

## **Impact of Splenic Embolization Technique on Post-embolization Complications: A single Institutional Review**

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### **Background:**

Splenic embolization has proven to be a successful treatment for nonoperative management of splenic injuries and is now considered the standard of care in a hemodynamically stable patient. However, despite the increase in splenic preservation, embolization carries risks including rebleeding, pseudocyst formation, and more commonly, abscess formation. Although splenic embolization is increasing in frequency, the exact technique, including location and materials utilized, has not yet been standardized. At our institution, it is at the discretion of the interventional radiologists which technique to use while embolizing the splenic vessels.

### **Hypothesis:**

Our institution saw an increase in the number of readmissions for infections after splenic embolization. We hypothesized that the use of gel foam for splenic embolization lead to a greater number of complications including splenic abscesses, pleural effusions, readmission and failure of non-operative management requiring splenectomy.

### **Methods:**

We retrospectively reviewed the Lahey Hospital and Medical Center Trauma Database for all splenic injuries from 2016 to present, including all patients who underwent splenic embolization during their initial admission. Patients who proceeded immediately to splenectomy were excluded. The mechanism, injury grade, number of blood transfusions, and embolization technique were included in the analysis. Our primary outcome was postembolization complications including abscess requiring percutaneous drainage, pleural effusion requiring thoracentesis, and readmission.

### **Results:**

21 patients underwent embolization for traumatic splenic injuries from 2016 until present. The study population was predominantly male and 95% were blunt traumatic injuries. Splenic injury ranged from grade II (9.5%), III (33.3%), IV (47.6%) and V (9.5%) based on AAST grading. Patients were embolized with either coils alone (9, 42.9%), gel foam alone (6, 28.6%) or gel foam and coils (6, 28.6%). For the nine patients who underwent embolization with coils alone, there were no readmissions, splenic abscesses nor pleural effusions requiring intervention. Twelve patients underwent embolization with gel foam either in combination with coils or alone. Complications in this group included seven readmissions (58%), four patients with a pleural effusion requiring thoracentesis (33.3%) and seven patients with a splenic abscess requiring drainage (33.3%). Three patients (33.3%) who developed splenic abscesses required splenectomy for infectious complications. There were no splenectomies for rebleeding in either group.

### **Conclusions:**

While splenic embolization for traumatic splenic injury in the hemodynamically stable patient has become standard of care, the use of gel foam at our institution lead to an

increased rate of readmission, abscesses and splenectomy when compared to coils alone.

### **Microflora of wounds sustained in bear attacks**

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#### **Background:**

The microflora of bear bites have been described in several studies and have been found to be variable and polymicrobial.<sup>[1],[2]</sup> One study interestingly found a novel bacteria which was named *Streptococcus ursoris*<sup>[3]</sup>. Bacteria identified in bear bite wound cultures include *Escherichia* species, *Citrobacter* species, *Streptococcus sanguis* and *constellatus*, *Micrococcus* species, *Neisseria sicca*, *Mycobacterium fortuitum*, *Serratia fonticola* and *marcescens*, *Aeromonas hydrophila*, *Enterococcus durans*, *Klebsiella oxytoca*, *Micrococcus luteus*, *Peptostreptococcus prevotii*, and *Porphyromonas gingivalis*, among others.<sup>[1],[4],[5],[6]</sup>

#### **Hypothesis:**

The microflora of grizzly bear attacks would likely be polymicrobial and would be similar within the literature.

#### **Methods:**

A 59-year-old male hunter was attacked by a grizzly bear in Wyoming and sustained multiple injuries, most significant to his face, neck, and arms. On hospital admission he was started on vancomycin, piperacillin/tazobactam (Zosyn), and doxycycline to cover grizzly bear mouth flora. Tissue cultures grew *Enterococcus faecalis* and *Pseudomonas aeruginosa*, as well as *Proteus penneri* from his right arm flap. Infectious disease was consulted due to ongoing fevers and a leukocytosis and Zosyn was replaced with meropenem and clindamycin.

#### **Results:**

Both *E. faecalis* and *P. penneri* which grew from tissue cultures were not commonly noted in the literature.

#### **Conclusions:**

It is always important to take cultures with bear bites as the flora are broad, polymicrobial, and relatively unpredictable.

### **Morganella septicemia secondary to a necrotizing soft tissue infection**

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#### **Background:**

Introduction: *Morganella Morganii* is a ubiquitous gram-negative anaerobe but an infrequent surgical pathogen. Case reports document morganella bacteremia secondary to urinary, biliary, or surgical site infections in immunocompromised patients.<sup>1</sup> We

present a patient with fulminant infection following a peripheral angioplasty and toe amputation.

### **Results:**

Case: A 71 year old male with a history of coronary bypass graft, aortic valve replacement, failed renal transplant on hemodialysis, stroke, type 2 diabetes, and peripheral vascular disease status post right femoral popliteal bypass presented with new onset right leg pain one week following ipsilateral angioplasty and second toe amputation. The patient was afebrile with stable vital signs and a LRINEC score of 3. The right leg was well perfused with patchy bruising and was tender without crepitus. Computed tomography showed soft tissue edema without gas. Blood cultures were obtained, he was started on Vancomycin/Zosyn and admitted to the intensive care unit. Within six hours he developed hemorrhagic bullae and hypotension and was taken to the operating room for circumferential debridement of his right lower extremity. Following debridement he was awake and alert but his condition deteriorated despite intensive treatment. Preliminary blood cultures grew gram-negative rods in both bottles. Due to a rapid decline the patient was transitioned to comfort measures and died 10 hours following debridement. Post-mortem blood cultures returned positive for *Morganella Morganii* and intraoperative cultures grew rare colonies of the same. Although the toe amputation site showed no signs of infection, this is the most likely portal of entry - the *Morganella* spread proximally via lymphatics to the calf and entered the blood stream in an immunocompromised patient.

### **Conclusions:**

Discussion: *M. Morganii* infections are frequently associated with the urinary tract or biliary system and are infrequent nosocomial pathogens. These infections rarely induce aggressive soft tissue infections or bacteremia and mortality can approach 40% when present.<sup>2</sup> Delay in diagnosis is the norm. Risk factors include advanced age, diabetes, immunosuppression, underlying disease, and recent hospitalization.<sup>4</sup> Typical treatment is with a third generation cephalosporin, though due to drug resistance a carbapenem or aminoglycoside may be added.<sup>5</sup> A high degree of suspicion, broad spectrum antibiotics, and surgical intervention based on frequent exam are critical in treatment.

## **Q Fever Masquerading as Legionellosis in an Endovascular Stent Infection**

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### **Background:**

Legionellosis in the setting of pre-existing endovascular hardware may represent *Coxiella burnetii* infection, as antibody cross-reactivity exists.

### **Hypothesis:**

Persistent constitutional symptoms in the setting of an EVAR should require expanded investigation of *Coxiella burnetii* (Q fever) when testing is positive for Legionellosis.

### **Methods:**

We present a 63-year-old male status-post EVAR with a history of ankylosing spondylitis, COPD, asthma, CAD with myocardial infarction, HTN, HLD who presented with persistent constitutional symptoms and Legionellosis by urine antigen testing.

**Results:**

He completed a 21-day course of azithromycin for Legionella. His leukocytosis and liver function tests normalized but he had continued lethargy and a persistently elevated ESR and CRP. Imaging showed a radiographically infected EVAR graft (placed 10 months prior). The EVAR was explanted and pathology revealed *Coxiella burnetii*. Prolonged hydroxychloroquine and doxycycline therapy were required for vascular manifestations of *Coxiella* as azithromycin (usual treatment for Legionellosis) provides inappropriate coverage.

**Conclusions:**

Persistent constitutional symptoms in the setting of an EVAR requires expanded investigation, especially in the setting of Legionellosis.

**Rhino-orbital-cerebral Mucormycosis infection in an immunocompetent patient after motorcycle accident**

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**Background:**

Post-traumatic rhino-orbital-cerebral Mucormycosis infection in an immunocompetent patient is exceedingly rare. Early recognition and diagnosis are required to allow for timely intervention to increase survival benefit. Diagnosis can be difficult and requires a high index of suspicion. Once infection spreads mortality approaches 90%. Prompt initiation of anti-fungal therapy and early surgical source control are required for successful treatment. Definitive surgical management remains unclear, but wide local debridement to halt the propagation of infection has been documented. Even with initiation of antifungal agents and surgical debridement, overall mortality still remains significantly high. Here we present a case of devastating rhino-ocular-cerebral Mucormycosis infection in an immunocompetent patient who presented to a level-II trauma center after a motorcycle collision. Clinical photos are provided in figure 1A, 1B, and 1C. Slices of a MRI of the orbits obtained are provided in figure 2A, 2B, and 2C. The current literature regarding the pathogenesis, incidence, presentation, diagnosis, and treatment of post-traumatic rhino-orbital-cerebral Mucormycosis infection in an immunocompetent patient were reviewed in this case, which was identified at a level-II trauma center in southeastern North Carolina.

