

and 1.47 for segments <50% stenosis ( $P < .001$ ). Sensitivity was 0.60, specificity was 0.86, positive predictive value (PPV) was 0.72 and negative predictive value (NPV) was 0.78 for PSV >500 cm/s. Sensitivity was 0.52, specificity was 0.91, PPV was 0.77, and NPV was 0.75 for VR >3.0. Receiver operating characteristic curve discrimination was 0.85 for PSV and 0.84 for VR (Fig), suggesting good ability to classify lesions as hemodynamically significant.

**Conclusions:** Duplex PSV and the VR provide good sensitivity and specificity to distinguish hemodynamically significant lesions in arteriovenous fistulas and grafts. PSV >500 cm/s and VR >3.0 can be used as criteria to interrogate AV access for stenoses by angiography with high specificity for hemodynamically significant lesions.

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#### PS102.

##### Dilation of Ipsilateral Extremity Veins—A Beneficial Effect of Dialysis Access Procedures

Sai Divakaruni, Garima Dosi, Peggy Kidwell, Brajesh K. Lal. University of Maryland School of Medicine, Baltimore, Md

**Objectives:** Several patients are unsuitable for autogenous dialysis access and are assigned to perpetual prosthetic graft placement. We hypothesized that dialysis procedures result in dilation of residual upper extremity (UE) veins not in direct communication with the fistula. Dilation of these veins would have clinical relevance, since some may later become suitable for autogenous accesses. Our aim was to measure the frequency, magnitude, and clinical relevance of this process.

**Methods:** Patients undergoing their first access had duplex ultrasound diameter measurements of cephalic and basilic veins at eight sites (wrist, distal/middle/proximal forearm, cubital fossa, and distal/middle/proximal arm). An optimal vein segment was  $\geq 2.5$ -mm diameter over a  $\geq 10$ -cm length. A fistula was constructed using the best available vein segment, comprising forearm nontransposed ( $n = 9$ ), forearm transposed ( $n = 8$ ), and arm transposed ( $n = 18$ ). Diameters of the ipsilateral basilic and cephalic vein segments that were not used for the fistula were remeasured on follow-up.

**Results:** Of 108 patients who were screened, 71 met inclusion criteria, and 34 completed the study with a follow-up period of 4 to 12 months. The mean diameter of vein segments not used for fistula creation increased by 52%, from  $2.3 \pm 0.5$  to  $3.5 \pm 0.5$  mm ( $P = .01$ ). Two fistulae thrombosed, but new fistulae could be constructed in alternate vein segments that had originally been suboptimal (<2 mm) in diameter. At least one vein segment dilated to  $\geq 2.5$  mm in 54% of our patients and at least one vein segment dilated to  $\geq 3$  mm in 37% of our patients.

**Conclusions:** Dialysis access using one upper extremity vein segment results in progressive dilation of the residual venous segments. In about one-third of patients undergoing surgery for the first time, vein segments

initially deemed suboptimal had dilated to  $\geq 3$  mm. This is especially relevant in patients receiving prosthetic grafts for suboptimal venous anatomy. Our results may impact the Disease Outcomes Quality Initiative guidelines for selection of dialysis access procedures.

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#### PS104.

##### A Pilot Study to Prevent Juxta-Anastomotic AVF Stenosis With Placement of a Viabahn Endograft at the Time of Fistula Creation: The JuxtaBahn Procedure

Oliver Aalami. Stanford University, Stanford, Calif

**Objectives:** End-stage renal disease and the need for dialysis is a growing problem. More than 60% of arteriovenous fistulas are unsuitable for dialysis 5 months after surgery. This early failure rate is due to severe narrowing of the juxta-anastomotic vein segment in 41% to 64% of cases. Trauma to the juxta-anastomotic vein segment during mobilization and turbulent hemodynamic forces are theorized to contribute to the scarring process observed. To prevent juxta-anastomotic stenosis and promote improved maturation rates, we initiated a pilot study placing a covered endograft into the juxta-anastomotic vein segment at the time of AV fistula creation—the JuxtaBahn procedure.

**Methods:** Patients referred for long-term dialysis access placement underwent radiocephalic or brachiocephalic fistula creation. During the standard procedure, a 2 cm or 5 cm Viabahn endograft (6-mm diameter) was placed into the juxta-anastomotic segment of the outflow cephalic vein. The anchoring suture in the heel of the anastomosis went through cephalic vein, endograft, and artery. The remaining hood of the anastomosis was native vein, and the anastomosis was completed in a standard end-to-side fashion. Surveillance ultrasound studies were obtained at 1, 3, 6, and 12 months.

**Results:** The JuxtaBahn AV fistula technique was successfully completed in 11 patients (seven radiocephalic and four brachiocephalic fistulas). Follow-up ranged from 3 to 12 months. No early juxta-anastomotic stenoses were identified. Eighty-two percent of fistulas matured. There were no AV fistula infections. One (9%) AV fistula occluded at 2 weeks (2 mm cephalic vein). One AV fistula (1/11) required ligation.

**Conclusions:** The JuxtaBahn procedure is a viable procedure with no major adverse outcomes. No early juxta-anastomotic stenoses were identified in our pilot study. There is a trend toward higher maturation and lower occlusion rates. A larger prospective, randomized series is required to better evaluate the JuxtaBahn procedure.

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#### PS106.

##### Aneurysm Plication Extends Life of Autologous Dialysis Fistula without Compromising Patency

Hue Thai, Yevgeniy Rits, Donna Bednarski, Jeffrey Rubin. Vascular Surgery, Detroit Medical Center, Detroit, Mich

**Objectives:** The use of a native arteriovenous fistula (AVF) for dialysis is associated with fewer overall complications, and preserving long-term patency is a priority. The purpose of this study is to compare the patency and number of secondary interventions required of AVF when aneurysms are repaired with interposition prosthetic grafting (IG) vs aneurysm plication (PC).

**Methods:** Fourteen patients with symptomatic aneurysms (15) of upper extremity autologous AVFs were treated with PC (eight) and IG (seven) between July 2007 and November 2013 at a single institution. The indications for operation were cutaneous thinning, ulceration, bleeding, and difficulty in cannulation. Patient characteristics, type of repair, patencies, and number of secondary interventions were recorded and analyzed.

**Results:** Fourteen consecutive patients (nine men) with mean age of 48 years, underwent 15 aneurysm repairs. Five patients (33%) had radiocephalic, nine (60%) brachiocephalic, and one (7%) brachiocephalic AVF with the mean follow-up of 9 months. Eight aneurysms (53%) underwent plication vs seven (47%) interposition grafts. The average diameter of the aneurysm was 2.6 cm (IG) and 2.8 cm (PC) (not significant). At 6 months of follow-up, the patency for PC was 62.5% vs 57.1% for the IG group ( $P > .4$ ). One IG was excised due to infection and another was lost due to an unrelated death. Two patients in the PC group were converted to IG due to aneurysm extension. Overall, IG patients required eight times more procedures (five dialysis catheters and three endovascular interventions) vs 1 intervention for the PC group ( $P < .01$ ).

**Conclusions:** Preliminary results show that aneurysm PC extends the life of the native fistula and requires fewer interventions to maintain patency. When possible, this method should be considered as the repair procedure of choice for AVF aneurysms.

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#### PS108.

##### Outcomes Analysis of the Pluripotential Antecubital Vein Dialysis Fistula

Kyle Markel<sup>3</sup>, Marc Webb<sup>1</sup>, Ankur Aggarwal<sup>2</sup>, Graham Long<sup>2</sup>. <sup>1</sup>St. Mary Mercy Hospital, Livonia, Mich; <sup>2</sup>William Beaumont Hospital, Royal Oak, Mich; <sup>3</sup>Wayne State University School of Medicine, Detroit, Mich

**Objectives:** To study the single surgeon outcomes of pluripotential antecubital vein fistulas (PAF) for patients with borderline basilic and cephalic vein diameters.

**Methods:** This is a retrospective analysis of a single surgeon experience with 115 PAFs created from April 2004 to November 2011, using a prospectively maintained patient database. Primary outcome was time to fistula release (TR) for dialysis access. Secondary outcomes were 1-year primary and primary assisted patency. Patient comorbidities were recorded. Borderline veins were defined as diameters 3 to 4 mm. PAF was defined as an arteriovenous fistula in the antecubital fossa with outflow through the upper arm cephalic and basilic veins via the connecting median cubital vein.

**Results:** Of 115 PAFs, 18 (15.7%) were released for dialysis access after the first-stage procedure; a second-stage procedure was required in 82 (71.3%). Forty-nine (59.8%) were converted to basilic vein transposition, and 33 (40.2%) were converted to selective cephalic vein outflow. A total of 84.3% (97 of 115) fistulas were released for use after a mean of  $89 \pm 70$  days after the definitive procedure. Eleven (9.6%) underwent a second index procedure due to thrombosis in (5), failure to mature (3), body habitus (1), diseased outflow vein (1), and ligation secondary to persistent seroma with arm swelling (1). There was one death (0.9%), one who refused second stage procedure (0.9%), and five lost to follow up (4.3%) from PAF creation. One-year follow-up was documented in 68% of patients (66 of 97). Primary 1-year patency was 36.4% (24 of 66); assisted 1-year patency was 100%.

**Conclusions:** PAF is a reasonable strategy that yields an acceptable percentage with a functional dialysis fistula. A substantial fraction will require secondary conversion to single-vein outflow and endovascular intervention to maintain patency in the first year. Further study is indicated with larger cohorts and longer follow-up to corroborate these findings.

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#### PS110.

##### Early Intervention to Salvage Aneurysmal Dialysis Access Arteriovenous Fistula

Payam Salehi, Wande Pratt, Luis A. Sanchez. Section of Vascular Surgery, Washington University, St. Louis, Mo

**Objectives:** Aneurysmal degeneration of arteriovenous fistulas (AVFs) occurs in about one-third of patients on hemodialysis (HD) and can lead to failure of the access. We retrospectively assessed the effectiveness of early surgical intervention to allow continued use of the AVF without the need for a temporary HD catheter.

**Methods:** Over a 3.5-year period, 68 procedures were performed on 50 patients with AVF aneurysms (more than twice the size of the native mature vein) by a single vascular surgeon. Clinical characteristics, symptoms, type of procedure, and patency were evaluated.

**Results:** Indications for surgery included skin breakdown in 53%, infection in 4.5%, and thin/weakened skin over the aneurysm wall in the rest. Sixty-five percent of the AVFs were brachiocephalic, 20% were radiocephalic, and 15% were brachiocephalic. The average aneurysm size was  $2.6 \pm 0.2$  cm with flow rates of  $2231 \pm 250$  mL/min. The repair occurred  $4.8 \pm 0.3$  years after the original AVF creation. Resection and primary anastomosis was performed in 64% of cases and partial resection in 36%. Sixteen patients (32%) had staged procedures for repair of two or more aneurysms. The primary patency rate was 96% at 1 year. Only three patients (4.5%) required a temporary HD catheter (all presented with an infected aneurysm). Two patients developed a hematoma after first HD.

**Conclusions:** Early, and staged if needed, surgical repair by complete or partial resection of AVF aneurysms is a simple and effective strategy to prevent aneurysm-associated complications while avoiding temporary HD