

Case Report

Rectus Sheath Hematoma: A Rare Surgical Emergency

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Introduction

Rectus sheath hematomas (RSH) are an uncommon pathology (1,2,3). The presentation of RSH varies but the patients frequently have one or more of the following risk factors: involvement in trauma, coagulopathic, obese, cough, or pregnancy. Patients are typically managed conservatively, but there are rare cases where surgical intervention is required. Here we present a case of RSH with the rare complication of abdominal compartment syndrome (ACS), requiring both surgical and endovascular intervention. In over 6 million patients with conditions such as atrial fibrillation, mechanical heart valve, or venous thromboembolism, anticoagulation is a key component in their therapy. With the increased use of anticoagulation, there has been an increase in the incidence of RSH (4). Most uncomplicated cases can be managed conservatively. The increased incidence of RSH should also increase the number of complications associated with them. ACS is a relatively rare complication with only four reported cases, but it also represents a significantly morbid complication.

Case Presentation

A 79-year-old male was transferred to our hospital for management of his community-acquired pneumonia, pneumothorax, and increasing respiratory distress. The patient had a significant past

medical history of hypertension, hyperlipidemia, atrial fibrillation for which he was taking coumadin blood thinner and had a pacemaker. He had initially presented to an outside facility with a two-week history of high fever, shortness of breath, cough with bloody sputum, and lack of appetite. He denied any headache, abdominal pain, nausea, vomiting, or weight loss.

He was admitted to our medical intensive care unit (MICU), and placed on a high flow nasal cannula (NC). Since his pneumonia had not initially responded to management at the outside facility, he was placed on broad-spectrum antibiotics. On hospital day two, the patient was stable, still had a cough and leukocytosis. Switched to enoxaparin for anticoagulation. By day 3 he was liberated from high flow, his pneumothorax had resolved, and his leukocytosis was improving. The patient did notice some swelling in his right lower quadrant associated with mild pain. On day 4, he reported the swelling and discomfort to the MICU team. He also later reported nausea and had emesis. He had trouble with urination. Physical exam was significant for right lower quadrant (RLQ) swelling with a rough area of 10x10cm, with no overlying skin changes, or significant tenderness. The workup for the mass began with a kidney, ureter, and bladder (KUB) x-ray and an abdominal wall ultrasound. Ultrasound revealed a complex right lower quadrant structure measuring 15.1 x 11.5 x 4.4 cm with internal Doppler flow, a computerized tomography scan (CT) of the abdomen and pelvis with and without contrast was obtained and our surgical team was consulted. The CT showed a large right rectus sheath hematoma extension into preperitoneal space and a small amount of intraperitoneal fluid along the right paracolic gutter (Fig. 1).

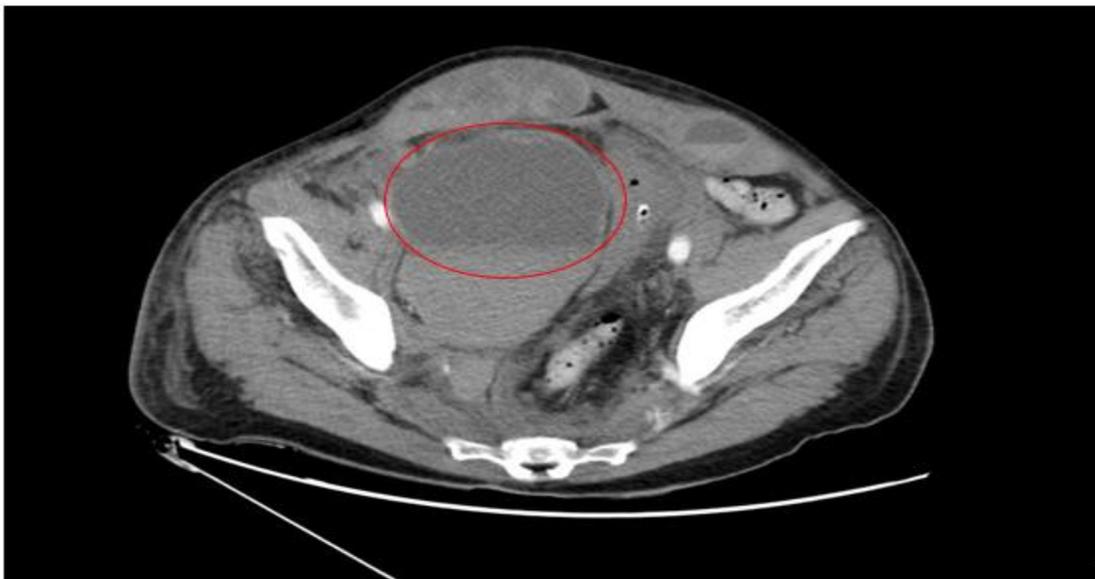


Figure 1. Contrast-enhanced CT pelvis (axial) showing right-sided rectus sheath hematoma (red circle) with extension into the right paracolic gutter.

After his CT scan, the patient had an orthostatic event, where he felt light-headed and fell after using the restroom. He was obtunded and pale when he was initially evaluated, his vitals were found to be 79/56, heart rate of 127, and oxygen saturation of 88%. He was placed on 5 liters (L) of oxygen delivered through the nasal cannula, a fluid bolus was initiated, and labs were drawn. His hemoglobin was found to be 8.4, down from 11.4 earlier that morning due to blood loss later found as a hematoma. At this point, the patient's primary care was transferred over to our surgical team, and he was transported to our surgical intensive care unit (SICU) where we could continue his resuscitation and place an arterial line. He there received two doses protamine for anticoagulation reversal, 1L crystalloid, and 2 units of packed red blood cells (PRBC). His vitals normalized, and he became more alert. Interventional radiology (IR) was consulted. Reversal of his anticoagulation was thromboelastographic (TEG) guided and included platelets, cryoprecipitate, and prothrombin complex concentrate (PCC). Throughout that day the patient had oliguria, and early into the next morning, he developed anuria. Several hours into his resuscitation, the patient acutely decompensated with hypotension, difficulty breathing, and expansion of his hematoma.

Bladder pressure was obtained, which was in the 30s, so the decision was made to take him to the operating room for decompression. The patient was explored and hematoma evacuated. The abdomen was packed with laparotomy pads and the abdomen was left open temporarily with a wound vacuum in place. Upon return from the operating room (OR), his resuscitation was continued until he was taken to interventional radiology. His right inferior epigastric artery was embolized. Later that evening he was taken back to OR for exploration, removal of packing, and closure. The patient required additional critical care postoperative, but ultimately recovered and was sent home with home health.

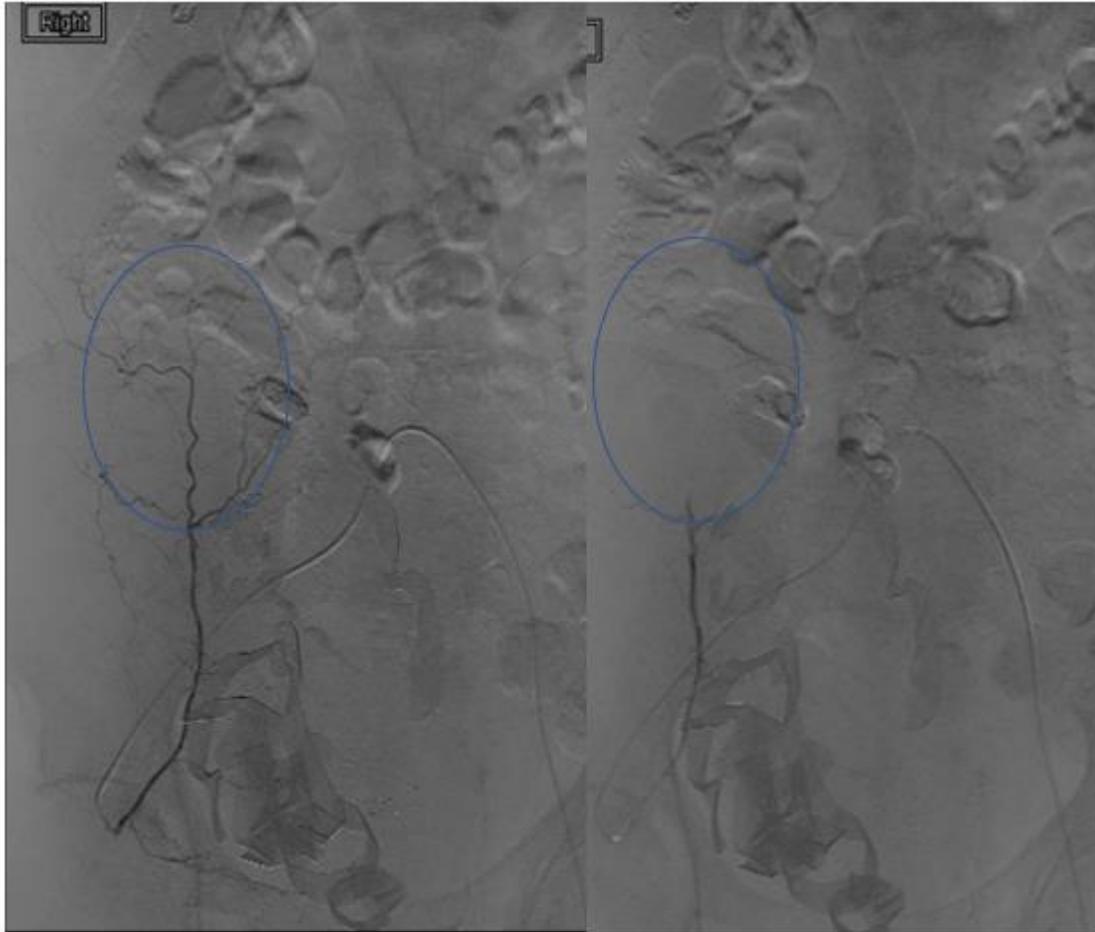


Figure 2. Angiography showing isolation of the right inferior epigastric artery before (right) and after (left) embolization.

Discussion

RSHs are an uncommon clinical event, but they are an important pathology to consider when evaluating a patient with abdominal pain. A risk factor that should raise clinical suspicion is muscle strain due such as a strain due to chronic cough as seen in our patient. Other risk factors include involvement in trauma, coagulopathy, obesity, and pregnancy (1). Most of these risk factors all have the potential to introduce significant shear stress on the superior or inferior epigastric arteries and its associated branches anastomosing between the muscle and posterior layer of the rectus sheath, or direct injury to the muscle itself (2,5,6). Coagulopathic patients typically have one of the aforementioned risk facts, but their natural ability to stop the bleeding is inhibited.

RSHs above the arcuate line is generally a result of damage to the superior epigastric artery. Below the arcuate line, the inferior epigastric vessels tend to be the source of bleeding. Large hematomas tend to occur below the arcuate line due to the absence of posterior rectus sheath enabling hematomas to spread extraperitoneal or even intraperitoneally should the peritoneum be ruptured (7). Hematomas below the arcuate line can dissect into the retroperitoneal space, where large quantities of blood may be lost before outward evidence of hematoma is detectable. Hemorrhage into this area also may minimize any natural tamponade effect.

The main features of RSH are abdominal pain with a mass, beyond that the symptoms can be quite variable. Signs that can be seen in our patient and other patients with RSH and ACS include some of the following. Abdominal bruising is a late sign, it may be periumbilical in Cullen's sign, or the flanks in Grey-Turner sign, indicating intraperitoneal rupture of an extraperitoneal extension. If clinical suspicion is high, appropriate imaging studies include abdominal ultrasound and CT scan. Treatment is usually conservative, including rest, analgesia, fluid resuscitation, transfusion if necessary, and correction of any coagulopathy. Carnett's test can help distinguish if the pain is a result of intraperitoneal or arising from the abdominal wall. Fothergill's sign helps distinguish between an intraabdominal mass and a mass from the rectus sheath (4).

For the patients who continue to bleed despite conservative measures, or those that are initially unstable aggressive resuscitative measures should be undertaken. During this time, arranging angiography with embolization or surgical ligation of the bleeding vessel should also be done. Our patient initially responded well to resuscitative measures, but then developed the rare complication of abdominal compartment syndrome. ACS is typically attributed to an increase in intraperitoneal/retroperitoneal contents in the setting of trauma or high-volume resuscitation, and less commonly due to compression of the abdominal wall. ACS is another potentially life-threatening condition, where intraabdominal pressure rises >20 mm Hg, with evidence of organ dysfunction (8). ACS due to RSH mandates surgical intervention, as conservative management has shown poorer.

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