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CASE REPORT

Obstructive Uropathy because of a Large Rectus Sheath Haematoma: A Case Report of Combined Interventional Radiology and Surgical Approach

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Introduction: Rectus sheath haematomas associated with anticoagulation are often self limiting. When large, however, they can even extend into the pelvis and cause compression of adjacent organs such as the bladder. A combined endovascular and surgical approach can decrease the operative exposure necessary to treat this occurrence.

Report: A 42 year old morbidly obese African American female on warfarin treatment for pulmonary embolism presented outside the hospital with pneumonia. During her hospitalisation, she developed a spontaneous right rectus abdominis haematoma below the level of the umbilicus with active bleeding in the extraperitoneal space causing mass compression of the bladder. She developed acute renal failure and became anuric. Following endovascular embolisation of the inferior epigastric artery, surgical exploration was successfully performed to remove the haematoma and relieve the urinary obstruction. Diuresis resumed and renal function normalised without any further evidence of bleeding.

Discussion: A large rectus sheath haematoma that extends into the bladder causing renal obstruction can be treated by endovascular embolisation and surgical exploration to limit operative risks and exposure in morbidly obese patients.

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INTRODUCTION

Rectus sheath haematomas (RSHs) are uncommon and can arise from disruption of a branch of the inferior epigastric artery at its insertion into the rectus abdominis muscle combined with an inability to tamponade the bleeding, especially below the arcuate line. RSHs have been found to be associated with severe bouts of coughing, anticoagulation therapy, subcutaneous abdominal injection of insulin, pregnancy, and connective tissue disorders. Pain and anemia are the most common manifestations. Most RSHs are self limiting and the majority does not cause hypovolemic shock requiring emergency medical or surgical intervention.[1] Herein is reported a rare rectus sheath haematoma complicated by compressive obstructive uropathy leading to acute post-renal failure that was successfully treated by a combined endovascular and surgical approach.

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REPORT

A 42 year old African American female with past medical history significant for morbid obesity (body mass index 63.8 kg/m^2), hypertension, systemic lupus erythematosus (SLE), pulmonary emboli on warfarin, and recent diagnosis of pneumonia, presented to an outside hospital with recurrent shortness of breath, severe cough, and new onset diarrhea. On presentation, the patient a had fever (39.4°C) and was tachycardic (106 beats per minute). She had mildly elevated serum creatinine (sCrea; 1.32 mg/dl) (baseline 0.8–0.9 mg/dl), normal haemoglobin (Hb; 10.2 mg/dl), and a normal international normalised ratio (INR; 1.0). Sputum culture revealed influenza A virus subtype H1N1, and stool culture was positive for *Clostridium difficile* attributable to her recent antibiotic use for the pneumonia. Her influenza infection was treated with oseltamivir and her *C. difficile* with vancomycin/cefepime. On her first hospital day, the patient began complaining of abdominal pain. CT abdomen/pelvis with contrast showed right rectus abdominis haematoma below the level of the umbilicus with active arterial bleeding in the extraperitoneal pelvis causing mass compression (Figs. 1–3). On the following day, the Hb level was on a downward trend, from 10.2 to 7.7 mg/dl. Two units of fresh frozen plasma (FFP) were given, two units of packed

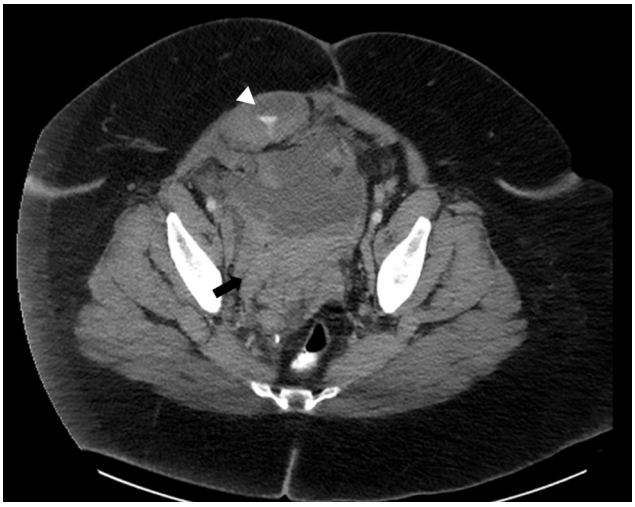

Figure 1. Active arterial haemorrhage into the rectus sheath. Axial computed tomography of the pelvis with contrast shows active arterial haemorrhage into right rectus sheath (white arrowhead) and large haematoma with layering of blood in the pelvis (black arrow).

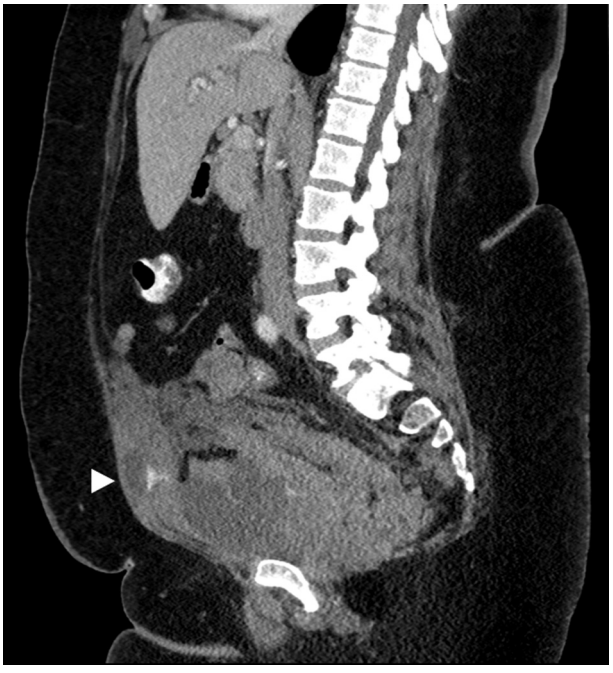

Figure 2. Large rectus sheath haematoma extending into pelvis and compressing the bladder. Sagittal computed tomography abdomen and pelvis shows the haematoma extending into the extraperitoneal pelvis causing displacement and obscuration of the bladder due to the size of the haematoma. Notice the active arterial haemorrhage (white arrowhead).

red blood cells were ordered, and the patient was transferred to the tertiary care medical centre. She was admitted to the intensive care unit and found to be anuric, tachycardic, and hypotensive but responsive to intravenous fluid resuscitation (heart rate ranging between 90 and 100 per minutes and systolic blood pressure ranging between 90 and 120 mm Hg with the mean arterial pressure (MAP) $>$ 65 mm

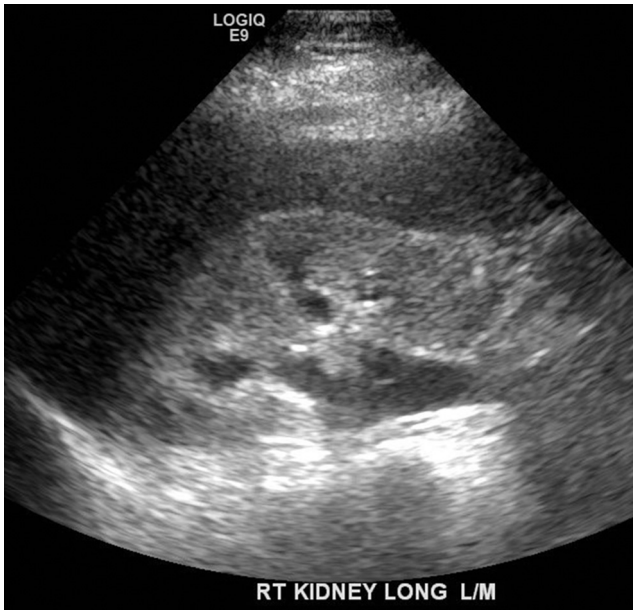

Figure 3. Hydronephrosis. Renal ultrasound shows right hydronephrosis.

Hg). Renal ultrasound showed right hydronephrosis (Fig. 3). Repeat laboratory tests upon transfer showed acute renal failure (sCrea 5.56 mg/dl) and the Hb level going down further from 7.7 to 7.2 mg/dl. The serum vancomycin level was 8.1 μg/ml (normal low 4 μg/ml; normal high 40 μg/ml). Anti-double stranded DNA antibody (anti-dsDNA) IgG and anti-nuclear antibodies (ANAs) for SLE in the serum were not detected. A Foley catheter was placed, and critically elevated bladder pressures (∼50 mmHg) were measured that raised a concern of abdominal compartment syndrome. An emergency surgical consultation was requested. Abdominal examination showed significant tenderness, notably in the suprapubic, right lower, and right upper quadrant over a palpable haematoma. The patient had no urine output for almost 20 hours, with worsening and severe suprapubic pressure and pain. The decision was made to take the patient to the interventional radiology (IR) suite for coil embolisation of the inferior epigastric artery first followed by transfer to the operating room (OR) for evacuation of the compressive right pelvic haematoma.

In IR, embolisation of the right inferior epigastric artery was performed. Real time ultrasound guidance was used to access the contralateral femoral artery with placement of a 5F vascular sheath; a reverse curve catheter SOS1 was used to select the right common iliac artery under fluoroscopy. Over a guidewire, this catheter was exchanged for a 5F angled glide catheter that was positioned at the right external iliac artery. An angiogram showed diffusely small arteries related to the hypovolemic state. Then via a coaxial renegade high flow microcatheter and guidewire, the right inferior epigastric artery (RIEA) was selected; the angiogram showed no active arterial bleeding but compressive effects of the haematoma. Embolisation of the RIEA was performed with 0.018 inch tornado microcoils (Fig. 4). Additionally, given the extent of haematoma and the plan for immediate