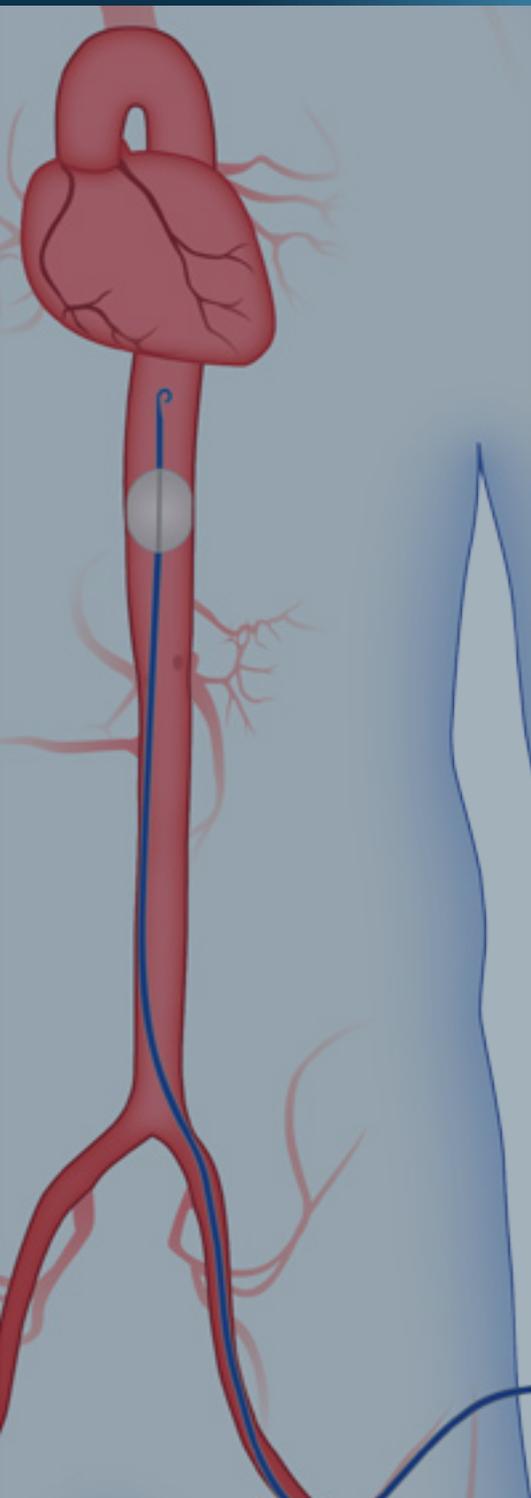


Case Report: ER-REBOA™ Catheter

Deployed to Support Open Repair of a Spontaneous Ruptured Splenic Artery Aneurysm

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Presentation

An otherwise healthy 65 year-old man presented to a rural hospital emergency department with acute onset of severe left upper quadrant abdominal pain. CT imaging demonstrated a ruptured 8 cm splenic artery aneurysm. (Fig. 1) The patient underwent central line placement and fluid resuscitation, but became hemodynamically unstable due to hemorrhagic shock. He received 30 minutes of cardiopulmonary resuscitation before being transported and received 8 units of packed red blood cells during transfer.

He arrived in the Emergency Department intubated, tachycardic, hypotensive, and mildly hypothermic with a firm and distended abdomen. Massive transfusion protocol was initiated and he was taken emergently to the OR for surgical control of intraperitoneal hemorrhage. Prior to laparotomy, the left common femoral artery was cannulated with a 7 Fr arterial introducer and an ER-REBOA™ (Prytime Medical, Boerne, TX) catheter was inserted ^{1,2}. Upon inflation of the REBOA balloon, the patient's systolic blood pressure immediately improved from 80 mmHg to 120 mmHg.

At exploratory laparotomy 3 liters of blood were removed and a splenectomy was performed. The large ruptured splenic artery aneurysm was identified and proximally ligated (Fig. 2) No aortic clamp was placed during the laparotomy.

Patient's postoperative course was complicated by pneumonia, acute respiratory failure requiring prolonged mechanical ventilation, and acute renal injury. His renal injury resolved with supportive care and the patient was discharged to a long term care facility.

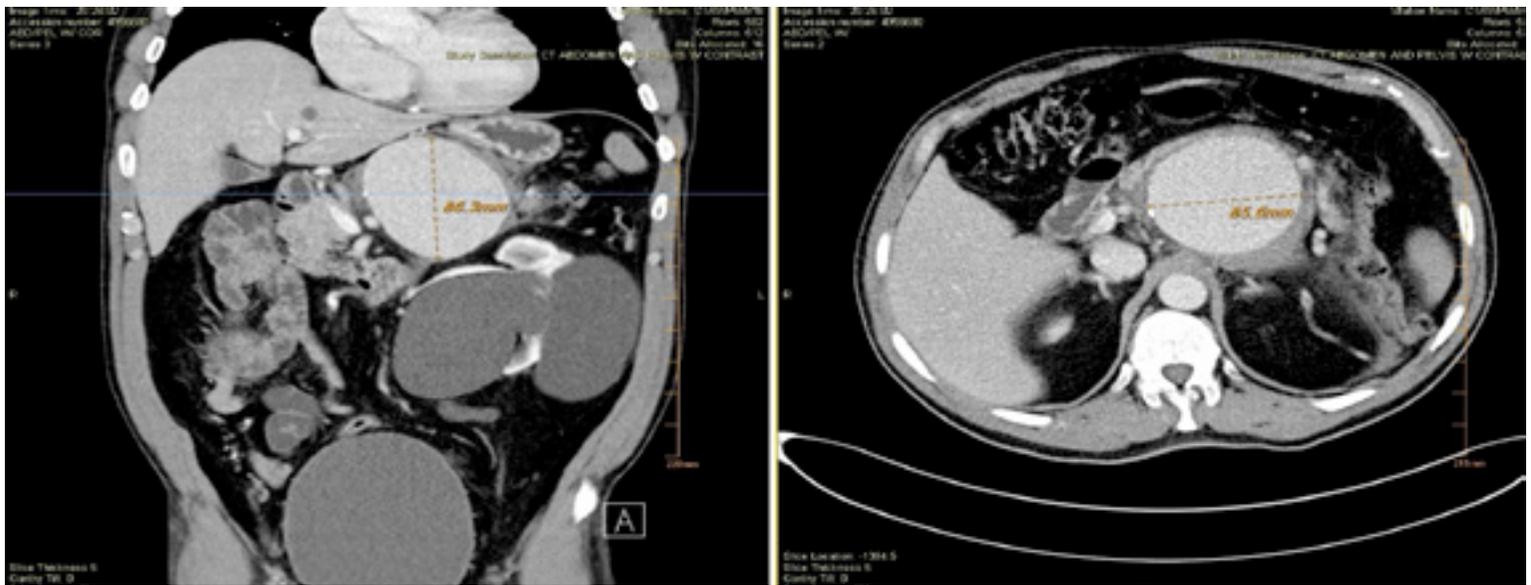


Figure 1.

Photo courtesy of Dr. Paul Granet

Abdominal computed tomography with contrast demonstrating a >8 cm splenic artery aneurysm (coronal view on the left, axial cross section on the right)

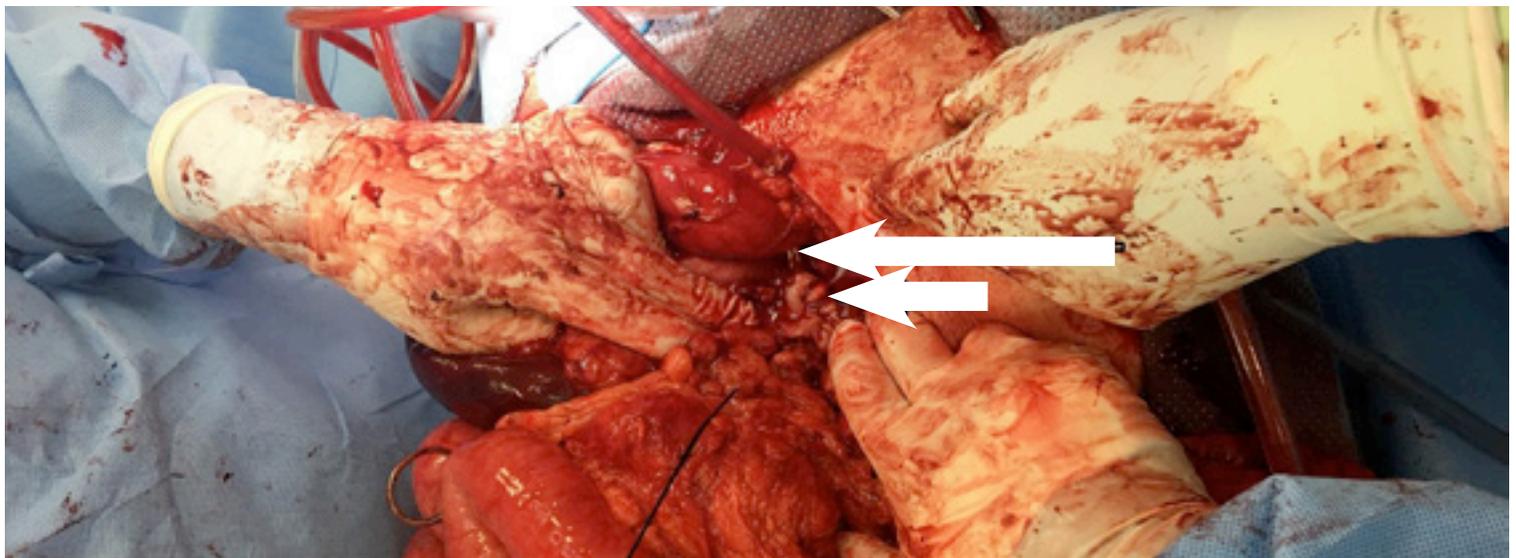


Figure 2.

Photo courtesy of Dr. Paul Granet

Intra-operative image of the transected splenic artery aneurysm with the long arrow pointing at tip of surgical clamp placed for proximal control, short arrow pointing at the lumen of the ligated splenic aneurysm.

Discussion

Splenic artery aneurysm is typically an incidental finding, but when rupture occurs is associated with substantial mortality³. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) is a minimally invasive technique using a balloon catheter to temporarily occlude the aorta (in zone 1 or 3) in support of hemorrhage control. It provides proactive management of life threatening, refractory, hemorrhagic shock in addition to maximal conventional therapy^{4,5}.

In this case, the ER-REBOA™ catheter provided proximal control of the aorta for maintenance of hemodynamics during emergency, decreasing bleeding while improving visualization during medial visceral mobilization and facilitated definitive proximal control of the splenic artery.

3. Ferrero E, et al. Visceral artery aneurysms, an experience on 32 cases in a single center: treatment from surgery to multilayer stent. *Ann Vasc Surg.* 2011 Oct;25(7):923- 35.

4. Stensaeth KH, Sovik E, Haig IN, Skomedal E, Jorgensen A. Fluoroscopy-free Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) for controlling life threatening postpartum hemorrhage. *PLoS One.* 2017 Mar 29;12(3):e0174520.

5. Pezy B, et al. Fixed-Distance Model for Balloon Placement During Fluoroscopy-Free Resuscitative Endovascular Balloon Occlusion of the Aorta in a Civilian Population. *JAMA Surg.* 2016 Dec 14.