#1 - COMPARISON OF SINGLE- AND TWO-VESSEL MESENTERIC ARTERY STENTING FOR CHRONIC MESENTERIC ISCHEMIA

Rafael D Malgor, MD , Gustavo S Oderich, MD , Joseph J Ricotta, MD , Audra A Duncan, MD , Stephen Cha, MS , Janet Hofer, RN , Manju Kalra, MBBS , Thomas C Bower, MD , Peter Gloviczki, MD

Mayo Clinic (Rochester), Rochester, MN US

Purpose: To compare the outcomes of single- and two-vessel mesenteric artery stenting in patients with chronic mesenteric ischemia (CMI).

Methods: We reviewed 91 patients (32 males and 59 females, mean age 72±13 years) treated with mesenteric artery stenting for atherosclerotic CMI between 1998 and 2008. Clinical data and outcomes were compared in patients treated with single-vessel superior mesenteric artery (SMA) stent (Group A) or two-vessel celiac and SMA stent (Group B). End-points were differences in morbidity and mortality and freedom from recurrent symptoms and re-interventions.

Results: There were 56 patients in Group A and 22 in Group B. Both groups had similar demographics, cardiovascular risk factors and clinical presentation. Early mortality (2% and 4%), morbidity (18% and 26%) and symptom relieve (95% and 78%) were similar in Group A and B, respectively (P=NS). Mean follow up was 14±17 months. Freedom from recurrent symptoms and re-interventions at 2-years were 77% and 70% for Group A and 74% and 71% for Group B (P=NS). Primary and secondary patency rates at 2-years were 76% and 80% for SMA, and 69% and 100% for celiac stents (P=NS). Celiac stent alone was required in 13 patients because of inability to treat the SMA. All patients had symptom improvement, but 5 (39%) developed recurrence.

Conclusion: Two-vessel celiac and SMA stenting does not reduce the incidence of recurrent symptoms and the need for re-interventions when compared to single-vessel SMA stenting in patients with CMI. Celiac stent alone carries a high risk of recurrence.

#2 - CHANGES IN LEFT VENTRICULAR STRUCTURE AND FUNCTION FOLLOWING RENAL ARTERY REVASCULARIZATION

Matthew A Corriere, MD, MS , John R Hoyle, MD, MPH , Matthew S Edwards, MD , Timothy E Craven, MSPH , Ralph B D'Agostino, Jr., PhD , Darryl D Prime, MD , Kimberley J Hansen, MD

Wake Forest University School of Medicine, Winston-Salem, NC US

Background: Renovascular disease (RVD) is associated with left ventricular hypertrophy (LVH) and left ventricular diastolic dysfunction, both of which are associated with increased mortality and cardiovascular events. However, the effects of renal artery revascularization on cardiac morphology and function are poorly understood and largely based upon retrospective studies. In order to characterize changes in ventricular function and morphology following renal artery revascularization, we identified a cohort of patients with baseline preoperative echocardiograms and studied them with repeat echocardiography at 6-12 months post-revascularization.

Methods: Adult patients undergoing preoperative echocardiography and renal revascularization later than March, 2007 were identified from an operative registry and recruited to return for repeat echocardiography, blood pressure measurement, and collection of interval clinical and medication history between 6 and 12 months following renal revascularization. Repeat echocardiograms were performed and interpreted according to American Society of Echocardiography recommendations for clinical trials of heart failure and other published guidelines. Systolic function was assessed as ejection fraction (EF) calculated using the modified Simpson's method. Diastolic function was categorized as normal, mild dysfunction, moderate dysfunction, or severe dysfunction based on published guidelines. Significance of longitudinal changes in continuous echocardiogram measures was assessed using paired T-tests, while longitudinal changes in categorical measures were assessed using McNemar's test.

Results: 20 patients were recruited for postoperative echocardiography at a median of 7.6 months following renal artery revascularization. Mean changes in echo parameters of ventricular morphology, ejection fraction, and diastolic function are displayed in Table 1. Accounting for variance and pre/post correlation, power to detect a ≥ 20% change in echo parameters assessed in a continuous fashion was >80% for all measures. Mean decreases in left ventricular mass (P=0.047) and left ventricular mass index (P=0.018) were observed. No significant change in EF was detected. Categorical group-wise change in DD assessed as a dichotomized outcome (normal/mild versus moderate/severe) was non-significant (P=0.0833), with two patients progressing from normal/mild to moderate/severe DD during follow-up and the remainder categorically unchanged.

Conclusion: Interval decreases in left ventricular mass and left ventricular mass index were observed following renal artery revascularization, while diastolic function was largely unchanged. Regression of LVH has been associated with reduced mortality due to sudden cardiovascular death, and further investigation is required to understand the long term effects of renal revascularization on survival and ventricular function.

Table I. Changes in echo parameters of systolic and diastolic function at 6-12 months following renal revascularization. Median time from renal artery revascularization to follow-up echo was 7.6 months.

Parameter	Preoperative	Postoperative	95% CI
Ventricular Hypertrophy			
LV mass (g)	253.45 ± 91.70	190.25 ± 92	(-105.4, -0.77)
LVMI (g/m2)	135 ± 36	99 ± 33	(-63.7, -7.6)
Systolic function			
EF (%)	61.3 ± 8.5	62.3 ± 12.2	(-4.3, 6.3)
Diastolic function			
E/A	1.02 ± 0.42	1.14 ± 0.66	(-0.21, 0.45)
E/e'	12.96 ± 4.69	13.92 ± 5.73	(-0.61, 2.53)
DT (ms)	358 ± 137	283 ± 115	(-132, -17)

#3 - INCIDENCE OF SURGICAL SITE INFECTIONS AFTER LOWER EXTREMITY BYPASS WITHIN THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM

Kristina A Giles, M.D. , Allen D Hamdan, M.D. , Frank B Pomposelli, M.D. , Mark Wyers, M.D. , Marc L Schermerhorn, M.D.

Beth Israel Deaconess Medical Center, Boston, MA US

OBJECTIVES:
Patients undergoing lower extremity bypass are at high risk for surgical site infections (SSI). We examine lower extremity bypasses by bypass origin to analyze differences in postoperative mortality and SSI occurrence.

METHODS:
The 2005-2006 National Surgical Quality Improvement Program (NSQIP), a multi-institutional risk-adjusted database, was queried to compare perioperative mortality (in-hospital or 30-day) and postoperative SSIs after lower extremity arterial bypass for peripheral arterial disease. Bypass was stratified by graft origin as aorto-iliac, femoral, or popliteal. Patient demographics, comorbidities, operative, and post-operative occurrences were analyzed.

RESULTS:
There were 2,638 bypasses performed (438 aorto-iliac, 2,002 femoral, and 198 popliteal origin). Mortality was similar regardless of bypass origin (1.6%, 2.8%, & 1.5%, P=.62). Surgical site infections occurred in 11.4% of overall cases (10.3%, 11.7%, & 10.6%, P=.68). Patients with preoperative wound infections were more likely to be diagnosed with a SSI (RR 1.3, 95%CI 1.1-1.5, P<.01). Incidence of graft failure was significantly associated with postoperative SSI occurrence (RR 2.1, 95%CI 1.5-3.0, P<.001). Independent predictors of mortality were age, congestive heart failure, poor preoperative functional status, body mass index <18.5kg/m2, and preoperative creatinine >1.8mg/dL or albumin <4g/dL. Independent predictors of SSI were admission indication of gangrene or rest pain, obesity (BMI >30kg/m2), and preoperative white blood cell count >10,000.

CONCLUSIONS:
Surgical site infections occur frequently after lower extremity bypass regardless of bypass origin and are associated with early graft failure. Those patients with increased risk of wound infection or death may be better treated with a minimally invasive endovascular technique when feasible.

Multivariate Predictors of Mortality After Lower Extremity Bypass

	OR	95% CI	P-Value
Age (vs <40 years)			
40-49 years	1.58	0.52-4.82	.42
50-59 years	3.22	1.24-8.35	<.05
60-69 years	2.37	0.88-6.39	.09
70-79 years	2.95	1.11-7.85	<.05
80-89 years	3.28	1.21-8.90	<.05
≥90 years	5.23	1.79-15.33	<.01
Comorbidities			
Congestive Heart Failure	3.95	1.81-8.63	<.01
Poor Preoperative Functional Status	2.20	1.28-3.79	<.01
Underweight: Body Mass Index <18.6 kg/m²	4.81	2.34-9.91	<.001
Preoperative Laboratory Values			
Creatinine > 1.8 mg/dL	2.28	1.34-3.89	<.01
Albumin < 4.0 g/dL	1.89	1.12-3.19	<.05

Multivariate Predictors of Surgical Site Infection After Lower Extremity Bypass

	OR	95% CI	P-Value
Obesity: Body Mass Index >30 kg/m²	2.23	1.64-3.04	<.001
Admission Indication (vs Claudication or Ulcer)			
Rest Pain	1.48	1.01-2.17	<.05
Gangrene	1.75	1.22-2.52	<.01
Preoperative Laboratory Values			
WBC > 10,000	1.51	1.09-2.08	<.05

#4 - IMPLICATIONS OF IN SITU THROMBOSIS AND DISTAL EMBOLIZATION DURING SUPERFICIAL FEMORAL ARTERY ENDOLUMINAL INTERVENTION.

Jean Bismuth, MD , Joseph J Naoum, MD , Imran T Mouhiddin, MD , Eric K Peden, MD , Alan B Lumsden, MD

The Methodist Hospital, Houston, TX US

Background: Endoluminal therapy for superficial femoral artery (SFA) occlusive disease is commonplace, but the incidence and outcomes of in situ thrombosis and distal embolization have not been well defined. The aim of this study is to examine the impact of in situ thrombosis and distal embolization on long-term outcomes of SFA interventions.

Methods: A database of patients undergoing endovascular treatment of the SFA between 1986 and 2008 was queried. Patients who developed either in situ thrombosis (treated by pharmaco-mechanical lytic therapy) or distal embolization were selected. Kaplan-Meier survival analyses were performed to assess time-dependent outcomes. Factor analyses were performed using a Cox proportional hazard model for time dependent variables.

Results: 818 limbs underwent endovascular treatment for symptomatic SFA disease. Overall the rate was 7.3% with 3.5% suffering in situ thrombosis (all treated with lytic therapy) and 3.8% suffering distal embolization (68% treated percutaneously and remainder treated by embolectomy). Females were more likely to experience either event. Distal embolization resulted in significantly lower limb salvage and freedom from recurrent symptoms (Table) while in situ thrombosis treated with lytic therapy was associated with lower patency (Table). There was no difference in outcomes whether surgical or percutaneous therapy was used to treat the distal embolization. While preoperative tibial runoff did not influence limb loss after distal embolization, it was a significantly associated with decreased patency after in situ thrombosis.

Conclusions: Distal embolization during SFA interventions is associated with limb loss independent of preoperative runoff and subsequent intervention while the use pharmaco-mechanical lytic therapy for in situ thrombosis is associated with loss of patency but equivalent limb salvage and freedom from recurrent symptoms.

Table	No Thr Distal E
Number Limbs at Risk	
Gender (% male)	
Rest Pain / Tissue Loss	
TASC C/D Lesions	
Primary Stenting	
Freedom from Recurrent Symptoms (%)	
Limb Salvage (%)	
Primary SFA Patency (%)	
Assisted Primary SFA Patency (%)	
Secondary SFA Patency (%)	

Mean±SEM at 2 years follow up; † compared to In Situ Th
* p<0.05, ** p<0.01 compared to No Thrombosis or Distal

#5 - NATIONAL OUTCOMES AFTER OPEN REPAIR OF ABDOMINAL AORTIC ANEURYSMS WITH VISCERAL OR RENAL BYPASS

Michelle C Martin, MD , Kristina A Giles, MD , Frank Pomposelli, MD , Allen D Hamdan, MD , Mark C Wyers , MD , Marc L Schermerhorn, MD

Harvard Institute of Medicine, Boston, MA US
Beth Israel Deaconess Medical Center; Boston, MA US

Objective
To evaluate national outcomes after open repair of abdominal aortic aneurysms with visceral or renal bypass (VRB).
Methods
Using the NIS database from 1993-2005, AAA repairs were identified by ICD9 codes for diagnosis of intact AAA combined with a procedure of open AAA repair. VRB patients also had an aorto-renal and/or mesenteric bypass, or mesenteric endarterectomy. Dissections, thoracic, and thoracoabdominal aneurysms were excluded. Demographics and comorbidities were noted. Mortality and complications were compared to infrarenal AAA repairs without visceral or renal bypass (IRA). Predictors of perioperative mortality were analyzed by multivariate logistic regression.
Results
A total of 39,734 VRB and 349,806 IRA repairs were identified. VRB repairs had a 57.14% volume decrease (IRA 52.8% volume decrease). Mortality and complications including acute renal failure, acute mesenteric ischemia, and bowel resection were higher after VRB.(Table) Acute myocardial infarction was similar between cohorts. Patients requiring a bowel operation or with a complication of acute renal failure were 10 times more likely to die within the hospital stay. Independent preoperative predictors of mortality were age, chronic renal failure, congestive heart failure, and pulmonary disease. Postoperative complications were predictive of mortality as well.
Conclusion

VRB repair volume decreased per year similarly to open IRA repair volume and may be related to the advances of endovascular therapy. Mortality after VRB is high and dependent upon age, renal failure, acute mesenteric insufficiency and bowel surgery. Recommendations include avoiding concomitant bypass and consideration of visceral / renal stenting.

Mortality after Open Abdominal Aortic Aneurysm Repair With and Without Visceral/Renal Bypass

	VRB	IRA	P-value
Overall	5.8%	4.4%	<.001
Age: <55	1.7%	1.5%	.84
55-59	1.9%	1.5%	.52
60-64	3.4%	1.9%	<.01
65-69	4.4%	2.6%	<.001
70-74	4.9%	4.0%	.08
75-79	7.6%	5.5%	<.001
80+	11.3%	9.1%	<.05
Male	5.3%	3.9%	<.001
Female	8.0%	6.2%	<.01

Complications after Open Abdominal Aortic Aneurysm Repair With and Without Visceral/Renal Bypass

Acute Renal Failure	9.2%	5.8%	<.001
Acute Mesenteric Ischemia	2.0%	1.1%	<.001
Bowel Resection	1.1%	0.8%	<.01
Acute Myocardial Infarction	2.6%	3.0%	.06

Predictors of Mortality After Open Abdominal Aortic Aneurysm Repair With and Without Visceral/Renal Bypass

	OR	95% CI	P Value
Visceral / Renal Bypass + AAA Repair	1.3	1.2-1.5	<.001
Age (per year)	1.1	1.1-1.1	<.001
Female Gender	1.6	1.5-1.7	<.001
Comorbidities			
Chronic Renal Failure	6.4	5.6-7.3	<.001
Congestive Heart Failure	7.5	6.0-9.2	<.001
Chronic Pulmonary Disease	1.2	1.1-1.3	<.001
Hypertension	0.4	0.3-0.4	<.001

Complications as Predictors of Mortality After Open *Abdominal Aortic Aneurysm Repair With and Without Visceral/Renal Bypass (adjusted for age, gender, and repair type)*

Acute Renal Failure	10.2	9.4-11.2	<.001
Bowel Operation	9.7	7.9-12.6	<.001
Acute Myocardial Infarction	6.1	5.3- 7.0	<.001

Table: Mortality and Complications after Open Abdominal Aortic Aneurysm Repair with and without Visceral/Renal Bypass

#6 - LONG-TERM RESULTS OF EVERSION CAROTID ENDARTERECTOMY

James H Black, III, MD , Joseph Ricotta, MD , Calvin E Jones, MD

Johns Hopkins Hospital, Baltimore, MD US

Objective: Carotid endarterectomy (CEA) is supported by Level 1 evidence as the standard of care for symptomatic and asymptomatic extracranial carotid stenosis. Carotid eversion endarterectomy (ECEA) has been proposed as an acceptable alternative to the standard bifurcation endarterectomy in many patients; however, long term follow-up of this technique has not been reported. This study was designed to analyze the long-term durability of ECEA in symptomatic and asymptomatic patients.

Methods: From June, 1989 to March, 2002, 534 ECEAs were performed on 485 patients (60% male, 44% symptomatic, reoperative 1.0%). Preoperative characteristics, operative findings, and postoperative duplex data were entered prospectively into database. This data was retrospectively reviewed to determine the incidence of major adverse cardiovascular events within 30 days of surgery (MACE), late survival and the late incidence of ipsilateral carotid disease. Variables associated with carotid restenosis were subjected to statistical analysis.

Results: The mean follow-up period was 8.86 years (95% CI, 6.56-9.16; median 8.6y). MACE occurred in 19 patients (3.8%), including 13 strokes (2.6%) and 6 deaths (1.2%). MACE when added to surgical site related complications yielded a <30 day complication rate of 5.3%. Survival by life-table analysis at 5 and 10 years was 75.2% and 50.1%, respectively. Recurrent stenosis of the ECEA site was noted in 20 patients (4.1%) with a mean time to recurrence of 4.4 years (95% CI, 2.92-6.07; median 4.0y). Statistical analyses failed to implicate any specific patient risk factor, symptomatic presentation, presence of hyperlipidemia or statin use, ICA diameter, or presence of residual disease as predictive of recurrent stenosis.

Conclusions: The current study represents the longest follow-up to date of patients undergoing ECEA. The findings of this study support eversion carotid endarterectomy as a safe and durable long-term treatment for extracranial carotid disease presenting with and without acute symptomatology.

#7 - AUTOGENOUS BASILIC VEIN TRANSPOSITION FOR HEMODIALYSIS; A LARGE SCALE STUDY OF EFFICACY AND OUTCOME.

Carolyn H Glass, MD , Karl A Illig, MD , John A Porter, MD , Kate Young, PhD

University of Rochester, Rochester, NY US

BACKGROUND: The Dialysis Outcomes Quality Initiative (DOQI) has led to an increase in autogenous fistulas at our institution. In patients with unsuitable distal vessels, transposition fistulas are often the choice for hemodialysis vascular access. In this large scale study we report our experience with autogenous brachial-basilic upper arm transpositions (BTX). METHODS: Patients undergoing autogenous BTX for hemodialysis access between April 2001 and June 2008 were retrospectively reviewed. Data collected included demographics, type of anesthesia, flow at creation, maturation rate, patency rates, post-op complications, secondary interventions, and medical co-morbidities. RESULTS: Two hundred fifteen patients, 53% male, mean age 58.4 years underwent 217 BTX fistulas. The maturation rate was 87% with a mean flow of 347 ml/min at creation. Primary and primary assisted patency rates were 63%, 40%, 26% and 74%, 56%, 38% at 6, 12 and 24 months respectively. Secondary patency rates at 6, 12 and 24 months were 85%, 72% and 65% respectively. Mean follow-up was 9.0 months (range, 0 to 58 months). The most common causes of failure were central venous outflow stenosis (22%), thrombosis of AVF (16%) and stenosis within the body of the AVF (9%). Post-operative interventions included angioplasty of the proximal outflow vein (7%), angioplasty of the AVF (6%), hematoma evacuation (5%), debridement (4%) and DRIL procedure (3%). Co-morbid diabetes and hypercoagulable state were both significantly associated with a primary failure rate, $p<0.04$ and $p<0.003$ respectively. CONCLUSIONS: To date, this is the largest series for basilic transpositions reported. In our center's experience, autogenous BTX fistulas have excellent initial maturation rates (87%), with higher than expected patency rates compared to previous studies, 72% secondary patency at 1 year. However, central venous stenosis is a major limiting factor in long term durability, and several post-surgical interventions are necessary to maintain patency. Attention should be given to improving secondary endovascular techniques to provide long term access.

#8 - VARIATIONS IN EARLY OUTCOMES OF ENDOVASCULAR ANEURYSM REPAIR WITH ALTERNATE ENDOGRAFT CONFIGURATIONS

Shane O'Keeffe, MD , Eric D Endean, MD , Davenport Dan, Ph.D. , Eleftherios S Xenos, MD , Nick N Abedi, MD , Ehab E Sorial, MD , David J Minion, MD

University of Kentucky Med. Ctr., Lexington, KY US

Objective: Endovascular aneurysm repair (EVAR) has been shown to result in favorable early outcomes compared to standard repair of abdominal aortic aneurysms (AAA). Most EVAR performed in the U.S. involve a modular configuration. The purpose of this study is to examine the effect of alternate graft configurations on early outcomes during EVAR.

Methods: Patients in the National Surgical Quality Improvement Program (NSQIP) participant use file who underwent EVAR for AAA from 2005-2007 were stratified by configuration using CPT codes. Configurations compared included Tube (34800), Modular (34802, 34803), Unibody (34805), and Aorto-uni (34805). Preoperative risk factors, intra-operative variables were tabulated. Emergent cases were excluded in the analysis of 30-day outcome measures and length of stay. Composite morbidity included patients experiencing one or more of 21 complications defined by NSQIP protocol. T-tests and analyses of variance (ANOVA) were used to compare variables.

Results: 3,662 patients underwent EVAR including 360 Tube, 2918 Modular, 218 Unibody, and 166 Aorto-uni configuraftions (Table). A proportionately higher percentage of Tube and Aorto-uni configurations were used for both emergent cases and in female patients. For elective cases, the use of Aorto-uni and Tube configurations was associated with a greater composite morbidity and length of stay. After controlling for the top 11 National NSQIP predictors of mortality in vascular patients, graft configuration remained significant in the multivariable analysis for morbidity and length of stay, but not mortality.

Conclusions: EVAR using a Tube or Aorto-uni configuration is associated with increased complications and length of stay. These poorer outcomes may be related to anatomic factors that lead surgeons to choose these approaches.

	Tube	Modular	Unibody	Aorto-uni	P value
Total (n)	360	2918	218	166	
Emergent	11.1%	3.6%	2.8%	12.7%	<0.01
Female	25.3%	16.4%	14.2%	28.3%	<0.01
For elective cases:					
30-day Mortality	2.2%	1.2%	1.9%	1.4%	0.42
30-day Composite Morbidity	14.1%	9.6%	9.0%	19.3%	<0.01
Length of Stay	4.9 days	3.4 days	3.1 days	5.5 days	<0.01

Table

#9 - EXPERIENCE AND TECHNIQUE FOR THE ENDOVASCULAR MANAGEMENT OF IATROGENIC SUBCLAVIAN ARTERY INJURY

Neal S Cayne, MD , Todd L Berland, MD , Caron Rockman, MD , Thomas Maldonado, MD , Mark A Adelman, MD , Patrick J Lamparello, MD , Frank Veith, MD

, New York, NY US

New York University; New York City, NY US

OBJECTIVES: Inadvertent subclavian artery catheterization during attempted central venous access is a well known complication. Historically, these patients are managed with an open operative approach and repair under direct vision via an infraclavicular and/or supraclavicular incision. We describe our experience and technique for endovascular management of these injuries.

METHODS: Twenty patients were identified with inadvertent iatrogenic subclavian artery cannulation. All cases were managed via an endovascular technique under local anesthesia. After correcting any coagulopathy, a 4 French glide catheter was percutaneously inserted into the ipsilateral brachial artery and placed in the proximal subclavian artery. Following an arteriogram and localization of the subclavian arterial insertion site, the subclavian catheter was removed and bimanual compression was performed on both sides of the clavicle around the puncture site for 20 minutes. A second angiogram was performed, and if there was any extravasation, pressure was held for an additional 20 minutes. If hemostasis was still not obtained, a stent graft was placed via the brachial access site to repair the arterial defect and control the bleeding.

RESULTS: Two of the 20 patients required a stent graft for continued bleeding after compression. Both patients were well excluded after endovascular graft placement. Hemostasis was successfully obtained with bimanual compression over the puncture site in the remaining 18 patients. There were no resultant complications at either the subclavian or brachial puncture sites.

CONCLUSIONS: This minimally invasive endovascular approach to iatrogenic subclavian artery injury is a safe alternative to blind removal with manual compression or direct open repair.

#10 - SURGICAL REPAIR OF CAROTID ARTERY ANEURYSMS: A 10-YEAR, SINGLE CENTER EXPERIENCE

Sunita D Srivastava, MD , Matthew J Eagleton, MD , Patrick O'Hara, MD , Vikram Kashyap, MD , Timur Sarac, MD , Daniel Clair, MD

The Cleveland Clinic Foundation, Cleveland, OH US

Purpose: The aim of this study was to evaluate the surgical management of carotid artery aneurysms (CAA) presenting to a tertiary care center over a ten year period of time.

Methods: The medical records of patients undergoing CAA repair between 1998 and 2008 were reviewed. Demographics, clinical presentation, and operative interventions were recorded. Post-operative outcomes were assessed, and patency and survival rates were calculated using life-table analysis.

Results: Demographics and comorbidities of 19 patients undergoing CAA repair are listed in Table. Two patients (11%) had a history of neck dissection, 1 (5%) neck irradiation, and 3 (16%) a combination of neck dissection and irradiation for cancer. Five (26%) had previous carotid endarterectomy, while 3 (16%) had prior carotid artery stenting for occlusive disease. Eight (42%) patients presented with neurologic symptoms, all transient in nature. Aneurysms were isolated to the internal carotid artery in 8 (42%) cases, the common carotid artery in 1 (5%) case, and both regions in the remaining 53%. The etiology of the aneurysms were divided among atherosclerotic aneurysms (36.8%), mycotic pseudoaneursyms (36.8%) and patch aneurysms (26.3%).Twelve (63%) underwent resection and interposition grafting, 6 (32%) underwent aneurysm resection and patch repair, and 1 (5%) had resection with end-to-end reconstruction. Post-operative complications included 1 TIA (5%), 2 strokes (10%), and 1 cranial nerve deficit (5%). Primary patency and survival at 5 years was 73% (SE=0.030) and 92% (SE=0.37), respectively. Assistend primary patency increased to 90% at five years (SE=0.37).

Conclusions: CAA surgery, while rare, can be performed safely and with durable patency. Future studies will be necessary to assess the efficacy of endovascular therapy on this disease.

Table. Patient Demographics and Co-morbidities	
Age (mean)	68±3.1 years (33-87)
Males	15 (79%)
Hypercholesterolemia	9 (47%)
Hypertension	16 (84%)
Diabetes	1 (5%)
Coronary Artery Disease	7 (37%)
Peripheral Arterial Disease	3 (16%)
Other aneurysms	5 (26%)

Table

#11 - AN ANALYSIS OF PATIENTS PRESENTING WITH SYMPTOMATIC CAROTID STENOSIS: IS OUTCOME RELATED TO INDICATION OR TIMING OF INTERVENTION

R Clement Darling III , MD , Philip SK Paty, MD , Sean P Roddy, MD , John B Taggert, MD , Benjamin B Chang, MD , Paul B Kreienberg, MD , Kathleen J Ozsvath, MD , Manish Mehta, MD, MPH , Yaron Sternbach, MD , Dhiraj M Shah, MD

Albany Medical College, Albany, NY

Purpose: Timing of intervention after neurologic symptoms referable to the carotid bifurcation has classically been based more on surgeon and referring neurologist preference rather than scientific fact. In this study, we examine our results in patients who have symptomatic carotid endarterectomy (CEA) and stratify them by timing of endarterectomy in relation to onset of their last symptom.
Methods: All patients treated with CEA at our institution for symptomatic disease were reviewed from 1982-2007. Symptoms were grouped into amaurosis fugax, transient ischemic attack (TIA), and stroke. Outcomes were analyzed in relation to timing of intervention after the last reported symptom. Thirty day peri-operative morbidity and mortality as well as stroke-mortality were recorded based on timing of surgery in relation to indication. (Less than 1 week, weekly till week 4 and after 4 weeks).
Results: In this time period, symptomatic CEA was performed in 1597 patients. There were 17 deaths for an operative mortality of 1.06% and 24 strokes for a stroke rate of 1.5%. When stratified by indication, stroke-mortality rates were significantly lower for non-stroke patients (those presenting with TIA and amaurosis fugax) compared to those presenting with acute stroke as an indication for operation (1.45%vs 3.0% p< 0.05) There was no difference in stroke or death for non-stroke patients regardless of time interval (p=ns). In patients undergoing CEA less than one week after acute stroke, there was a 4.82% stroke rate (8/166). However, in each of the ensuing four weeks and those patients operated on greater than four weeks, the stroke rate was not significantly different (1.68%, 1.33%, 3.85%, 0.34%, respectively). There was no difference in operative mortality in any interval.
Conclusion: Carotid endarterectomy for symptomatic disease can be performed safely with low mortality, stroke, and stroke mortality rates. Those patients presenting with non-stroke symptoms have low stroke rates at any treatment interval. Patients presenting with acute stroke have a significantly higher peri-operative stroke rate in the first week but not thereafter.

#12 - QUALITY OF TIME SPEND WITHOUT THE CERBRO-VASCULAR SYMPTOMS (Q-TWIST) AFTER HIGH-RISK CAROTID INTERVENTION; 5-YEAR PROSPECTIVE COMPARISON OF STENTING, ENDARTERECTOMY AND BEST MEDICAL TREATMENT IN A TERTIARY REFERRAL CENTRE.

Niamh Hynes, MD MRCSI , Sherif Sultan, MD FRCSI EBQS_Vasc

Western Vascular Institute, Galway, Intl. IR

Although CAS showed initial promise in high-risk patients, recent trials cast doubt on safety and efficacy. We aim to conciliate CAS with CEA and BMT in high-risk patients. Primary-endpoints were stroke, myocardial infarction or death. Secondary-endpoints were cost-effectiveness and re-intervention rate.

From 2002-2007, of 712 carotid patients, 300 were high-risk, symptomatic with low GSM on pre-operative duplex. CEA (n=228), CAS (n=34) or BMT (38). 19 (6.3%) had bilateral interventions. All had CT brain and BMT. Propensity scoring adjusted for confounding factors.

Mean age was similar between CEA, 68.6years; and CAS, 70.6years, p>0.05. BMT patients were significantly older (75years) than CEA (p<0.01) or CAS (P<0.05). Male-to-female ratio was 2:1 (CEA, CAS) and 1:1 (BMT). Co-morbidity severity scores were similar between groups (p>0.05).

CEA 30-day stroke-free survival was 99.1% (95%CI=99.6-99.9%) Four CAS patients required on-table tPA. Three recovered fully by procedure end. The fourth, 84 year-old lady had hyper-perfusion syndrome. Mean HDU-stay reduced with CAS vs CEA (1.9+/-0.3days vs. 0.2+/-0.1days, p=0.025).Mean total-stay was similar CEA (9.4+/-0.5 days) vs.CAS (7.2+/-1.1 days) p=0.130.

5-year primary-patency was 94.6% (95%CI=90.5%-97.0%). 5-year stroke-free survival improved significantly with CEA (90.6%) compared to BMT (44.3%, p<0.0001, h=0.22, [95%CI=0.08-0.61]) but not to CAS (84.3%, p=0.581, h=0.73, 95%CI=0.22 to 2.44]).

Q-TWiST and cost-per-QALY were similar between CEA and CAS (P>0.05) but significantly improved with CEA compared to BMT (P<0.0001 and P<0.001).

Skilled CAS-patient selection excludes patients with echolucent plaques and heavy atherosclerotic aortic-arch burden.High-risk BMT patients have fivefold risk of stroke or death at five years. CEA remains the gold standard.

#13 - THORACIC ENDOVASCULAR AORTIC REPAIR (TEVAR) FOR AORTIC DISSECTION: USE WITH CAUTION!

Houssam K. Younes, MD , Kristofer M. Charlton-ouw, MD , Jean Bismuth, MD , Joseph Naoum, MD , Mark G. Davies, MD,PhD,MBA , Alan B. Lumsden, MD , Eric K. Peden, MD

Department of cardiovascular surgery, DeBakey Heart and Vascular Institute, The Methodist Hospital, Houston, TX US
Department of cardiovascular surgery, DeBakey Heart and Vascular Institute, The Methodist Hospital; houston, TX US

Objective: Aortic dissection is a lethal disease and as a result TEVAR has emerged as an acceptable off label treatment modality. We report our experience in the treatment of this disease with an emphasis on defining the patterns of morbidity.

Methods: We retrospectively reviewed all (n=90) the patients with thoracic aortic disease who received a TEVAR between February 2005 and December 2007. Aortic dissection was the indication in 23 (26%) patients (48% acute, 52% chronic; Stanford A 22%, Stanford B 78%). 57% of the patients were symptomatic on presentation, 30% of cases were performed emergently and 30% of the cases required debranching to improve landing zones.

Results: Technical success was achieved in 96% of cases with average operative time of 188+114 minutes. Post operative complications included respiratory failure 14%, acute renal failure 14%, gastrointestinal (GI) symptoms in 18% and cerebrovascular symptoms in 5%. Cerebrospinal fluid drain was used in 36% of case, still transient spinal cord ischemia (SCI) was observed in 9%. In hospital mortality rate was 14%. Average length of stay was 11+ 8 days; 65% of patients were discharged home, 10% required rehabilitation and 25% were discharged to skilled nursing facility. Post operative Renal and GI complication were observed more frequently in acute dissections; however, chronic dissections required relatively longer operative time and were associated with SCI. On the other hand, while renal failure was observed commonly with type A dissection, GI symptoms were observed with type B (TABLE).

Conclusion: Aortic dissection remains a challenging clinical identity and the advent of TEVAR while improving outcomes still carries considerable morbidity with distinct patterns between mode of presentation and anatomic extent.

TABLE:

Variable	Acute (N=11)	Chronic (N=12)	Stanford A (N=5)	Stanford B (N=18)
Intraoperative				
Operation Time	129±43 min	236±133 min	208±116	161±84
Average # of devices	1.4	1.8	2.2	1.2
Technical Success	100%	92%	100%	94%
Post Operative Complications				
Pulmonary	27%	25%	40%	22%
Acute renal failure	27%	8%	40%	11%
Gastrointestinal tract	27%	8%	0%	22%
Cerebrovascular accident	9%	0%	0%	5%
Spinal cord ischemia (transient)	0%	17%	20%	6%
Mortality	18%	8%	20%	11%
Length of Stay	13±10 days	13±9 days	14±9	10±8

#14 - DIRECTIONAL ATHERECTOMY IS SUPERIOR TO PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY (PTA) FOR THE ENDOVASCULAR TREATMENT OF COMPLEX TIBIAL LESIONS

Habib Khan, MD , Ashley Graham, , Lee Goldstein, MD , Elliot Sambol, MD , Combiz Rezayat, MD , Nicholas Morrissey, MD , K. Craig Kent, MD , James McKinsey, MD

New York Presbyterian Hospital, New York, NY US

Objective(s): The main stay of endovascular tibial intervention has been PTA. Directional atherectomy was introduced as an alternative to PTA. We wish to compare the two modalities for patency and limb salvage with similar lesions based on TASC classification.

Methods: A prospective database was maintained including all patients undergoing endovascular lower extremity intervention from 2004 -2008. All tibial lesions were classified based on the TASC classification and the primary, secondary and limb salvage rates were calculated. Noninvasive laboratory testing was performed at regular intervals in the postoperative period.

Results: 412 tibial lesions in 258 patients(61.2% Male) with mean age of 70.6+11.8 were identified. There were 19 TASC A(11 atherectomy;8 PTA) lesions, 34 TASC B lesions(23 atherectomy;11 PTA), 125 TASC C lesions(59 atherectomy; 66 PTA) and 234 TASC D lesions(129 atherectomy;105 PTA). There was no significant difference between co-morbidities of the two groups. The primary patency for TASC A lesions for atherectomy versus PTA was 66.7+19.2 vs 25.0+ 9.8 at 18 months.(p= 0.256). The primary patency for TASC B lesions for atherectomy versus PTA was 90.5+15.7 vs 66.7+15.7 at 18 months.(p>0.05) There was a statistically significant advantage for directional atherectomy when compared to PTA in the TASC C and D lesions for secondary patency and limb salvage for TASC C lesions(Table1).

Conclusions: There is a trend favoring directional atherectomy in the less complex TASC A and B lesions but a statistically significant advantage for Directional Atherectomy versus PTA for TASC C and D tibial lesions. Directional atherectomy should be considered for complex tibial lesions.

TASC C		Atherectomy (n=59)	PTA (n=66)	P value
Primary Patency (months)	12	81.3 ± 5.1	55.9 ± 7.3	.032
	18	68.8 ± 7.2	55.9 ± 7.3	.176
Secondary Patency (months)	12	84.9 ± 5.3	61.6 ± 7.2	.014
	18	72.2 ± 8.1	61.6 ± 7.2	.083
Limb Salvage (months)	12	88.9 ± 4.7	67.5 ± 7.0	.021
	18	88.9 ± 4.7	67.5 ± 7.0	.021
TASC D		**Atherectomy (n=129)**	**PTA (n=105)**	**P value**
Primary Patency (months)	12	53.9 ± 5.7	53.0 ± 7.0	.531
	18	49.4 ± 6.0	39.2 ± 7.9	.355
Secondary Patency (months)	12	73.4 ± 5.0	62.0 ± 6.8	.034
	18	69.2 ± 5.6	48.7 ± 8.7	.012
Limb Salvage (months)	12	81.5 ± 4.3	79.9 ± 5.1	.348
	18	76.9 ± 5.2	58.6 ± 9.9	.117

Table 1

#15 - LONG-TERM OUTCOMES FOLLOWING EX-VIVO RENAL ARTERY ANEURYSM REPAIR

Jason T Lee, MD , Mary Qiu, BS , Mediget Teshome, MD , Shyam S Raghavan, BS , Maureen M Tedesco, MD , E. John Harris, MD , Ronald L Dalman, MD , Cornelius Olcott, MD

Stanford University Medical Center, Stanford, CA US

OBJECTIVE: Renal artery aneurysms (RAAs) are increasingly diagnosed incidentally during abdominal imaging studies. Although the natural history of RAAs is poorly understood, patients present at younger ages, which may warrant an aggressive surgical approach to preserve kidney function. This study evaluates the outcomes of a contemporary single-center experience with ex-vivo RAA repair.

METHODS: Our preferred method of treatment for patients with RAA is ex-vivo reconstruction with hypogastric artery allograft. Patient demographics, presentation, perioperative factors, complications, clinical follow-up, and duplex surveillance were retrospectively examined.

RESULTS: Nineteen patients (15 female, 4 male) with a mean age of 47.9 years (11-77) underwent elective ex-vivo RAA repair from 1998-2008. Table 1 summarizes their symptomatology, comorbidities, anatomy, and perioperative and late complications. Mean aneurysm size was 2.3cm (0.9-4.0). Mean serum creatinine was 0.80mg/dL (0.48-1.20) pre-operatively, 1.02mg/dL (0.6-2.1) immediately post-operatively, and 0.79mg/dL (0.55-1.0) at discharge. No patients required hemodialysis, and 30-day mortality was 0%. At mean follow-up of 65.1 months (9-121 months), all patients are alive and have not required operative revision, nephrectomy, or renal replacement therapy. One (5%) underwent successful percutaneous balloon angioplasty of an anastamotic stricture. Annual duplex ultrasonography has confirmed adequate renal perfusion and continued graft patency in all remaining patients. Kaplan-Meier estimates of primary patency are 94% at 1-year, and 92% at 5-years.

CONCLUSIONS: Ex-vivo RAA reconstruction with hypogastric artery allograft preserves renal function with minimal procedural morbidity and mortality and provides excellent long-term graft patency. Future studies of novel approaches to RAAs, including laparoscopic and endovascular techniques, should be compared to these results.

Ex-vivo RAA repair 1998-2008	n=19	%
Presentation		
Unexplained hypertension	10	53%
Abdominal pain	6	32%
Recurrent UTI	3	16%
Gross hematuria	1	5%
Incidental finding	2	11%
Renal insufficiency	0	0
Comorbidities		
Hypertension	18	94%
Coronary artery disease	3	16%
Autoimmune disorders	1	5%
Diabetes	3	16%
Anatomic Considerations		
Bilateral RAA	1	5%
Other aneurysms	0	0%
Perioperative Complications		
Graft occlusion requiring nephrectomy	1	5%
Bleeding requiring re-exploration	1	5%
Renal replacement therapy	0	0%
Late Complications (Mean follow-up 60.7 months)		
Incisional hernia	1	5%
Nephrectomy	0	0%
Renal replacement therapy	0	0%
Anastamotic stricture	1	5%

Table 1

#16 - A CONTEMPORARY COMPARISON OF AORTOFEMORAL BYPASS AND AORTOILIAC STENTING IN THE TREATMENT OF AORTOILIAC OCCLUSIVE DISEASE

Christopher R Burke, BS , Peter K Henke, MD , Roland Hernandez, BA, JD , John E Rectenwald, MD , Venkat Krishnamurthy, MBBS, MD , Michael J Englesbe, MD , James J Kubus, MS , Jonathan L Eliason, MD

University of Michigan Health System, Ann Arbor, MI US

Purpose: Although aortofemoral bypass (AFB) has historically been the treatment of choice for aortoiliac occlusive disease (AIOD), rates of AFB have declined, while utilization of aortoiliac angioplasty and stenting (AS) has increased dramatically. Additionally, operative mortality for AFB is significantly higher when performed in lower-volume hospitals (< 25 AFB/Year). The objective of the current study was to determine the effect of these trends on treatment outcomes in a contemporary single-institution experience with aortoiliac artery occlusive disease.
Methods: Between 1997 and 2007, 118 AFB and 174 AS procedures were performed in 161 men (55.1%) and 131 women at a single University teaching hospital. Patient outcomes were retrospectively reviewed and analyses were performed using chi-square/Fischer's exact test and ANOVA.
Results: There was no difference between AFB and AS groups with respect to 30-day mortality (0.8% and 1.1%, P = 0.64), myocardial infarction (1.7% and 1.1%, P = 0.53), cerebrovascular accident (0.0% and 1.1%, P = 0.35), or renal failure requiring hemodialysis (3.4% and 1.2%, P = 0.19). AFB was associated with increase complication rates for the need for emergency surgery (6.8% and 1.7%, P = 0.029), infection/sepsis (16.1% and 2.3%, P < 0.001), transfusion (16.1% and 5.7%, P = 0.004), and lymph leak (8.5% and 0.6%, P = 0.001). The difference between pre-procedural and post-procedural ABI was greater for AFB than AS (R, 0.39 and 0.18, P < 0.001; L, 0.41 and 0.15, P < 0.001). When stratified by TransAtlantic InterSociety Consensus (TASC) category, change in ABI was no different for TASC A (AFB, N=2; AS, N=24), but was greater for TASC B (R, 0.27 and 0.23, P = 0.01; L, 0.25 and 0.12, P = 0.07), TASC C (R, 0.23 and 0.18, P = 0.007; L, 0.25 and 0.12, P = 0.033), and TASC D (R, 0.49 and 0.12, P < 0.001; L, 0.51 and 0.23, P = 0.02).
Conclusions: AFB continues to be performed safely, despite the case numbers in this series correllating with a lower-volume hospital. Morbidities associated with major open surgery in this series were counterbalanced by greater improvements in ABI. Patients should continue to entertain both procedure types as viable alternatives for the treatment of AIOD.

#17 - DIABETES AS A RISK FACTOR FOR PERIPHERAL VASCULAR SURGERY: DATA FROM THE VASCULAR SURGERY STUDY GROUP OF NORTHERN NEW ENGLAND

Brian W Nolan, MD, MS , Jens Elrdrup-Jorgensen, MD , Andrew C Stanley, MD , Adam W Beck, MD , Phillip P Goodney, MD, MS , Jack L Cronenwett, MD

Dartmouth Hitchcock Med. Ctr., Lebanon, NH US

INTRODUCTION: The Vascular Surgery Study Group of Northern New England is a consortium of eleven hospitals which collects surgical outcomes data in order to 'continuously improve the quality, safety, effectiveness, and cost of caring for patients with vascular disease'. A recent quality improvement effort of this group focused on post-operative blood glucose management. The goal of this study was to determine the impact of diabetes on the outcomes of carotid endarterectomy (CEA), open AAA repair, endovascular AAA repair (EVAR) and lower extremity bypass (LEB) in order to understand which patients may benefit most from this quality improvement effort.
METHODS: A retrospective cohort analysis was performed to compare post-operative complications in diabetics and non-diabetics. The sample included 4121 CEA, 2057 LEB, 1402 open AAA and 539 EVAR performed between 2003 and 2007. The primary outcome measure was any complication/death. Data were analyzed using univariate and multivariate regression.
RESULTS: Diabetes (any type) was present in 52% of patients undergoing LEB, 31% undergoing CEA, 20% undergoing EVAR and 15% undergoing open AAA repair. The prevalence of diabetes did not change over time. Diabetes was an independent predictor of any complication/death in patients undergoing LEB (table). Diabetes was not a predictor of death or complications in patients undergoing CEA, open AAA repair or EVAR.
CONCLUSIONS: Diabetes is a risk factor for post-operative complications in patients undergoing LEB, but not CEA or AAA repair. If a post-operative glucose management protocol can reduce diabetic-related vascular surgery complications, the population of patients undergoing LEB would statistically benefit the most.

	DM	no DM	p-value
Any complication, death	**32.1%**	**24.0%**	0.001
Bleeding or transfusion	19.9%	14.5%	0.001
MI	6.1%	2.4%	0.001
CHF	5.0%	2.3%	0.001
Renal Insufficiency	6.7%	3.2%	0.001
Dysrhythmia	5.4%	3.2%	0.025
Return to OR	16.1%	12.9%	0.045
Death	2.2%	1.8%	0.31
Respiratory	2.7%	2.0%	0.32
Wound	5.4%	5.3%	0.90

Post-operative complications following lower extremity bypass (diabetics vs. non-diabetics)

#18 - FACTORS ASSOCIATED WITH AMPUTATION OR GRAFT OCCLUSION AFTER LOWER EXTREMITY BYPASS IN NORTHERN NEW ENGLAND.

Philip P Goodney, MD , Brian W Nolan, MD , Jens Eldrup-Jorgensen, MD , Donald S Likosky, PhD , Jack L Cronenwett, MD

Dartmouth Hitchcock Med. Ctr., Lebanon, NH US

Objectives: Surgeons must weigh the morbidity incurred during lower extremity bypass (LEB) with the likelihood of a functional outcome after surgery. Therefore, we developed a model to predict amputation or

graft occlusion one year following LEB.

Methods: We studied a prospective registry of 2,515 patients who underwent LEB between 2003-2007 across 11 hospitals and 50 surgeons. Cox proportional hazards models were used to determine predictors of major amputation or graft occlusion within the first year post-operatively.

Results: Average patient age was 68, the majority (66%) of patients were male, and many had significant comorbidities (86% were hypertensive, 65% diabetic, and 41% had coronary disease). In most patients, the indication for surgery was critical limb ischemia (73%). At discharge, 4% of patients had experienced amputation or graft occlusion, and at one year follow-up by life table analysis, 25% of patients had undergone amputation or graft occlusion (Figure). Multivariate Cox models demonstrated that tarsal target vessels, diabetes, multisegment vein conduit, and need for revisional surgery during the initial hospitalization all increased the risk of amputation or occlusion. Beta blockade, lack of tissue loss, and independent living status all decreased risk of amputation or graft occlusion (Table). Using this model for risk adjustment, most hospitals in our region performed as expected. However, the amputation or graft occlusion rate at one high-performing hospital was 30% lower than expected (observed versus expected rate = 9% versus 13%, p=0.05%).

Conclusions: Using these variables, surgeons can risk-stratify patients and inform them more precisely about their likelihood of amputation or graft occlusion one year after surgery, as well as compare risk-adjusted outcomes across centers and facilitate quality improvement efforts.

#19 - NOVEL SURGEON-MODIFIED HYPOGASTRIC BRANCHED ENDOGRAFT TO PRESERVE PELVIC PERFUSION

Joseph J Ricotta II, MD , Gustavo S Oderich, MD

Mayo Clinic, Rochester, MN US

Objective: To describe the feasibility and early results of a novel approach to preserve pelvic perfusion during endovascular aortic aneurysm repair (EVAR) in patients with aorto-iliac aneurysms extending to the iliac bifurcation.

Methods: A 63 year-old male presented with bilateral 5-cm common iliac artery aneurysms extending to the iliac bifurcations, a 6-cm abdominal aortic aneurysm, and pelvic pain. Co-morbidities included un-reconstructable coronary artery disease, severe pulmonary dysfunction, and congestive heart failure with an ejection fraction of 10%. These aneurysms were repaired under local anesthesia by embolization of the left hypogastric artery and placement of a surgeon-modified branched endograft into the right hypogastric artery. The modified device was created using a 10-mm iliac stent graft with a pre-sewn 7-mm side graft. It was re-sheathed into a 22Fr sheath and the side graft was preloaded with a wire and catheter. Using the preloaded catheter, a long wire was snared establishing through-and-through femoral access. A 12Fr sheath was advanced up and over the aortic bifurcation into the pre-sewn side graft. The repair was bridged to the hypogastric artery using a self-expandable stent graft and extended distally to the external iliac artery, followed by standard EVAR.

Results: The patient was discharged on post-operative day 2 without complication. At 6 months, all symptoms had resolved and the branched endograft remained patent without endoleak, migration, or loss of device integrity.

Conclusion: Surgeon-modified branched endografts to maintain perfusion to one or both hypogastric arteries is feasible and provides an alternative to hypogastric artery exclusion.

Completion angiogram demonstrating patent surgeon-modified branched endograft to right hypogastric artery.

#20 - RUPTURED PERSISTENT SCIATIC ARTERY ANEURYSM MANAGED BY ENDOVASCULAR EMBOLIZATION – A CASE REPORT.

Stephen R Broderick, MD , Duncan Hughes, MD , Combiz Rezayat, MD , Alexander Gart, MD , Ageliki Vouyouka, MD

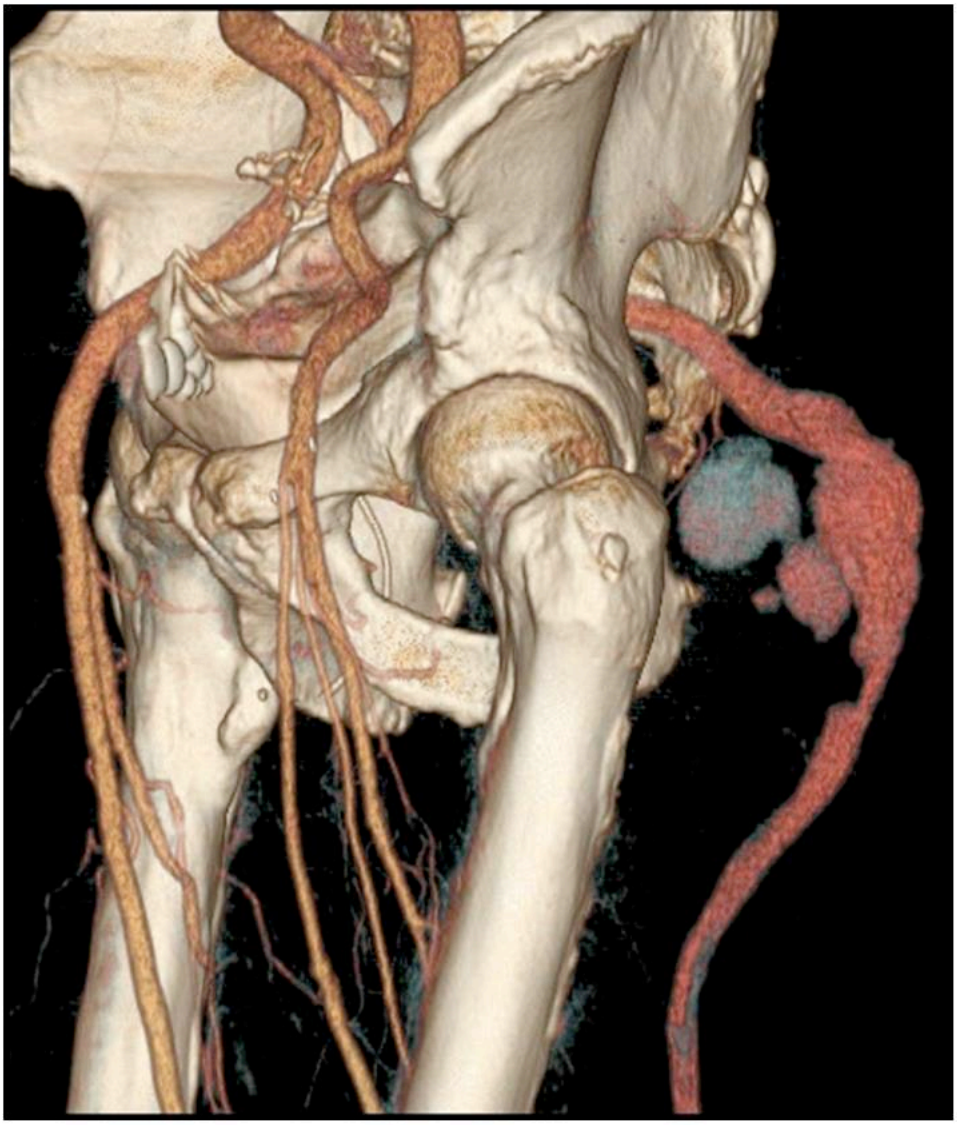
New York Presbyterian Hospital Weill Cornell Medical Center, New York, NY US

Objectives
Persistent sciatic artery (PSA) occurs in 0.01-0.05% of the population. It may result in aneurysm, distal embolization, sciatic neuropathy or rupture. We describe a case of PSA aneurysm complicated by distal ischemia and rupture.

Methods
A 70 year old male, initially presented with acute left lower extremity ischemia. He was found to have a PSA aneurysm, absent superficial femoral artery (SFA) and occluded popliteal artery. He underwent embolectomy of the popliteal artery, femoral-popliteal bypass and ligation of the proximal popliteal artery to prevent further embolization. Four weeks later he presented with severe pain, a pulsatile buttock mass and hemodynamic instability. CT angiogram demonstrated a ruptured 5 cm PSA aneurysm (fig 1A). Emergent intervention involved crossing of the PSA aneurysm with a stiff glide wire and deployment of two 14mm Amplatzer plugs to occlude both inflow and outflow to the aneurysm.

Results
There was complete exclusion of the aneurysm (Fig 1B). Patient remained stable and pain free, however he developed foot drop. He was discharged on postoperative day 4.

Conclusion
To our knowledge this is the only report of ruptured PSA aneurysm excluded with endovascular means. In the absence of SFA, simultaneous revascularization of the lower extremity, by femoropopliteal bypass, is necessary to prevent distal ischemia. The patient presented here had previously undergone a femoropopliteal bypass allowing for simple exclusion of the aneurysm. Foot drop possibly due to sciatic nerve ischemia after the exclusion of the PSA aneurysm is a likely complication also observed in open PSA ligation.



CT angiogram demonstrates rupture of PSA aneurysm

#21 - STICKY PLATELET SYNDROME: AN UNUSUAL PRESENTATION OF ARTERIAL ISCHEMIA

Michael O Bojalian, MD , A. George Akingba, MD, PhD , Gonzalo P Obnial, MD , Diego A Hernandez, MD , Barbara D Moreira, MD , Paul G Bove, MD , O. William Brown, MD, JD , Jeffrey R Rubin, MD

Division of Vascular Surgery, Wayne State University/Detroit Medical Center, Detroit, MI US

We report a case of a 48-year old female nurse who presented with bilateral lower extremity critical limb ischemia. In addition to this, her work-up revealed multiple other thrombo-embolic insults including cerebral and visceral emboli. Initial laboratory findings were significant for an indeterminate platelet count, secondary to platelet clumping. After appropriate emergent surgical treatment including bilateral lower extremity embolectomy, the patient was empirically anticoagulated with a direct thrombin inhibitor. Further embolic workup discovered bilateral renal and splenic infarctions, as well as, a large mobile mitral vegetation. She was also noted to have periodontal disease. Finally, an upper extremity duplex revealed left axillary, left subclavian and right internal jugular acute deep vein thromboses. Mitral valve replacement was performed to remove the septic source. A series of hypercoagulability studies were done and results were positive for Lupus anticoagulant and sticky platelet syndrome (SPS).
Sticky platelet syndrome is an autosomal dominant disorder of hyperactive platelets that aggregate in vitro, with low concentrations of Adenosine 5'-Diphosphate (ADP) and epinephrine. The disorder predisposes to, rather than causes thrombosis. An additional risk factor is usually necessary to result in thrombosis. In this case, the initial predisposing risk factor was likely periodontal infection resulting in a mitral valve septic thrombus. SPS is associated with both arterial and venous thrombosis. The treatment for this syndrome involves lifetime aspirin therapy. Heparin and Coumadin have not been found to be effective as cases of recurrent thrombosis have been reported with therapeutic anticoagulation.

#22 - SUPRARENAL FIXATION INDUCES RENAL ARTERY NEOINTIMAL HYPERPLASIA IN ENDOVASCULAR AORTIC ANEURYSM REPAIR

Shree K Subedi, MD , Andy M Lee, MD , Gregg S Landis, MD

New York Hospital Queens, Flushing, NY US

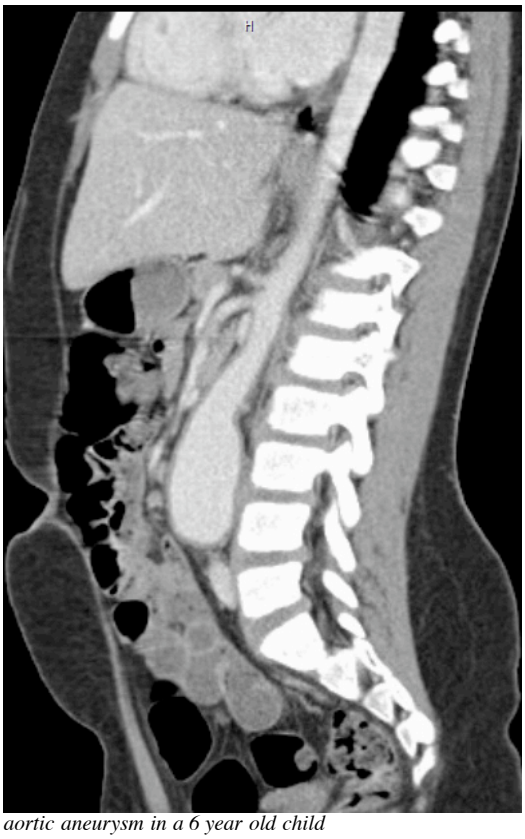
Renal artery occlusion following endovascular abdominal aortic aneurysm repair (EVAR) with suprarenal fixation is uncommon. We report one patient who was found to develop renal artery occlusion and parenchymal infarction six months after EVAR using the Zenith endovascular graft with suprarenal fixation. Our patient underwent urgent endovascular repair of a symptomatic 6 cm abdominal aortic aneurysm. The covered portion of the endograft was inadvertently deployed well below the renal artery orifices, but given the long length of the infrarenal neck, was felt to provide adequate fixation. At the completion of the procedure both renal arteries were confirmed to be patent. A one-month postoperatively a CT scan showed exclusion of the aortic sac and normal enhancement of both kidneys. Six months postoperatively, the patient was found to have increasing creatinine levels despite having no clinical symptoms. CT scanning revealed a non-enhancing left kidney and angiography demonstrated an occlusion of the left renal artery, with signs of severe intimal hyperplasia. A barb welded to the bare metal stent appeared to be impinging on the left renal artery. Angulation in the aortic neck may have also contributed to excessive metallic coverage of the renal ostium. This case illustrates that renal artery occlusion after EVAR can occur due to repetitive injury to the renal artery orifice, and that neointimal hyperplasia can be induced by the bare metal stent overlying the renal ostium. To our knowledge, this is the first reported case of renal artery intimal hyperplasia caused by repetitive injury from transrenal fixation systems.

#23 - IDIOPATHIC ABDOMINAL AORTIC ANEURYSM (AAA) IN A 6-YEAR-OLD CHILD

Albert J Chong, M.D. , Michael J Gaffud, M.D. , Keith E Georgeson, M.D. , William D Jordan, M.D.

University of Alabama at Birmingham, Birmingham, AL US

Abdominal aortic aneurysm (AAA) in the pediatric population is extremely uncommon. AAA in infants and children can be congenital, acquired, or idiopathic. A six year old girl presented with persistent abdominal and back pain after having undergone treatment for a febrile illness with antibiotics. An abdominal ultrasound and a subsequent CT scan showed a 3.5 cm infrarenal aortic aneurysm. Multidisciplinary workup excluded infectious, rheumatologic, and connective tissue etiologies. She underwent an open AAA repair with a PTFE graft. She had an uneventful recovery and was discharged on the 7th day after surgery. Intra-operative cultures and tissue samples revealed no definite etiology. Most aortic aneurysms are acquired or secondary to infection, trauma, vasculitis, or connective tissue disease. True idiopathic aneurysms are rare, and only few cases have been published in the literature. Management of aortic aneurysms in children require a thorough multidisciplinary workup and careful operative planning, cognizant of the potential for growth. We present the successful operative treatment of an idiopathic, infrarenal AAA in a six year old girl. The etiologic workup, surgical management, and a literature review of pediatric aortic aneurysms are presented.



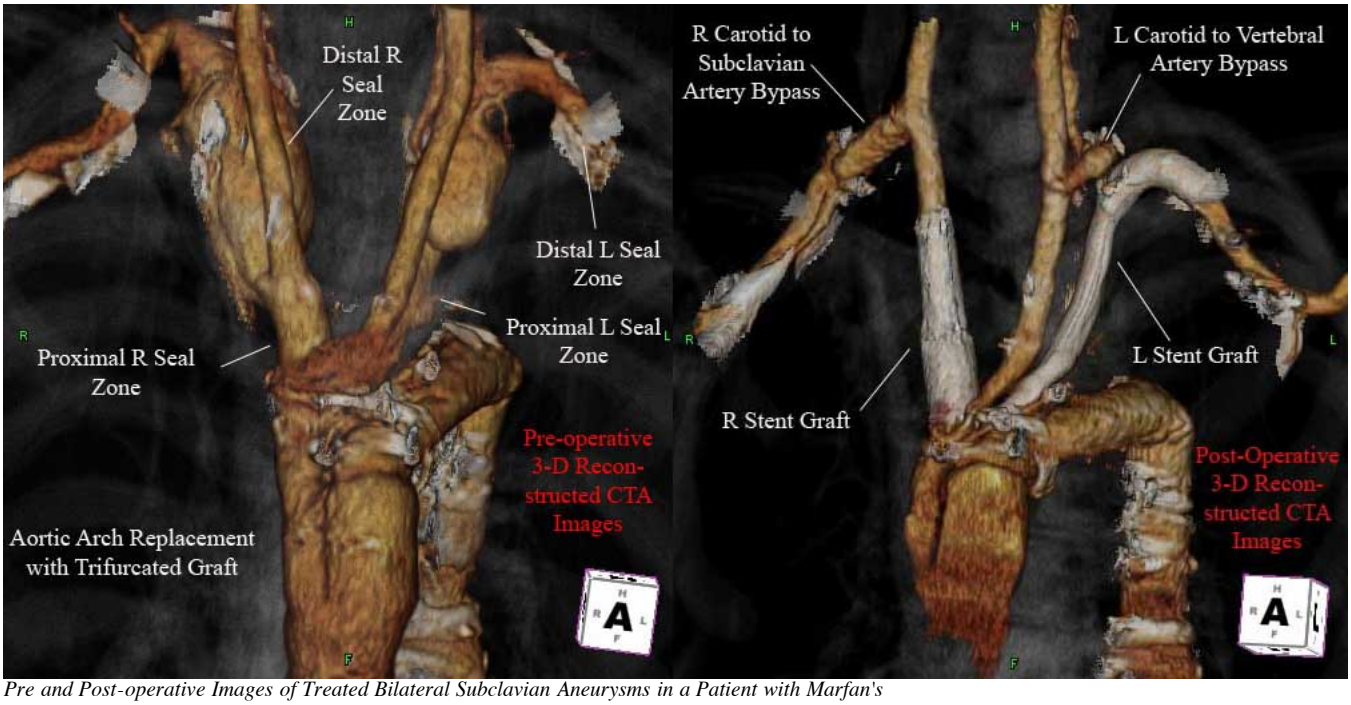
aortic aneurysm in a 6 year old child

#24 - COMBINED ENDOVASCULAR AND OPEN REPAIR OF BILATERAL SUBCLAVIAN ARTERY ANEURYSMS IN A PATIENT WITH MARFAN'S SYNDROME

Jonathan N Bowman, MD , Sharif H Ellozy, MD , Plestis Konstadinos, MD , Marin L Michael, MD , Faries L Faires, MD

Mount Sinai School of Medicine, New York, NY US
Mount Sinai School of Medicine; New York, NY US

A 33year old male with Marfan's syndrome presents with enlarging bilateral subclavian artery (SCA) aneurysms. The patient has suffered multiple complications of Marfan's syndrome. His entire aorta, including aortic valve, and bilateral common iliac arteries have been replaced. The L sided SCA aneurysm is an anastomotic pseudoaneurysm and measures 3cm. The R sided SCA aneurysm developed from a chronic dissection and measures 6cm. (Figure 1A)
The L SCA aneurysm was treated by creating a vein graft bypass from the L common carotid artery (CCA) to the dominant L vertebral artery (VA). The L VA, internal mammary artery (IMA) and thyrocervical trunk were ligated at their origin. Three 10mm Viabahn stent grafts of varying lengths were deployed via a left brachial approach. The stent grafts extended from the SCA arm of the trifurcated graft to the axillary artery. (Figure 1B)
At a second operation, the R SCA aneurysm was treated by anastomosing a 10mm Hemashield conduit to the R CCA. Through the conduit, a 16mm to 12mm x 7cm tapered Gore Excluder iliac limb stent graft was deployed. The stent graft extended from the origin of the innominate artery trifurcated graft limb to the R CCA; excluding the origin of the R SCA. The R VA, IMA, and thyrocervical trunk were ligated at their origin. After deployment of the stent graft, the conduit was anastomosed to the R SCA distal to the aneurysm. The patient recovered uneventfully from all interventions.
Utilizing hybrid endovascular therapy, the morbidity of re-operative sternotomy and thoracotomy was avoided.



Pre and Post-operative Images of Treated Bilateral Subclavian Aneurysms in a Patient with Marfan's Syndrome

#25 - RENAL ARTERY STENT INFECTION AND PSEUDOANEURYSM MANAGEMENT

Christopher L Stout, MD , Jean M Panneton, MD , Marc H Glickman, MD

Eastern Virginia Medical School, Norfolk, VA US

Objective:

Infection of a renal artery stent and pseudoaneurysm is extremely uncommon with four reports in the literature. We present a case and the complex management resulting in kidney salvage.

Methods:

A 56-year-old female underwent right renal artery stenting for hypertension. Post-operatively she developed methicillin-resistant-Staphylococcus infection treated with antibiotics. 8-month follow-up duplex ultrasound revealed a right renal artery pseudoaneurysm just distal the stent. A computed tomography angiography (CTA) proved 2.8 centimeter proximal and 4.2 centimeter distal mycotic aneurysms. Antibiotics and planning angiogram were prescribed.

Results:

A Chevron incision and duodenal Kocherization were employed. The aorta below the superior mesenteric artery and below the renal vein was mobilized as was the right renal artery and vein, hepatic artery, and saphenous vein. Following heparinization, the aorta was cross clamped as was the right renal artery at the hilum. The kidney was infused with cold saline. The renal artery stent was removed and aneurysmectomy performed. The renal artery ostium was oversewn. A renal artery to hepatic artery saphenous vein bypass was fashioned and patency confirmed with intraoperative duplex ultrasound. Postoperatively, creatinine was normal, renal scan showed the right kidney to be functional and duplex ultrasound showed a patent bypass graft. The patient was discharged postoperative day eleven on long-term antibiotics. Eight month follow-up duplex and CTA showed a patent bypass and durable repair.

Conclusions:

Renal artery stent infection with pseudoaneurysm is rare and can be diagnosed with duplex ultrasound. Renal salvage can be obtained, but requires stent removal and autologous bypass grafting.

#26 - ENDO-NEEDLE RECANALIZATION AND STENTING OF A LONG-CENTRAL VENOUS OCCLUSION IN A PATIENT WITH MASSIVE ARM-EDEMA

Chad R Laurich, MD , Rachael M Nicholson, MD , David Wong, MD , William J Sharp, MD , Timothy F Kresowik, MD , Jamal J Hoballah, MD , Mel J Sharafuddin, MD

University of Iowa College of Medicine, Iowa City, IA US

81 y.o. female with end-stage renal disease and a complicated history of multiple prior failed upper extremity hemodialysis accesses. Her last remaining viable access is via a Rt brachiocephalic arteriovenous fistula, which became complicated by a chronic occlusion at the brachiocephalic-SVC junction. Recanalization was attempted unsuccessfully elsewhere and was complicated by perforation necessitating coiling. Her last venogram revealed thrombosis of the entire brachiocephalic vein with maintained patency of the subclavian vein via numerous shoulder, neck and chest wall collaterals. The patient developed progressive symptoms of venous hypertension in her Rt upper extremity, neck and breast area with massive edema and weeping ulcers. She had no other routes suitable for a permanent central venous hemodialysis catheter. We therefore decided to proceed with central venous recanalization. Using a combined approach through the fistula outflow and the Rt common femoral vein. Multiple attempts at conventional recanalization utilizing various catheter-guide wire combinations were unsuccessful. The decision was made to proceed with sharp recanalization utilizing a home made directional coaxial needle puncture system (Figure). The puncture was made from the lower pressure SVC stump into the higher pressure subclavian stump, through approximately a 4.5 cm long occlusion, using a 21 gauge needle. Position in the proper lumen was confirmed by contrast injection and a 0.014 guide wire was advanced and snared from the arm sheath establishing a through-and-through access. The recanalized tract between the two stumps was checked by contrast injection confirming the lack of free mediastinal extravasation or filling of arterial branches. We deployed a 14 mm x 60 mm bare nitinol stent flaring its ends into the two stumps. We then also deployed a covered stent inside the bare stent across the recanalized tract to prevent subsequent extravasation. Venography revealed excellent patency with restoration of brisk forward flow from the fistula through the central veins into the right atrium, and cessation of venous collateral filling. The patient did very well with complete resolution of her venous hypertension and its secondary symptoms and continue to dialyze successfully through this access nearly 6 months later.

Sharp puncture apparatus:
- 16 gauge outer directional canula
- 21 gauge inner puncture needle

4.5 cm tract between the subclavian-jugular confluence and the SVC stump

Tract injection following establishment of the through and through access

Final result following stenting

#27 - ADJUVANT MANEUVERS TO AFFECT ENDOGRAFT TILT IN ANEURYSMS WITH ANGULATED NECKS

Nick N Abedi, MD , Eleftherios S Xenos, MD , Ehab E Sorial, MD , Eric D Endean, MD , David J Minion, MD

University of Kentucky Med. Ctr., Lexington, KY US

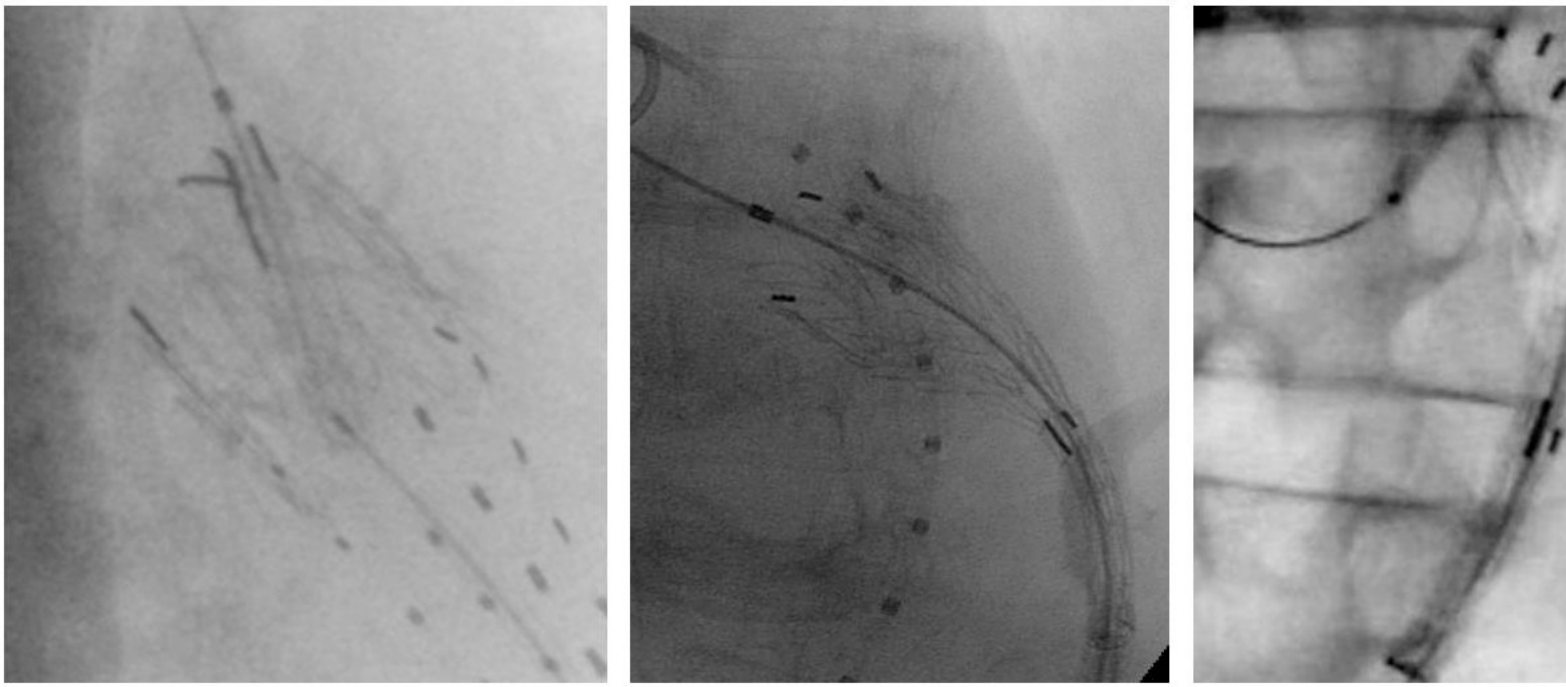
Background: Severe proximal neck angulation remains a significant challenge during EVAR. The challenge lies in aligning a straight endograft with the curvature of an angulated aorta. The purpose of this study is to report our experience with maneuvers to improve this alignment.

Methods: In 9 cases (4 primary and 5 as treatment for endoleaks) graft tilt was physically manipulated during deployment. Three different techniques were used (Figure): 1.) Bending of Lunderquist Wire, 2.) Body Floss and Bowing of Wire, and 3.) Endowedge Technique. Intra-operative films were analyzed to determine degree of angulation changed by each maneuver.

Results:
Bending of Wire was attempted 7 times in five cases (1 main body, 6 cuffs). In 3 instances, graft tilt was minimally affected (although seal achieved in one.) In 4 cases (all cuffs) graft tilt was altered approximately

25 degrees. Placing a second wire bend appeared to improve success.
Bowing of Wire was attempted 3 times in 3 cases (2 main bodies, 1 cuff). In each case, graft tilt was altered approximately 35 degrees and seal achieved.
Endowedge was used once in a main body, achieving seal and altering graft tilt approximately 25 degrees.

Conclusion: Graft tilt can be physically altered with adjuvant maneuvers during endograft deployment. These maneuvers can be used primarily in angulated necks, or for salvage in cases of endoleaks. In our small series, Bowing of Wire was most effective, but requires adjuvant brachial access. Bending of Wire is less invasive, but may be better suited for cuffs or main bodies for less angulated necks.



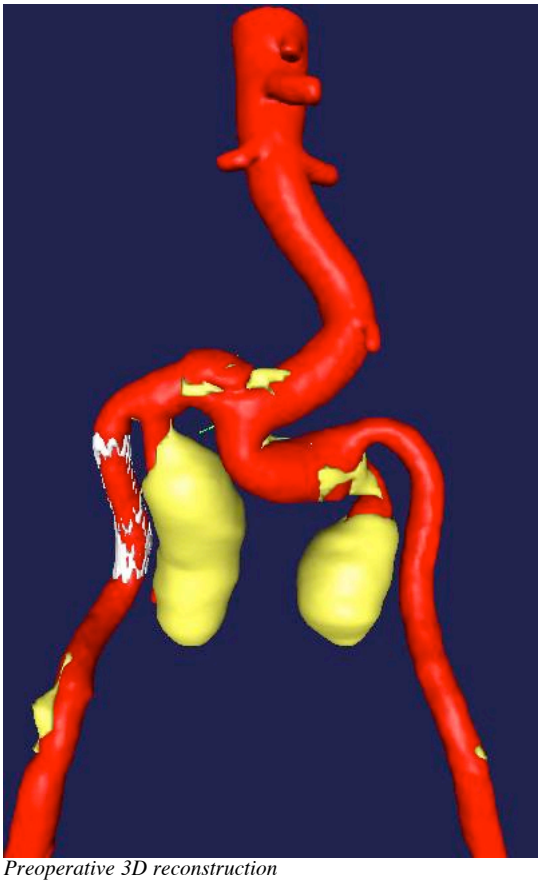
Figure

#28 - THE MANAGEMENT OF LARGE BILATERAL INTERNAL ILIAC ARTERY ANEURYSMS USING THE T-STAT COLON OXIMETER

Eugene S Lee, MD , David L Dawson, MD

University of California, Davis, Sacramento, CA US

66 yo male presents with history of bilateral 4.3 cm internal iliac artery aneurysms. An attempted repair at another facility was performed and the right internal iliac artery was coil embolized. Intraoperative perforation occurred at the right external iliac artery with large retroperitoneal hematoma. Perforation was repaired with a covered stent in the right external iliac artery. The planned procedure was aborted. The patient now presents with continued bilateral internal iliac artery aneurysms requiring treatment. Staged embolization of the internal iliac arteries and coverage of both internal iliac arteries and repair with Powerlink stent graft planned from infrarenal aorta to external iliac arteries bilaterally. Intraoperative use of a T-stat colon oximeter was used to assess for colon ischemia during balloon inflation prior to embolization. No change in colon oximetry was detected. The left internal iliac artery was embolized using an Amplatzer plug. Two weeks later, the right internal iliac artery was embolized using another Amplatzer plug. The right iliac and aorta underwent Powerlink stent graft placement and a right to left femoral to femoral bypass was performed. No evidence of colon ischemia or pelvic ischemia found. The patient has continued buttock claudication at short distances.



Preoperative 3D reconstruction

#29 - DORSALIS PEDIS ENTRAPMENT SYNDROME - THE FIRST REPORTED CASE

Katie Weichman, MD , Todd Berland, MD , Brendan MacKay, MD , Mark Adelman, MD

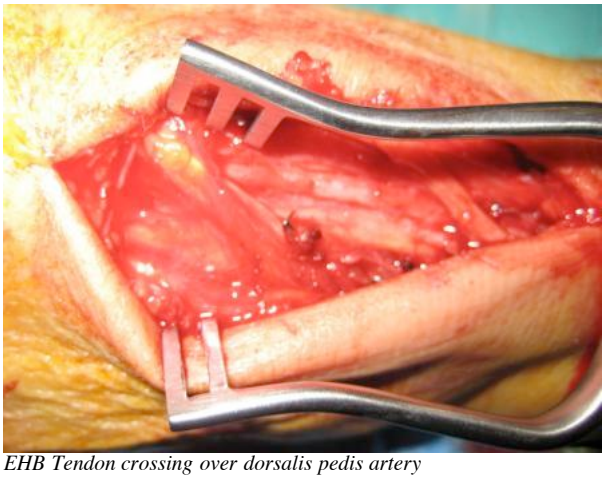
NYU, New York, NY US
New York University; New York, NY US

INTRODUCTION:
In this report, we present the seminal case of dorsalis pedis artery entrapment by the extensor hallucis brevis tendon during severe dorsiflexion of the foot.

CASE PRESENTATION:
The patient is a healthy 42 year old male who presented with claudication in both feet upon severe dorsiflexion. He underwent dynamic arterial duplex studies that first revealed normal flow in the neutral position, but demonstrated complete cessation of flow on dorsiflexion of foot. He also underwent a formal arteriogram of both lower extremities and this revealed an incomplete pedal arch with early termination of posterior tibial artery on static images and termination of the dorsalis pedis artery during dorsiflexion.

MANAGEMENT:
The patient was taken to the operating room, and during exploration was found to have entrapment of the dorsalis pedis artery by the extensor hallucis brevis tendon(EHB). This was documented by both direct visualization and intraoperative cessation of doppler signal on dorsiflexion. In light of minimal synergistic function of extensor hallicus brevis tendon, the tendon was transected near it's insertion and transposed to the extensor hallicus longus tendon without loss in ability to dorsiflex the great toe. After tendon transection, triphasic doppler signals could be appreciated both in the neutral and dorsiflexed positions of both feet.

CONCLUSTION: Dorsalis pedis arterial entrapment is a novel cause of atypical claudication. Patients must have both abnormal anatomy and an incomplete pedal arch to display symptoms. In this case, transection and transposition of the EHB tendon allowed for improved flow into the dorsalis pedis artery.



EHB Tendon crossing over dorsalis pedis artery

#30 - EVAR IN A PATIENT WITH SYMPTOMATIC TASC D AORTOILIAC OCCLUSIVE DISEASE AND A SYMPTOMATIC AAA

Timothy Wu, MD , John G Carson, MD , Christopher L Skelly, MD

The University of Chicago Medical Center, Chicago, IL US
The University of Chicago Medical Center; Chicago, IL US

The combination of TASC D aortoiliac occlusive disease as well as a symptomatic abdominal aortic aneursym is not a common occurrence. Extensive calcified atherosclerotic disease, occlusions, and small iliofemoral segmental arteries make transfemoral access difficult, if not impossible for endovascular aneurysm repair (EVAR) in these patients. We present a case in which “controlled rupture” of the external iliac artery with a covered stent allowed transfemoral delivery of an aorto-uniiliac stent graft with a completion femoral to femoral bypass.

The patient is a 60 year old gentleman with a 5.3 cm symptomatic infrarenal abdominal aortic aneurysm and a history of 1-block leg claudication. Preoperative CT angiography revealed the patient to have occlusion of the right common iliac artery, extensive calcified stenoses of his aortoiliac segments, and a prohibitively small left external iliac artery which measured a mere 4.5mm at its narrowest point. The patient, despite discussions concerning the suitability of his iliac arteries as conduits for the delivery of the stent graft, preferred an endovascular approach to lessen his chances of postoperative sexual dysfunction.

The operation utilized a femoral artery cutdown and attempts at dilating the left external iliac artery using 16 French dilators without success. We then utilized an 8mm x 5cm covered self-expanding stent to line the left external iliac artery followed by a controlled rupture performed with an 8mm noncompliant balloon to disrupt the vessel. This internal conduit now allowed accommodation of our 18 French introducer for the aorto-uniiliac stent graft. The operation was completed with a femoral-femoral bypass. Flow to both hypogastric arteries was preserved.

We believe use of such techniques will ultimately expand the number of patients eligible for EVAR and avoids devastating access-related complications.

#31 - INTERNAL ILIAC ARTERY ANGIOPLASTY AND STENTING: AN UNDERUTILIZED THERAPY

Kari Thompson, MD , Patrick Cook, DO , Ralph B Dilley, MD , Moshin Saeed, MD , Harry J Knowles, MD , Thomas Terramani, MD , Nikhil Kansal, MD

UCSD, San Diego, CA US
Scripps; San Diego, CA US

Objectives: Internal iliac artery (IIA) stenosis is a common finding in patients undergoing angiography. In patients with localized thigh and buttock claudication, endovascular treatment of an isolated IIA stenosis may lead to symptom improvement. Patients undergoing unilateral IIA embolization for EVAR may also represent a subgroup of patients who may benefit from contralateral IIA intervention.

Methods: We retrospectively reviewed the records of nine patients who underwent IIA intervention for symptomatic thigh/buttock claudication. Patient demographics, angiographic status of both internal iliac arteries, and technical success was assessed by chart and angiogram review. Symptom relief was considered a successful outcome.

Results: 9 patients underwent unilateral or bilateral internal iliac artery angioplasty and/or stenting. There was a 100% technical success rate and no complications. 6 patients underwent a bilateral intervention and 3 underwent unilateral intervention. 15 arteries were treated. 7 arteries were treated with angioplasty, 2 with

angioplasty and stenting, and 6 with primary stenting. Of the 9 patients treated, 7 patients had symptomatic relief from their claudication.

Conclusions: Percutaneous angioplasty and stenting of the IIA is technically feasible and safe. In patients who present with isolated thigh and buttock claudication, we should maintain a high index of suspicion for IIA stenosis. A majority of patients undergoing these procedures have significant symptomatic improvement. Percutaneous intervention has not been reported previously, and should be an endovascular treatment option given its low morbidity and success rate.

#32 - DO SAPHENOPOPLITEAL AND SAPHENOFEMORAL INCOMPETENCE RESPOND SIMILARLY TO TREATMENT WITH SURGERY AND ENDOVENOUS LASER THERAPY: A QUALITY OF LIFE ANALYSIS

Daniel Carradice, MBChB MRCS , Peter McCollum, MBChB FRCS , Ian Chetter, MBChB FRCS

, Hull, Intl. GB
Academic Vascular Surgical Unit, University of Hull; Hull, Intl. GB

Objective
One of the aims of minimally invasive interventions such as Endovenous Laser Therapy (EVLT) is the ability to decrease initial deterioration of quality of life (QoL) post-intervention. Trials are underway to establish differences between surgery and EVLT. Many trials mix patients with both long (LSV) and short saphenous (SSV) disease. There is no evidence that both groups respond similarly to treatment and our aim was to compare the treatment effect on LSV and SSV incompetence.

Methods
This study was performed using an ongoing RCT database. Patients were split into isolated LSV and SSV disease and compared in both surgical and EVLT treatment arms.

Outcomes:
-QoL – Disease specific (Aberdeen Varicose Vein Questionnaire – AVVQ), Generic (Short Form-36 – SF-36 and Euroqol – (EQ5D) (- all measured at baseline, 1, 6, 12 and 52 weeks) and domain specific (Visual analogue pain scores days 0-7).
-Objective venous scoring (Venous clinical severity score – VCSS at 12 and 52 weeks)
-Time to return to work and normal activity.
-Patient satisfaction (Visual analogue scale).

Results
There was no difference in baseline QoL for any group.

Surgery: (n=101-LSV, 27-SSV)
At 6 weeks, patients with SSV disease scored significantly higher on AVVQ than LSV (median-9.058 (5.434-11.875) vs. 5.496 (1.844-10.369) p=0.045). SSV patients also scored lower in the social function domain of SF-36 (87.5 (53-100) vs. 100 (75-100) p=0.015).

EVLT: (n=193-LSV, 38-SSV)
At 1 week, patients with SSV disease scored significantly lower on AVVQ than LSV (13.963 (11.669-19.305) vs. 17.636 (13.386-22.486) p=0.042).

Conclusions
SSV disease responds differently to LSV disease. In the early post surgical period, QoL is worse for patients with SSV reflux, whereas post EVLT, QoL is better for SSV than for LSV sufferers. RCTs should consider patients with LSV and SSV reflux separately.

#33 - UPPER EXTREMITY DEEP VENOUS THROMBOSIS (UEDVT): REASSESSING THE RISK OF SUBSEQUENT PULMONARY EMBOLUS

Mark M Levy, M.D., R.V.T , Christopher Bach, B.S. , Ruth Fisher-Snowden, R.N., R.V.T.

The Medical College of Virgina, Richmond, VA US

The incidence of UEDVT diagnoses has increased with the increased use of peripherally inserted catheters, dialysis catheters, and defibrillator and pacemaker leads. Nevertheless, anticoagulation therapy is inconsistent and of variable duration. This study sought to analyze our institutions' current treatment practices for UEDVT and assess the risk for subsequent pulmonary embolism (PE).

Methods: Between 4/2005 and 7/2007, 200 consecutively encountered Peripheral Vascular Lab patients with UEDVTs were identified. UEDVT location and sonographic characteristics, patient demographics, anticoagulation treatment, and PE incidence and mortality were then examined from patients' medical records.

Results: Among the 200 patients, there was deep venous obstruction in the distal innominate (n=33), internal

jugular (n=115), subclavian (n=114), axillary (n=69), and brachial veins (n=33). Forty one patients (21%) had UEDVTs identified as acute based upon sonographic appearance, and forty-nine patients (25%) had associated obstruction of UE superficial veins. Most patients with UEDVTs were symptomatic (n=188, 83%). Sixty-six patients had documented malignancy (33%), 58 were post-operative or trauma patients (29%), and 51 were obese (BMI>30, 26%). In addition, 152 patients had associated current or previous indwelling lines or leads (76%). Seventy-five patients (38%) had died at the time of the data-base analysis (07/08). Seventy-one patients (36%) were initially anticoagulated with heparin, while 62 patients were eventually converted to coumadin therapy (31%) for variable lengths of time.
Four patients (2%) suffered PE following or associated with their UEDVT diagnosis. However 2 of these were more likely attributable to more recently diagnosed lower extremity DVTs, having UEDVT diagnosed 10 and 16 months prior. Of the remaining 2 patients (1%), one had an asymptomatic PE diagnosed 6 months following a lovenox-treated brachial vein DVT; a second had a symptomatic PE diagnosed simultaneously with an axillosubclavian DVT, and was subsequently treated with lovenox and coumadin. An additional 2 UEDVT patients treated with coumadin died months after hospital discharge from intracranial bleeds following minor falls.

Conclusion: The incidence of PE attributable to previously documented UEDVT is very small (1%), regardless of anticoagulant therapy. Anticoagulation therapy for UEDVT is likely best suited to address the symptoms of UEDVT; its proposed use to decrease the very small risk of PE may be rarely indicated.

#34 - OUTCOME OF THE VIABAHN ENDOPROSTHESIS TO SALVAGE FAILED ARTERIOVENOUS ACCESSES

Keith M Webb, MD , David L Cull, MD , Christopher G Carsten, MD , Anna Cass, MS , Corey A Kalbaugh, MS

Academic Department of Surgey, Greenville, SC US
Greenville Hospital University Medical Center; Greenville, SC US

Background: Since elements of the Dialysis Outcome Quality Initiative (K/DOQI) were implemented a decade ago, there has been a reduction in mortality for patients on hemodialysis. As patient longevity has increased, AV access site preservation by salvaging failed arteriovenous (AV) accesses has become increasingly important. However, efforts to salvage an AV access must be balanced against futile and expensive procedures. The Viabahn Endoprosthesis is a self-expandable stent graft that can be used to treat vein rupture or fibrotic lesions with significant elastic recoil following balloon angioplasty. The literature comprising the outcome of the Viabahn Endoprosthesis in salvaging failed AV accesses is limited. The purpose of this study is to determine the outcome of failed AV accesses treated with the Viabahn endoprosthesis and to identify patient or graft factors predictive of success.
Methods and Materials: The vascular access database, and office, hospital, and dialysis unit records were retrospectively reviewed to identify all patients who underwent placement of a Viabahn endoprosthesis for the treatment of a thrombosed AV access between September 2004 and December 2007. Mean patient follow-up was 6 months. The K/DOQI goal for patency following an endovascular intervention (> 4 months) was used to determine procedure success or failure. Kaplan Meier life table analysis was utilized to determine patency. Patient demographics and graft factors (location, diameter, length) were analyzed to identify predictors of success.
Results: Fifty five Viabahn endoprostheses were placed in 48 patients (male 35%; mean age 61 years; diabetes mellitus 51%) with a failed AV access. The indications were to treat significant elastic recoil or vein rupture following balloon angioplasty (47 patients) and to treat an AV graft seroma (1 patient). Cost per patient for the Viabahn endoprosthesis ranged from $2337 to $3367. The procedure was successful (K/DOQI definition) in 44% of patients. The overall primary patency rate was 30% at 6 months.
Procedure success was not influenced by AV access location, endoprosthesis size (diameter or length), or patient demographic factors (p-values >0.05).
Conclusions: Use of the Viabahn endoprosthesis to salvage AV accesses falls short of the current K/DOQI clinical outcome goals for successful endovascular intervention in the majority of cases. Given these results and the high cost of the Viabahn endoprostheses, its use is indicated in cases where AV access salvage will have an impact on long-term patient survival such as for patients in whom there are few options for new access placement. Further studies are needed to compare the Viabahn endoprosthesis to less costly options, such as bare metal stents.

#35 - EXPANDING PRIMARY AND SECONDARY EVAR OPTIONS USING THE ZENITH RENU AORTO-UNI-ILIAC DEVICE

Martin R Back, MD , Ann S Lopez, ARNP

University of South Florida Vascular, Tampa, FL US

Background : We present our mid-term experience with the Cook Zenith Renu aorto-uni-iliac (AUI) endograft device (Bloomington, IN) used to treat de novo abdominal aortic aneurysms (AAA) in high risk patients with severe aorto-iliac occlusive disease and to salvage bifurcated endografts suffering loss of proximal fixation.
Methods : Nineteen patients (18 men/1 woman, average age 72+8 yrs) were treated with a Renu AUI since Oct 2005 for proximal fixation failure (n=9) due to caudal migration >20 mm(n=2), type IA endoleak(n=1)

or both(n=6) at an average of 57+15 mo following EVAR or for severe aorto-ilio-femoral occlusive disease (n=10) and a narrow calcified aortic bifurcation (ID<15mm, n=3) or disadvantaged proximal neck anatomy (n=3) requiring planned renal origin coverage or renal stenting. Treated patients exhibited high medical risk comorbidities including 7 with oxygen- or steroid-dependent COPD, 6 with severe symptomatic CAD/CHF, and 9 with chronic renal insufficiency (Cr>1.5, 3 with Cr>3.5). AUI device proximal diameters ranged from 22 to 36 mm, contralateral iliac occluder devices were needed in 15 cases (4 chronic occlusions), cross femoral bypasses constructed in all patients, and adjunctive distal iliac stents, iliofemoral endarterectomy, renal or pararenal aortic (Palmaz) stents were required in 11 cases. Five cases were performed under intravascular ultrasound (IVUS) guidance using <30cc contrast dye.
Results : Length of stay (LOS) averaged 8.5+6.8 days with the 5 patients having LOS>7 days suffering acute renal failure post-procedurally (Cr 2x pre-op value and/or dialysis). Other major complications (cardiac,pulmonary,wound,GI) affected 9 patients with 1 death occurring within 60 days. During an average follow-up of 16+11 mo, a single non-AAA related death occurred with no recurrent device migration, device/bypass thrombosis, AAA rupture or endograft explantation. AAA sac regression >5 mm was noted in 8 patients, no size change in 8 cases and 2 patients required secondary treatments for sac expansion and type II leak.
Conclusion : Availability of an AUI device has expanded EVAR to selected high risk patients with severe aorto-iliac occlusive disease and provided a durable option to avoid open conversion in previously treated patients after proximal attachment site failure.

#36 - AORTO-UNILIAC VS BIFURCATED ENDOVASCULAR AORTIC REPAIR: TECHNICAL SUCCESS, SECONDARY INTERVENTION RATE AND QUALITY-ADJUSTED COST ANALYSIS.

Niamh Hynes, MD MRCSI , Sherif Sultan, MD FRCSI EBQS_Vasc

Western Vascular Institute, Galway, Intl. IR
Western Vascular Institute; Galway, Intl. IR

Our endeavour was to contrast clinical and technical outcome of BIF vs AUI in high-risk EVAR patients.

From 2002-2007, 82 high-risk patients underwent elective EVAR (BIF, n=52[63.4%]; AUI, n=30[36.6%]). Mean Age 74yrs (BIFvsAUI, p=0.835), Male% (BIFvsAUI, 86.5%vs76.7%, p=0.260) and Mean Aneurysm Diameter (BIFvsAUI: 5.4cmvs5.3cm, p=0.514).

Predicted probability of receiving AUI was tabulated using multiple logistic regressions to control for SVS co-morbidity and anatomical severity scores and baseline characteristics, creating a pseudo-randomized control design. Primary endpoints were 30-day mortality, 4-year survival and intervention-free survival.

Mean Proximal Endograft diameter was significantly lower with BIF(29.3vs30.9, p=0.031). Mean number of devices used was similar (3.0vs3.4, p=0.165)

BIF and AUI had similar 30-day mortality (1.9%vs0%, p=0.453), 4-year all-cause survival (72.1%vs74.0%, p=0.882, h=0.92 [95%CI=0.30-2.78]) and 4-yr Aneurysm-related Survival (98.1%vs100%, p=0.448).

There was no graft migration, structural failure or intervention required for Type II Endoleak(23.1%vs36.7%, p=0.191). 4-yr Limb thrombosis Rate (7.6% vs 10%, p=0.723) and Intervention-free survival (BIF 89.8% vs AUI 85.9%, p=0.612, h=0.71 [95%CI=0.18-2.76]) were similar. 4 year Fem-Fem crossover patency is 92.6%[95%CI=75.6%-98.6%].

Procedure time, mean blood units and change in eGFR were similar between groups (p>0.05). Length of Stay/HDU (4.2 vs. 7.4 p=0.021/ 0.87 vs. 1.2days, p=0.656) were similarly low, with most patients discharged directly home (BIF vs AUI: 92%vs80%, p=0.103)

Propensity scoring for primary endpoints showed proportions of AUI patients were equal to BIF for all levels of probability and unchanged as the probability of AUI increased.

4 year clinical and technical outcomes were not compromised with AUI compared to BIF in high-risk patients.