

venography showed compression of the left renal vein outflow by the right iliac artery with a significant gradient. We performed a novel operation in which we transected the left iliac vein and reconstructed it anterior to the left iliac artery to relieve the point of compression.

**Results:** At 6 months of follow-up, the patient's hematuria and left lower quadrant pain had resolved. Surveillance magnetic resonance angiography of the bypass revealed a patent left iliac vein and renal vein with no signs of compression.

**Conclusions:** This is a unique case of nutcracker syndrome occurring in a pelvic kidney. We used a novel surgical technique to reconstruct the iliac vein in a manner that relieved the obstruction. In medium-term follow-up, the reconstruction remains patent and the patient remains symptom-free.

#### A Six-Year Experience with the Proximal Radial Artery Fistula: Does a Previous Access Matter?

Michael F. Amendola,<sup>1</sup> John Pfeifer,<sup>2</sup> Francisco Albuquerque,<sup>3</sup> Mark Levy,<sup>3</sup> Luke Wolfe,<sup>3</sup> Marcela Woogen-Fisher,<sup>2</sup> Ronald Davis.<sup>2</sup> <sup>1</sup>VA Medical Center/Virginia Commonwealth University, <sup>2</sup>VA Medical Center, and <sup>3</sup>Virginia Commonwealth University Medical Center, Richmond, Va

**Introduction:** The proximal radial artery fistula has been established as a viable early surgical option for arteriovenous fistula creation. The overall assisted primary patency reported in the literature approaches 100% at 1 year. We speculate that this excellent assisted primary patency does not represent the functional results when seen in light of successful cannulation and fistula utilization.

**Methods:** We retrospectively queried our Veterans Administration Hospital operative database to identify 284 men who underwent 571 access procedures performed by one senior vascular surgeon attending from January 1, 2003, to December 31, 2008. Operative details, comorbidities, maturation time (time to first cannulation), functional utilization time (successful usage on dialysis), and total duration (creation to occlusion or revision to another type of fistula) were collected and analyzed.

**Results:** During the study period, 144 proximal radial artery fistulas were placed. Eighty-seven patients underwent primary proximal radial artery fistula (P-PRA) placement in a limb without previous access. Fifty-seven patients had a secondary proximal radial artery fistula (S-PRA) after a failed previous fistula or graft in the same limb. There were no differences between the two groups in age, comorbidities, and operative details. Overall assisted primary patency rate of accessed fistulas at 12 months was 79.8%. Ninety-one patients (63.2%) were receiving hemodialysis at the time of P-PRA or S-PRA placement. Outcomes of P-PRA and S-PRA populations on hemodialysis were examined (Table). Subgroup analysis (analysis of variance) of the S-PRA group indicated that a failing previous access in the same arm was not superior in terms of successful cannulation, utilization, or duration compared with a failed previous access.

**Conclusions:** The proximal radial artery fistula remains a viable first-access procedure undertaken at our institution. We have found a similar 12-month assisted primary patency of this fistula type compared with the literature; however, our percentage of fistulas actually being accessed for successful hemodialysis treatment was surprisingly low. The S-PRA appears to have a significantly higher cannulation rate as well as functional and total duration time, most likely secondary to a dilated venous system from previous access. Interestingly, when a previous access was thrombosed or patent, it did not predict successful cannulation, utilization, or total duration of a S-PRA in the same arm at a future date.

Table.

	P-PRA (n = 46)	S-PRA (n = 45)	P
Successful cannulation, No. (%)	15 (33)	25 (55)	.0035 <sup>a</sup>
Maturation time, mean ± SD, days	111.4 ± 59.1	104 ± 95.9	.3212 <sup>b</sup>
Functional utilization, mean ± SD, days	405.4 ± 531.9	755.2 ± 661.2	.0220 <sup>b</sup>
Total duration, mean ± SD, days	516.8 ± 547.2	859.5 ± 650.7	.0361 <sup>b</sup>

<sup>a</sup>Fisher exact test. <sup>b</sup>Wilcoxon rank sum.

#### Fistula Flow Volumes: How Accurate Are They in Predicting Maturity?

William B. Harris, Larry R. Sprouse, Christopher J. Lesar, Heather Mixon, Joel B. Clements, Mark Fugate, Charles S. Joels, Michael S. Greer, Sachin V. Phade, Daniel F. Fisher. University of Tennessee, Chattanooga, Chattanooga, Tenn

**Introduction:** Color duplex ultrasound imaging is one of the primary tools used by clinicians in evaluating arteriovenous fistula (AVF) maturity and suitability for hemodialysis. Classically, flow volume (FV) measurements within the fistula in conjunction with venous diameter and physical examination are the primary determinants of maturation. Many vascular laboratories use FVs of 500 mL/min to confirm AVF adequacy. We estimate this to be a low number and, in fact, a poor predictor of maturation in fistulas at all locations along the upper extremity.

**Methods:** We undertook a retrospective record review of 722 patients in our institution who underwent placement of a new AVF for hemodialysis from 2007 to 2012. Only patients whose FVs were measured 8 to 12 weeks after placement were included in this study, resulting in the exclusion of 434 patients; thus 288 patients were included in the study with 312 total AVFs. Each was rated "matured" or "not-matured" based on clinical evaluation and successful cannulation with two 15-gauge needles for hemodialysis. Flow volumes were determined in each fistula at this stage. Specifically, fistulas with FVs >500 mL/min were evaluated.

**Results:** A total of 233 fistulas were found to have FVs of ≥500 mL/min. Of these, only 99 fistulas (43%) were suitable for hemodialysis at the time of screening. Eighteen of these were radiocephalic fistulas, in which the average FV was 767 mL/min in those mature. Fifty-seven radiocephalic fistulas did not mature, and in these, an average FV of 463 mL/min was noted. Sixty-two of those matured were brachiocephalic fistulas. Average maturation velocities in these were 1353 mL/min. Ninety-four brachiocephalic fistulas did not mature, with an average FV of 984 mL/min. Nineteen brachiocephalic fistulas matured, of which average FV was 1319 mL/min. Fifty-three brachiocephalic fistulas did not mature in the allotted time, and FVs in these averaged 953 mL/min.

**Conclusions:** Utilizing FV to predict the maturity of an AVF for use in hemodialysis is generally not accurate at the traditional cutoff of 500 mL/min. This baseline only predicts maturity a fraction of the time, and in fact, significantly higher FVs may be better predictors of adequate access. These baseline values vary based on location of the conduits used in creation of the AVF in the upper extremity.

#### A Novel Technique to Remove Inferior Vena Cava Filters Using a Homemade Snare Device

Kuldeep Singh, Sean A. Marco, Rajni K. Sandhu. Staten Island University Hospital, Staten Island, NY

**Introduction:** With an increasing use of inferior vena cava (IVC) filters there is an associated higher incidence of filter thrombosis. The need to retrieve these filters is evident. We present a novel way to remove IVC filters using a homemade snare.

**Methods:** A 0.014-inch semi-stiff wire is used. The wire is doubled and a loop is formed. At 2 cm proximal to the loop, the long end of the wire is bent, forming an angle. The loop is brought out through an 8F sheath. The shorter end of the wire is pulled, and the longer end of the wire is advanced, creating a right-angle semi-stiff loop that varies in size with wire manipulation. The sheath and the loop are advanced over the filter. Because of the right angle of the loop and stiffness of the wire, the snare encompasses the entire lumen of the IVC, and capturing the filter hook becomes effortless. Once the loop sits on the filter head the loop is tightened and filter hook is snared, the sheath is then advanced over the filter until the filter is constrained. The filter is then pulled out through the sheath.

**Results:** A total of 14 consecutive filters were retrieved over a course of 8 months. All filters were retrievable type containing a hook at the head of the filter. The average time of filter implementation was 2.2 months, the shortest was 5 weeks, and longest was 13 months. All were retrieved using our homemade snare technique and a 45-cm length 8F Terumo destination sheath. Eight filters were aligned in a straight position, the remaining four had a tilt but no greater than 45°. A preprocedure and postprocedure venacavagram performed in all patients revealed no thrombus in the IVC or the filter and no IVC injury. All filter hooks were easily snared on the first attempt. The cost of a 0.14-inch wire is \$100 compared with \$250 for the least expensive available snare. No complications occurred in the 14 patients.

**Conclusions:** A large number of IVC filters are placed annually with low complication rates; however, physicians should be aware of the devastating outcomes and high mortality rates associated with IVC filter thrombosis. Every effort should be made to retrieve filters once the risk of pulmonary embolism is eliminated. Our novel technique to retrieve filters is efficient, safe, and cost-effective.

#### Utilizing Hybrid Graft in Open Repair of TAAA to Decrease Mesenteric and Renal Ischemia Time

Shadi J. Abu-Halimah. West Virginia University-Charleston Division, Charleston, WV

**Introduction:** Open repair of thoracoabdominal aortic aneurysms (TAAAs) can be associated with significant morbidity and mortality. Mesenteric and renal ischemia is one of the major causes of increased morbidity, and several new techniques to perfuse these organs while clamping show improve outcome. The Gore Hybrid Vascular Graft (HVG; W.L. Gore and Associates, Flagstaff, Ariz) has been used for debranching procedures with good results. This is the first case of using this technology in an open TAAA repair with a main aortic graft and four HVGs to the celiac artery (CA), superior mesenteric artery (SMA), and both renals, with total ischemia time of 30 minutes.