan-Meier estimates and Cox regression models.

Results: A total of 18,983 accesses were studied (AVG = 4198; 22.1%). The median age of patients in the AVF and AVG cohorts was 63 years (interquartile range [IQR], 52-72 years) and 66 years (IQR, 55-75 years), respectively ($P < .001$). Patients in the AVG cohort were more likely to be female and African American, and to have coronary artery disease and chronic obstructive pulmonary disease. On the other hand, patients in the AVF cohort were more likely to be Hispanic/Latino, obese, and to have PAD. The mean follow-up was 470.6 days. Overall reintervention rates per 100 access placements were higher for AVGs compared to AVFs (58.33 vs 53.23; $P < .001$), driven by endovascular procedures (23.96 vs 17.03; $P < .001$).

Mean costs per reintervention were significantly higher for AVGs compared to AVFs (\$35,500 vs \$29,500; $P < .001$). Total estimated costs per 100 accesses were \$2.07 million for AVGs vs \$1.57 million for AVFs ($P < .001$). At 1 year, AVG was associated with increased hazards of thrombosis (adjusted hazard ratio [aHR], 3.11; 95% confidence interval [CI], 2.70-3.57; $P < .001$), reintervention (aHR, 1.27; 95% CI, 1.05-1.53; $P = .014$), and mortality (aHR, 1.46; 95% CI, 1.41-1.86; $P = .002$) compared to AVF (Fig).

Conclusions: Compared to AVFs, AVGs have higher reintervention rates and associated costs, as well as worse 1-year outcomes. These findings underscore the importance of cost-conscious access planning. Further studies should evaluate the most cost-effective reinterventions for access maintenance.

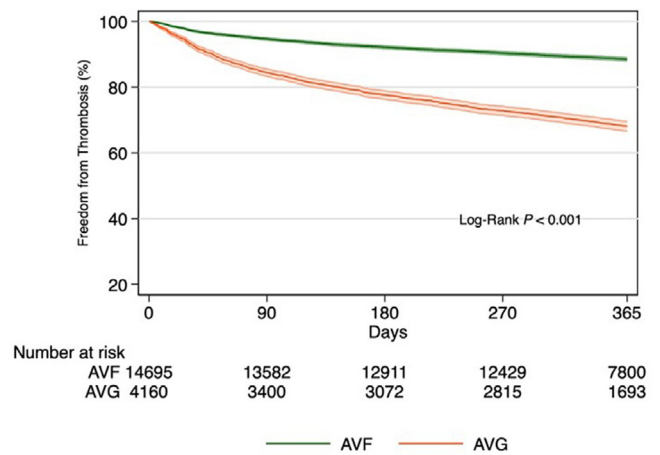


Fig. One-year freedom from thrombosis stratified by access type.

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