Conclusions: Overall, EH for infrainguinal arterial bypass confers no additional benefit in wound complication or bypass patency rates compared with OH. However, the possibility that bypass patency may be enhanced by EH in the nonhemodialysis population deserves further study.

Outpatient Common Femoral Artery Stenting: Midterm Outcomes

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Objective: Stenting of common femoral artery (CFA) lesions is controversial. The purpose of this study was to demonstrate the safety, efficacy, and midterm outcomes of CFA stenting.

Methods: From January 2009 to December 2011, 61 patients, 29 men (48%) and 32 women, underwent CFA stenting in our outpatient office angiosuite. Patients were a mean age of 67.28 ± 9.85 years. The most common comorbidities were hypertension (91.8%), smoking (59%), hyperlipidemia (59%), and diabetes (39.34%). Indications for the procedure were moderate claudication (4.35%), severe claudication (50.72%), ischemic rest pain (37.68%), and nonhealing ulcer (7.25%). We retrospectively analyzed the outcomes of 69 CFA lesions by evaluating clinical improvement and patency.

Results: Follow-up for clinical improvement showed 30 patients (44.12%) achieved the "markedly improved" Rutherford classification, 14 (20.59%) were "moderately improved," and the condition worsened in seven (10.29%). The cumulative primary patency rate was 94% at 3 months, 82% at 6 months, 71% at 9 months, and 67% at 12 months, remaining the same over 24 months. Cumulative primary assisted patency was 100% at 21 months. Thirteen cases (19%) were considered as failures. Concomitant vascular stenting in other vessels was performed in 58 patients (83.82%). The only postoperative complication was a groin hematoma in one patient (1.47%). Twenty stents (29.41%) subsequently were punctured, without complications, to achieve access for other endovascular procedures.

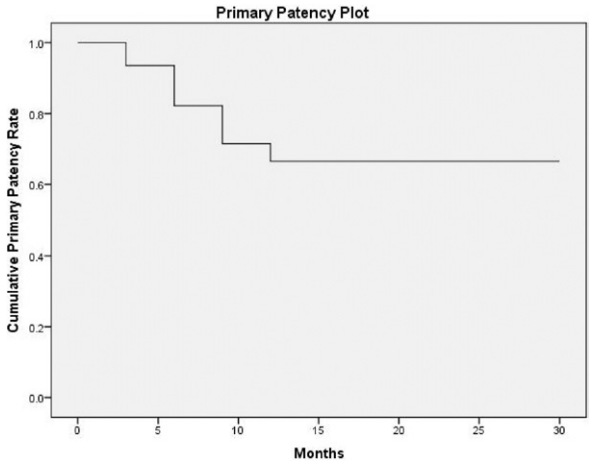

Fig.

Conclusions: Stenting of CFA lesions with self-expandable stents is safe and effective in the outpatient office setting. Puncturing the CFA stent for subsequent endovascular access is also safe and effective.

Clinical Consequence of Bare-Metal Stent and Stent Graft Failure in Femoropopliteal Occlusive Disease

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Objective: The optimal role for bare-metal stents (BMS) and stent grafts (SG) in treating femoropopliteal occlusive disease (FPOD) is as yet undefined. Understanding the clinical consequences of failure can help guide initial treatment decisions. The goal of this study was to define the nature and frequency of adverse clinical events related to BMS and SG failure in FPOD.

Methods: This is a single-institution retrospective review of the primary endovascular intervention for FPOD, treated with BMS or SG, from September 2007 through October 2011. Patient demographics, indications

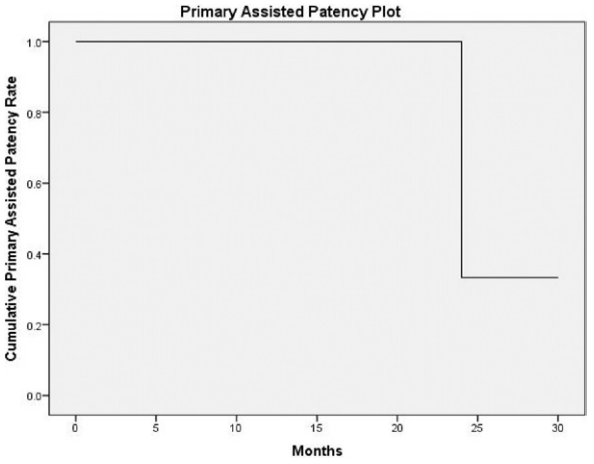

Fig.

for intervention, anatomic characteristics, procedural details, clinical outcomes, and reintervention details were reviewed. Patients were excluded if they had any previous lower extremity interventions or inadequate follow-up.

Results: Of the 127 limbs from 97 patients that met the inclusion criteria, 67 were treated with BMS and 60 with SG. Follow-up averaged 551 days for BMS and 690 days SG. The indication for intervention was similar between groups (49% vs 68% claudication; $P = .15$). Baseline patient characteristics were similar between groups, with the exception of more TransAtlantic Inter-Society Consensus (TASC) D lesions (9 of 67 vs 26 of 60, $P < .01$) and chronic total occlusion (18 of 67 vs 35 of 60; $P < .01$) in the SG group. Freedom from reintervention of the index procedure was more likely with SG (28 of 67 vs 40 of 60, $P < .01$). For both groups, the indications for reintervention of the index procedure were prompted by changes in symptoms or physical examination findings rather than by abnormal findings on surveillance ultrasound imaging (9 of 39 vs 3 of 20). Only patients in the SG group presented with acute limb ischemia (0 vs 6, $P < .01$); however, the major adverse limb event rate was not different between groups (11 vs 10, $P = .9$). The 127 limbs needed 96 primary and secondary interventions during the course of the study. Including both primary and secondary interventions, only patients treated with SG presented with acute limb ischemia (0 vs 11, $P < .1$).

Conclusions: Reinterventions are common in both groups; however, SG failure is more likely to present with acute limb ischemia than BMS failure. These observations should be carefully considered when treating FPOD with BMS or SG.

Surgical Treatment of Lower Extremity Venous Aneurysms

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Objective: Lower extremity venous aneurysms are rare. Their symptoms, diagnosis, and treatment are varied. The purpose of this study was to review our contemporary experience in managing these unusual entities and define the treatment options.

Methods: A retrospective review from 1994 to 2011 was conducted at three geographically separate institutions. Basic demographics, diagnostic workup, treatment, and follow-up were reviewed.

Results: The review included 14 patients with lower extremity venous aneurysms. There were four male patients (29%) and 10 female patients (71%), with a mean age of 46 years (range 14-74 years). The 14 aneurysms consisted of seven popliteal vein (50%), three great saphenous vein (21%), two small saphenous vein (14%), one common femoral vein (FV) (7%), and one FV (7%). Symptoms that led to the diagnosis were pain (n = 6, 43%), deep vein thrombosis (DVT; n = 4, 29%), palpable mass (n = 2, 14%), aneurysm rupture (n = 1, 7%), and knee injury (n = 1, 7%). Inferior vena cava filters were placed preoperatively in two patients with pulmonary embolism from popliteal DVT. The five patients with great/small saphenous vein aneurysms underwent excision. The 10 patients with popliteal, FV, or common FV aneurysms underwent aneurysmectomy with venorrhaphy (n = 4), aneurysmectomy with interposition saphenous vein graft (n = 4), or aneurysm excision with end-to-side anastomosis to the great saphenous vein (FV, n = 1). Surgical complications included three (21%) hematomas requiring surgical evacuation, two (14%) postoperative thromboses requir-

ing anticoagulation, and two patients (14%) with postoperative edema. Eight of nine patients (89%) with venous reconstruction underwent imaging at a mean of 292 days postoperatively. All reconstructions were patent. There have been no recurrences to date after a mean follow-up of 483 days (range, 6-3800 days). All patients with PE were anticoagulated for 6 months, and those with DVT were anticoagulated for 3 to 6 months.

Conclusions: Lower extremity venous aneurysms are infrequently encountered and most often present with symptoms of pain or DVT. Rupture is rare but possible. Popliteal and saphenous vein aneurysms can present with DVT. Surgical options vary depending on aneurysm location and need for maintenance of vessel patency.

Factors Impacting Follow-Up Care After Placement of Temporary Inferior Vena Cava Filters

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Objective: Rates of inferior vena cava filter (IVCF) retrieval have remained suboptimal, partly because of poor follow-up. The goal of our study was to determine demographic and clinical factors predictive of IVCF follow-up care in a university hospital setting.

Methods: We reviewed 250 consecutive IVCFs placed with the intention of subsequent retrieval between March 2009 and October 2010. Patient demographics, clinical factors, and physician specialty were evaluated. Multivariate logistic regression analysis was performed to identify variables predicting follow-up care.

Results: Of our cohort, 54% received follow-up care, and the IVCF was retrieved in 95%. Major indications for IVCF placement included prophylaxis for high-risk surgery (49%) and venous thromboembolic event with contraindication or failure of anticoagulation (42%), or both. Follow-up care was less likely for patients discharged to acute rehabilitation or skilled nursing facilities ($P < .001$), those with central nervous system pathology (eg, cerebral hemorrhage or spinal fracture; $P < .001$), and those whose IVCF was not placed by a vascular surgeon ($P < .001$). In a multivariant analysis, discharge home (odds ratio [OR], 4.0; 95% confidence interval [CI], 1.99-8.2; $P < .001$), central nervous system pathology (OR, 0.46; 95% CI, 0.22-0.95; $P = .036$), and IVCF placement by the vascular surgery service (OR, 4.7; 95% CI, 2.3-4.9; $P < .001$) remained independent predictors of follow-up care. Trauma status and distance of residence did not significantly affect patient follow-up.

Conclusions: Service-dependent practice paradigms play a critical role in patient follow-up and IVCF retrieval rates. Nevertheless, specific patient populations are more prone to having poorer rates of follow-up. Such trends should be factored into institutional quality control goals and patient-directed care.

The Efficacy of a Shortened Duration of Propranolol Therapy in the Treatment of Infantile Hemangioma

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Objective: Propranolol has been shown to be an effective treatment for symptomatic hemangioma of infancy. Current treatment regimens extend the duration of therapy from initial dosing until the patient reaches the age of 12 months. Unfortunately, the side effects from treatment are common and often extend throughout the duration of treatment. Our goal is to determine if shortening the duration of treatment will be effective in managing infantile hemangioma.

Methods: All patients aged <13 months who presented to a multidisciplinary vascular anomalies center with a diagnosis of infantile hemangioma during an 18-month period were prospectively treated with a shortened duration of therapy using oral propranolol. Patients were treated for 16 to 20 weeks. If the hemangioma remained evident at the 16- or 20-week check, therapy was continued until the hemangioma was no longer evident.

Results: Forty-nine patients (33 girls and 16 boys) were treated. The average age at onset of treatment was 14 weeks (range, 3-56 weeks). Average duration of treatment was 23 weeks (range, 8-56 weeks). Treatment in 23 patients extended >20 weeks because of failure of hemangioma resolution. Nine of the 49 patients (18%) developed recurrences. Four of the recurrences occurred in 26 patients (15%) treated for ≤20 weeks. All of these patients responded to a second course of treatment extended to the patient reaching age 12 months. Three patients (6%) ultimately did not respond to propranolol treatment.

Conclusions: This study once again demonstrates the effectiveness of propranolol in the treatment of infantile hemangioma. In addition, a shortened duration of treatment, <20 weeks of therapy, is effective in patients whose hemangiomas clinically resolve during that period. The recurrence rate for these patients is low. Those patients that do recur respond well to a second course of treatment. Shortening the course of treatment in these patients minimizes the effect of the side effects from propranolol.

Geometric Changes of the Inferior Vena Cava in Trauma Patients Undergoing Volume Resuscitation: Insight into Dynamic Stresses Placed on Inferior Vena Cava Filters

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Objective: Dynamic changes in the anatomic geometry of the inferior vena cava (IVC) from changes in intravascular volume status may cause passive stresses on IVC filters. This study quantified the variability in IVC dimensions and anatomic orientation as influenced by intravascular volume changes to determine how it may affect complications of IVC filter placement including migration, tilting, and perforation.

Methods: Retrospective computed tomography (CT) measurements of major and minor axis along with horizontal diameter of the IVC at 1 and 5 cm below the lowest renal veins (RVs) were assessed in 58 adult trauma patients in hypovolemic and postresuscitative states. IVC perimeter area and volumetric measurements were calculated and correlated with caval orientation.

Results: The mean volumes of the IVC segment were 9.34 mL on the initial CT scan and 11.52 mL on follow-up CT scans, with a mean increase of 51.5% ($P < .01$). At 1 and 5 cm below the RVs, the IVC expanded anisotropically, with the minor axis expanding by an average of 53.3% ($P < .001$) and 31.3% ($P < .01$), respectively, whereas the major axis only changed by 4.9% ($P = .15$) and 6.8% ($P = .025$). Surface area and perimeter at 1 cm below the lowest RV expanded by 67.5% ($P < .001$) and 11.2% ($P < .01$). At 5 cm below, the expansion of surface area and perimeter was 44.2% ($P < .01$) and 11.4% ($P < .001$). The IVC orientation was left anterior-oblique in all patients. Horizontal measurement significantly underestimated the IVC maximal diameter. With hypovolemia, at 1 and 5 cm below the lowest RV, the discrepancies between the horizontal and major axis diameters were 2.60 ± 1.27 mm ($P < .001$) and 2.13 ± 1.35 mm ($P < .001$), respectively, whereas the postresuscitation CT showed the same underestimation at 1 and 5 cm below the lowest RV, at 2.56 ± 1.25 mm ($P < .01$) and 2.38 ± 1.15 mm ($P < .01$), respectively.

Conclusions: There is significant anisotropic variability of the infrarenal IVC geometry, with significantly greater expansive and compressive forces in the minor axis. There can be significant volumetric changes in the IVC with associated perimeter changes, but the left anterior-oblique caval configuration is always maintained. These significant dynamic forces are likely to affect IVC filter stability after implantation. The consistent obliquity may lead to underestimation of the IVC diameter used in anteroposterior venography and may influence initial filter selection.

Congenital, Meandering Transdiaphragmatic Aortocaval-Right Atrial Arteriovenous Fistula

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Objective: We present a unique case of a high-flow, congenital, aortocaval-right atrial arteriovenous vascular anomaly that remained undetected until late adulthood. The patient is 66-year-old white woman with chronic, intractable rate-controlled atrial fibrillation who presented with a chief complaint of new-onset, nonfocal abdominal pain and fatigue.

Methods: A computed tomography angiogram demonstrated a large, tortuous, arterial conduit that originated in the paravisceral abdominal aorta just above the right native renal artery, traversed through the right hemidiaphragm, and emptied into the suprahepatic inferior vena cava near its insertion into the right atrium. The vessel was further evaluated with gadolinium-enhanced three-dimensional magnetic resonance angiography, which measured the anomalous vessel to be 11 mm at its aortic origin; averaging 10 mm throughout its course, with focal aneurysmal dilatation to 17 mm at the focus of emptying into the inferior vena cava. Time-resolved magnetic resonance angiography demonstrated 2.2 L/min flow through the fistula, with a Qp/Qs ratio of 1.2. Chest radiography and echocardiography demonstrated marked cardiomegaly. Owing to the high-flow nature of the vessel and associated symptoms, percutaneous transaortic and transcaval arteriovenous fistulography was performed. Test balloon occlusion of the conduit did not result in any adverse hemodynamic changes. The conduit was occluded with endovascular Amplatzer Vascular Plugs, resulting in complete cessation of blood flow.