proximal disease. The difference in 24-month patency between women and men (8.9% vs 0.6%, P = .016) and limb salvage rates (87.5% vs 92.9% vs 8.5%, P = .041) than men for tibial lesions with concurrent proximal disease. The difference in 24-month patency between women and men was more pronounced for isolated tibial lesions (50.1% ± 10.1% vs 28.8% ± 10.4%, P = .002). Although the overall complication rates were similar, women had comparatively higher rates of postoperative access site thrombosis than men (10.4% vs 82.9%, P = .043). However, men were more likely to have coronary disease, history of coronary bypass grafting, and chronic renal insufficiency. TransAtlantic Intersociety Consensus distribution, incidence of smoking, and diabetes were equivalent in both sexes. When adjusted for comorbidities, women had higher 24-month primary patency rates (46.0% vs 6.1% vs 30.4% ± 5.9%, P = .016) and limb salvage rates (87.5% ± 4.1% vs 82.9% ± 5.8%, P = .041) for men.

Conclusions: Overall, endovascular interventions below the knee are safe and effective in women and should be considered the first-line modality for the management of critical lower limb occlusive disease. However, further investigation and development of technology to better fit the female anatomy is necessary to improve the gender-related disparity in access site-related complications. Pseudoaneurysms

Our Experience with 140 Visceral Artery Stents: Should Celiac Artery Stenting be Abandoned?

Tyler J. Dahl, BEmE, Christopher L. Stout, MD, William N. Veale, MD, Brian L. Chen, MD, Jarrod D. Day, MD, Cory A. Messerschmidt, BS, and Jean M. Panneton, MD, Eastern Virginia Medical School, Norfolk, Va, USA

Objective: Open bypass is the gold standard treatment for mesenteric ischemia. With the refinement of endovascular therapy, visceral stenting is an attractive minimally invasive alternative but has limited data, and which vessel(s) respond best to stenting has not been addressed. This study compared the outcomes of superior mesenteric artery (SMA) and celiac artery (CA) stenting in elective or emergency conditions.

Methods: All consecutive patients who received visceral stenting between January 2002 and May 2009 were reviewed. Standard statistical analysis, including Kaplan-Meier, was performed. Primary patency was defined as a peak systolic velocity <350 cm/s for the CA and <450 cm/s for the SMA. A stenosis of ≥50% at arteriography was considered a loss of primary patency.

Results: Visceral stents were placed in 140 patients: SMA in 92 (65.7%), CA in 40 (28.6%), and inferior mesenteric artery in 8 (5.8%). There were 29 men (20.7%) and 111 women (79.3%) with a mean age of 72.9 years (range, 20.5-93.9 years). Mean follow-up was 12.8 months. Technical success was 100% for the SMA and 5% for the CA. One-year primary patency was 55% for the SMA and 17% for the CA (P < .0001). Loss of primary patency was associated with ischemic heart disease (P = .05), stent diameter <6 mm (P = .042), and age <50 years (P = .038). These factors did not correlate with loss of primary patency for the SMA.

Conclusions: Visceral stenting has an exceptional technical success rate, with low procedural mortality. Primary patency of the SMA group was significantly higher than that for the CA. Our data suggest that CA stenosis, especially in young patients and those with small vessels, does not respond well to stenting. Therefore, the practice of celiac artery stenting should be abandoned.

Ten-year Experience with Renal Artery In-stent Restenosis

Patrick A. Stone, MD, and Ali F. Aburahma, MD, West Virginia University, Charleston, WV, USA

Objective: Endovascular interventions for symptomatic renal artery stenoses have become the first-line treatment. Limited data are available for the long-term outcome of secondary interventions of recurrent renal artery stenosis after stenting.

Methods: This was a retrospective analysis of a 10-year experience with percutaneous renal artery interventions. Only patients presenting with recurrent symptomatic stenosis were reviewed. End points analyzed included freedom from primary procedures, a decrease in baseline renal function >20%, patency confirmed by duplex imaging, freedom from hemodialysis, and patient survival.

Results: The review included 948 patients with 1150 renal arteries treated; of these, 123 arteries in 108 patients (68.9% women) presented with symptomatic recurrent stenoses, comprising recurrent hypertension in 97% and renal insufficiency in 67%. The average age was 68.9. Mean follow-up was 30 months (range, 1.2-104.7 months) for patency and 56 months (range, 6.2-112.7 months) for creatinine level. Secondary interventions included percutaneous transluminal angioplasty (PTA) only in 27, PTA with cutting balloon in 9, repeat renal artery stenting in 80, and drug-eluting stent (DES) placement in 7. After secondary interventions, 20 of the 123 arteries (16.3%) in 18 patients required tertiary interventions. Freedom from secondary interventions was similar among treatment modalities, with PTA, PTA-cutting balloon, stent, and DES groups having 81.5%, 100%, 83.8%, and 71.4%, respectively, of patients remaining procedure free. Forty patients (37%) had a decrease in renal function >20%, and 24 (22.2%) remained or progressed to renal failure (estimated glomerular filtration rate <30%), and eight ultimately required hemodialysis. Patient survival was 72.8% at 5 years.
Conclusions: Secondary interventions for in-stent restenosis have similar functional results to those seen for the primary intervention. Angioplasty appears to have similar results to secondary stenting.

Differences in Anatomy and Outcomes in Patients Treated with Open Mesenteric Revascularization Before and After the Endovascular Era
Evan Ryer, MD, Gustavo S. Oderich, MD, Thamla A. Macedo, MD, Todd C. Bower, MD, Audra A. Duncan, MD, Joseph J. Ricotta II, MD, Manju Kalra, MBBS, and Peter Gloviczki, MD, Mayo Clinic Rochester, Rochester, Minn, USA

Objectives: Endovascular revascularization (ER) is currently the preferred treatment method in patients with chronic mesenteric ischemia (CMI). The aim of this study was to compare differences in clinical characteristics, anatomy, and outcomes in patients treated with open mesenteric revascularization (OR) before and after the endovascular era.

Methods: Two-hundred and forty-one patients treated for CMI (51% ER; 48.2% OR) between 1998 and 2009 were entered into a prospective database. Since 2002, ER was used in 102 patients (63.8%) and OR in 58 (36.2%) because ER was not possible, or failed, the patient had unfavorable lesions. We reviewed the clinical data and outcomes of patients treated with OR before (group A) and after (group B) the preferential use of ER in 2002. Computed tomography angiography with centerline measurement and conventional angiography were used to assess differences in anatomy.

Results: OR was used to treat 58 patients in group A and 58 in group B. Both groups had similar demographics, risk factors, and clinical presentation, with the exception of more (P < .05) cardiac interventions, dysphagia, abdominal pain, and food fear in group B. Patients in group B had more extensive disease, including more superior mesenteric artery (SMA) occlusion (45% vs 67%, P = .02). There were no differences in operative mortality (1.7% vs 3.4%), complications (43% vs 53%), and length of stay (both 12 ± 1 days) for group A and B, respectively (P = NS). Symptom improvement was noted in 88% of group A patients and in 86% of group B patients (P = NS). Mean follow-up was 56 ± 7 months in group A and 22 ± 3 months in group B (P = .01). At 1 year, there were no differences in patient and renal recurrence rates between groups.

Conclusions: Open mesenteric revascularization is currently indicated in about 36% of patients with CMI. Despite the presence of more extensive mesenteric disease in patients currently treated with OR, outcomes have not changed compared with those achieved before the preferential use of mesenteric stents.

Hemodialysis Reliable Outflow (HeRO) Catheter Outcomes in Patients with Long-standing Renal Failure: Optimizing Performance
Jarrod D. Day, MD, Harry R. Holt, MD, Brian L. Chen, MD, Christopher L. Stout, MD, Jean M. Panneton, MD, and Marc H. Glickman, MD, Eastern Virginia Medical School, Richmond, Va, USA

Objectives: Owing to the increasing population of access-challenged dialysis patients, the Hemodialysis Reliable Outflow (HeRO) device is becoming a more recognized alternative option for patients who have a tunneled dialysis catheter (TDC). We have developed criteria and risk factors that we hope will improve patency, reduce infection, and ultimately improve the performance of the HeRO device in this high-risk population.

Methods: All HeRO implants from May 2008 through June 2009 at a single institution were retrospectively reviewed. Patient demographics, history, and implant success were evaluated. Cephalosporin was the preferred prophylactic antibiotic. Primary outcomes were successful implantation, patency, any infections, and death. Secondary outcomes were mean time to follow-up of 4.1 months. Device thrombosis was less likely to develop in patients taking Plavix (0% vs 32.5%, P = .025). The number of prior access procedures (>5) was associated with device thrombosis (2.5% vs 45%, P = .005) and device-related infection (9% vs 26.3%, P = .021). The 30-day mortality was 13% (n = 5), which was not related to the procedure. Overall 1-year survival was 72.5%.

Conclusions: In this high-risk patient population, the HeRO device can be placed successfully, with low morbidity. Factors that may optimize performance include the postoperative use of Plavix, use of the device earlier in traditional dialysis-access algorithms, and possibly, the perioperative administration of broad-spectrum antibiotics.