

75% of program directors support development of a national policy, and 81% would incorporate it into their program.

Conclusions: There is compelling interest to establish radiation safety guidelines for the pregnant trainee or vascular surgeon. Consideration should be given at the Society leadership level to develop and support radiation safety guidelines for all vascular surgeons.

Antibiotic-Loaded Polymethylmethacrylate Beads for the Treatment of Extracavitary Prosthetic Vascular Graft Infections: Revisited

Patrick A. Stone, MD, Daniel Dearing, Ali Aburahma, West Virginia University, Charleston, WV

Objective(s): This study was conducted to further assess the efficacy of antibiotic-loaded polymethylmethacrylate (PMMA) beads in the treatment of lower extremity prosthetic arterial bypass infections.

Methods: This was a retrospective review of all patients with lower extremity vascular surgery site (VSS) infections involving lower extremity bypasses treated with antibiotic-loaded PMMA beads and culture-specific parenteral antibiotics during a 4.5-year period. Patient demographics, comorbidities, site of initial graft infection, initial and additional surgical debridements, wound culture results, type of antibiotic beads implanted, and graft treatment strategy were evaluated. Primary outcome measures included mortality, recurrent infection, and limb salvage.

Results: A total of 44 lower extremity VSS infections developed in 42 patients, with a treatment algorithm including the use of antibiotic-impregnated PMMA beads. These included 12 aortoiliac-femoral bypasses, 23 infrainguinal bypasses, and 6 extra-anatomic bypasses, and 3 patients with combined inflow/outflow bypass procedures with groin infection. Cultures isolated 60 pathogens, (35 gram-positive, 23 gram-negative) with methicillin-resistant *Staphylococcus aureus* (MRSA) cultured from 11 wounds (18.3%), and 4 (8.9%) patients had no growth despite clinical signs of infections. Vancomycin beads were initially placed in all patients, with selective addition of gentamycin to the PMMA beads. Repeat VSS exploration and culture results led to an average of 1.3 bead replacements before definitive treatment. Treatment strategy included graft preservation in 28 patients (63.6%), partial graft excision with in situ replacement in 10 (22.7%), and total graft excision in 6 (13.6%). Sartorius muscle flap was performed in 15 patients (34.1%). Perioperative mortality was 2.4%. At a median follow-up of 22 months, the limb salvage rate was 79% and the recurrent infection rate was 9.0%.

Conclusions: Antibiotic-loaded PMMA beads serve as adjunct in the management of VSS infections and expand treatment options for graft preservation or in situ reconstructions, with low rates of recurrent infections. Further experience with this adjunct may help elucidate its role in the management of this complicated problem.

Concurrent Prophylactic Placement of Inferior Vena Cava Filter in Gastric Bypass and Adjustable Banding Operations: An Analysis of the Bariatric Outcomes Longitudinal Database (BOLD)

Wei Li, MD, MPH¹ Piotr Gorecki, MD,² Robert Autin, MD,² William Briggs, PhD,² Elic Semaan, MD,² Massrcus D'Ayala, MD,² ¹New York Methodist Hospital, Brooklyn, NY; ²New York Methodist Hospital, Brooklyn, NY

Objective(s): Postoperative pulmonary embolism (PE) is a leading cause of death after bariatric surgery. The concurrent prophylactic placement of an inferior vena cava filter (CPPOIVCF) in patients undergoing bariatric operations remains controversial. This study used the Bariatric Outcomes Longitudinal Database (BOLD) to determine associated characters and outcomes of CPPOIVCF for patients undergoing gastric bypass (GB) and adjustable banding (AB) surgeries.

Methods: We analyzed BOLD, a prospective database of bariatric surgery patient information. GB and AB operations were categorized into open and laparoscopic approaches. Univariate logistic regressions were used to compare between non-CPPOIVCF and CPPOIVCF groups.

Results: We identified 322 CPPOIVCF (0.33%) from 97218 GB and AB operations performed between 2007 and 2010. Significant differences were identified in the categories of male sex (21.1% vs 31.4%; $P < .001$), preoperative body mass index (44.5 ± 6.6 vs 45.3 ± 7 kg/m², $P < .001$), and African American race (10.5% vs 18%, $P < .001$) between non-CPPOIVCF and CPPOIVCF groups. The CPPOIVCF group had more patients with previous nonbariatric surgery (50% vs 43.6%, $P = .02$), a history of venous thromboembolism (21.4% vs 3.1%, $P < .001$), impairment of functional status (7.8% vs 3.1%, $P < .001$), lower extremity edema (47.2% vs 27.1%, $P < .001$), obesity hypoventilation syndrome (7.1% vs 2.1%, $P < .001$), obstructive sleep apnea syndrome (58.1% vs 43.3%, $P < .001$), and pulmonary hypertension (13% vs 4.1%, $P < .001$). Patients in the CPPOIVCF group were more likely to receive GB than AB (77% vs 58.1%, $P < .001$) and an open surgical approach (21.4% vs 4.8%, $P < .001$). Operative duration was longer in the CPPOIVCF group (119 ± 67 vs 89 ± 52 minutes, $P < .001$). The CPPOIVCF group also had a longer hospital LOS (3 ± 2 vs 2 ± 6 days, $P = .048$), was associated with higher incidence of deep

vein thrombosis (0.93% vs 0.12%, $P < .001$), and a higher mortality (0.31% vs 0.03%, $P = .003$) from PE and indeterminate causes.

Conclusions: CPPOIVCF was associated with specific clinical features, increased health care resource utilization, and a higher mortality in patients undergoing bariatric operations. This study was unable to establish an outcome benefit for CPPOIVCF.

A "Fall-Back" Technique for Difficult Inferior Vena Cava Filter Retrieval

Paul J. Foley, MD, Derek P. Nathan, MD, Grace J. Wang, MD, Edward Y. Woo, MD, S.W. Stavropolous, MD, Richard D. Shlansky-Goldberg, MD, Ronald M. Fairman, MD, Benjamin M. Jackson, MD, Hospital of the University of Pennsylvania, Philadelphia, Pa

Objective(s): This study describes the results of a novel technique for inferior vena cava filter (IVCF) retrieval when the retrieval hook cannot be snared, for example, because it is embedded in the caval wall.

Methods: A retrospective review of all patients undergoing attempted IVCF retrieval by a single surgeon between March 2009 and March 2011 was undertaken. After December 2009, in cases where the hook could not be snared, an 18F 85-cm sheath was inserted into the internal jugular vein and a Bentson wire and snare were advanced across separate interstices of the filter. The resulting "lasso" was pulled up below the collar at the top of the filter, and the filter collapsed into the sheath, as in the Fig.

Results: Over 24 months, 28 patients (17 women) underwent attempted retrieval of Günther Tulip® filters. Patients were 44 ± 14 years old. Filters were placed for venous thromboembolism with contraindication to anticoagulation in 7 patients and prophylactically in 21. Of the prophylactic cases, 15 (71%) were placed before planned bariatric surgery. Before December 2009, the success rate was 86% (6 of 7): the retrieval hook of one filter could not be snared and appeared to be embedded in the wall of the cava. After adoption of the novel technique, the success rate was 95% (20 of 21): one patient refused further attempts at central venous catheterization after multiple unsuccessful attempts. Durations of filter implantation were 4.5 ± 3.3 months for filters retrieved conventionally by snaring the hook and 12.8 ± 10.7 months ($P = .02$) for 10 that were retrieved using the new technique. All patients were discharged on the day of the procedure. The patient in whom the retrieval hook could not be snared before December 2009 refused another attempt at retrieval.

Conclusions: A novel method of IVCF retrieval was successful in every instance in which it was attempted. It was associated with no morbidity despite the customary use of an 18F sheath in the internal jugular vein. The approach constitutes an appropriate "fall-back" technique when the retrieval hook of a removable IVCF cannot be snared.

Distal Bypass in the Endovascular-First Era: Is There Still a Need for Open Surgery?

R. Clement Darling, III, MD, Manish Mehta, MD, MPH, Sean P. Roddy, MD, Benjamin B. Chang, MD, Paul B. Kremenberg, MD, Philip S.K. Paty, MD, Kathleen J. Ozsvath, MD, John Taggart, MD, Yaron Sternbach, MD, Dhiraj M. Shah, MD Albany Medical College, Albany, NY

Objective(s): Like most we have adopted an aggressive endovascular approach and reserve bypass surgery only for lesions that cannot be crossed or are deemed anatomically unsuitable for catheter-based therapy. This report details our results with open infrainguinal reconstruction for patients who are not suitable for endovascular intervention.

Methods: All patients presenting with claudication or critical limb ischemia (CLI), including rest pain, nonhealing ulcer, and gangrene, were prospectively entered into our vascular registry. Inflow, outflow, conduit, revisions, morbidity, and death were measured and evaluated. During this same period, patients treated with endovascular methods were also evaluated.

Results: From 2008 to 2010, 1316 bypasses were performed: 231 for claudication and 1085 for CLI (35% for rest pain, 39% for nonhealing ulcer, and 26% for gangrene). The 30-day operative mortality for the total group was 31 (2.86%). There was no operative mortality for patients presenting with claudication and 2.86% ($n = 31$) for those patients presenting for CLI. Immediate limb loss was 0 in the claudication patients, but occurred in 20 (1.84%) in the CLI patients. At 30 days, 1 year, and 2 years, respectively, limb preservation was 100%: 99.6% in the claudication group, and 97%, 94%, and 93%, respectively, for the CLI group. In the endovascular group there was no periprocedural deaths, 15% required secondary procedures, 14% for claudication and 17% for CLI ($P = NS$).

Conclusions: A balanced approach of distal reconstruction is still necessary to promote optimal mortality, morbidity, short-term patency, and limb salvage for patients with significant infrainguinal disease.