

Rectus Sheath Haematoma - Rare Presentation as Acute Urinary Retention

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ABSTRACT

Rectus Sheath Haematoma (RSH) is the accumulation of blood in the sheath of the rectus abdominis, secondary to rupture of an epigastric vessel or muscle tear. It can occur spontaneously or after trauma. It is an uncommon cause of acute abdominal pain presenting to the Emergency Department and a rarer cause for acute urinary retention. To the best of our knowledge, this is the first report of RSH presenting as acute urinary retention. A 36-year-old Asian gentleman presented to the Emergency Department with complaints of acute onset urinary retention and left flank pain since one week. There was minor trauma to the abdomen two months ago, with no acute trauma. A history of prolonged bleeding from finger cut in childhood was also present. On examination there was left lower quadrant abdominal tenderness with a diffuse non-pulsatile mass in the same quadrant extending into the pelvis. Vitals were stable. Lab investigations revealed reduced haemoglobin and prolonged activated Partial Thromboplastin Time

(aPTT). The prothrombin time was normal. The factor VIIIc level was markedly reduced. USG abdomen showed 280 mL of heteroechoic collection in the left anterior abdominal parietal wall, in the left rectus abdominis muscle extending to the pelvic region, compressing the urinary bladder. Computed Tomography (CT) of the abdomen and pelvis showed a RSH compressing the urinary bladder, bladder outlet and proximal urethra. Acute retention of urine was relieved immediately on catheterisation of the urinary bladder. Patient was managed conservatively with Foley's catheter placement, and multiple transfusions of blood and factor VIII. Majority of patients with RSH can be managed conservatively. Failure to recognise RSH in patients with acute urinary retention could result in unwarranted surgical and urological interventions. In this report we emphasize the need to consider rectus sheath lesions in patients presenting with urinary retention and utility of imaging modalities such as USG or CT in quick diagnosis.

Keywords: Anticoagulation, Factor VIII deficiency, Prevesical space, Space of retzius

CASE REPORT

A 36-year-old Asian male presented to the emergency room with complaints of inability to pass urine for one day and left flank pain for one week. The urinary retention was sudden in onset with no history of acute trauma. The left flank and lower abdominal pain was dull aching with no radiation. There was minor trauma to the abdomen two months ago as a result of sudden deceleration while driving. He gave history of prolonged bleeding from finger cut in childhood. There was no history of haemarthrosis or family history of prolonged bleeding. No history of recent urinary tract infections. He is not on any regular medications.

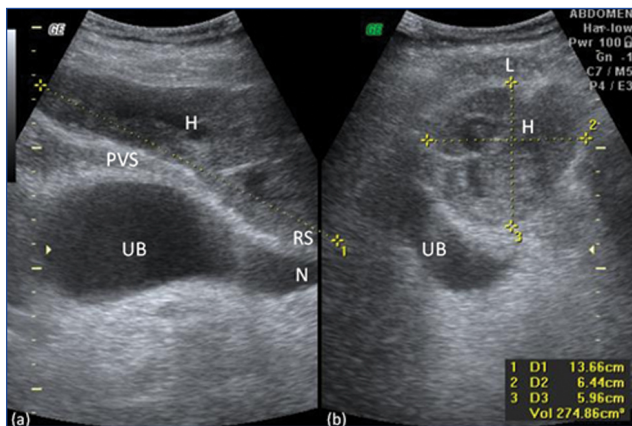
On examination there was no obvious swelling or ecchymosis in the abdomen. Tenderness was noted in the left lower quadrant of the abdomen. There was a diffuse non pulsatile mass measuring approximately 15 x 15 cm in the left lower

quadrant extending into the pelvis. External genitalia appeared normal. Normal bowel sounds were heard. On examination his pulse was 84 bpm and BP was 130/70 mmHg while respiratory rate and temperature were normal.

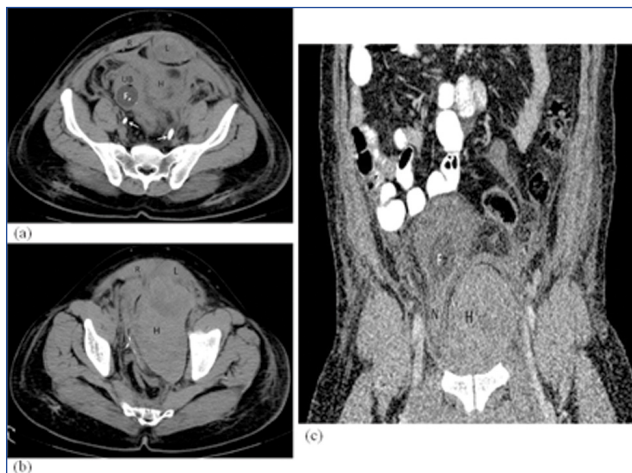
Lab parameters: Haemoglobin was reduced (5.8mg/100 mL), Total WBC count was mildly elevated (12000/ μ L), aPTT was prolonged (64.1sec), the International Normalised Ratio (INR) of prothrombin time was normal (1.09) and there were elevated lactic dehydrogenase levels. Platelet count was normal (2.95 lakhs/ μ L). His total bilirubin was elevated, 3.5 mg/100 mL of which conjugated bilirubin was 2.5 mg/100 mL. There was mild elevation of liver enzymes. Factor VIIIc levels were markedly reduced, 2.8 IU (Normal: 50-150 IU). Serum amylase and lipase levels were normal. Peripheral smear examination revealed microcytic hypochromic anaemia with neutrophilic leucocytosis. Urine examination revealed many red blood cells.

Ultrasound examination of abdomen showed a heteroechoic collection in the parietal abdominal wall [Table/Fig-1a,b] in the left rectus abdominus, with a volume 275 cc. Superiorly, it was extending up to the arcuate line through the prevesical space. Inferiorly, it was noted extending into the space of Retzius and causing bladder neck compression. The mass was causing left superolateral impression on the bladder.

A Contrast Enhanced Computed Tomogram (CECT) of the abdomen revealed a large heterodense (27 to 61 HU) lesion [Table/Fig-2], arising in the left rectus muscle and sheath with



[Table/Fig-1]: USG images, longitudinal (a) and transverse (b) sections showing a Heteroechoic structure arising from the left rectus abdominis (L) Occupying the prevesical space (PVS) causing significant mass effect on the urinary bladder. Inferior extension of the lesion into the Space of Retzius (RS) with bladder neck (N) compression is also seen.



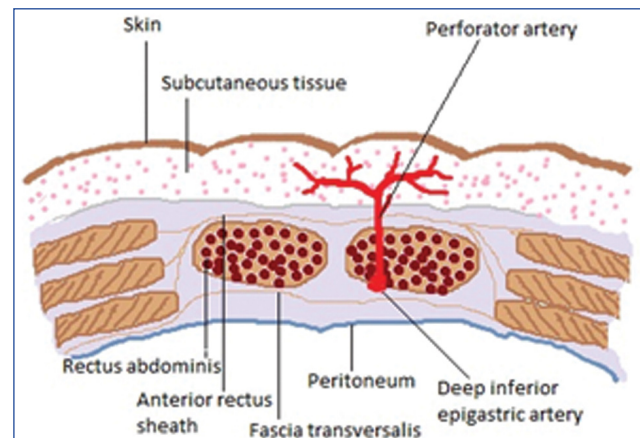
[Table/Fig-2]: CECT axial and coronal reformatted images- a) Delayed axial images showing haematoma (H) in the left rectus abdominis and prevesical space causing extrinsic compression and right lateral displacement of the urinary bladder (UB). Also note the normal bulkiness of the right rectus muscle (R); b) Delayed axial images at the level of bladder neck and urethra. Foley's tube (F) in the bladder neck with contrast, is seen compressed and displaced to the right by the large haematoma (H). Bulky left rectus muscle also is seen (L); c) Coronal reformatted image showing the mass effect on the bladder and its neck (N) by the haematoma.

no enhancement. The size of the rectus sheath lesion is 15 (craniocaudal) x 3.5 (anteroposterior) x 3.5 (transverse) cm. The lesion was noted to dissect along the fascia and extend into the peritoneum and the left anterolateral prevesical space, where it measures 11 x 8 x 8 cm. Urinary bladder was minimally filled with a Foley's bulb insitu. The bladder was pushed to the left by the lesion. A diagnosis of Type III RSH was made.

Based on the CT classification system of RSH [3] [Table/Fig-3] and the significant drop in haemoglobin (from apparently normal to 5.8 mg/100 mL), our patient was classified as a case of Type III RSH. On reviewing the previous history of prolonged bleeding and the coagulation profile (bleeding time of 14 min and clotting time of 19 min), factor VIII deficiency was identified as the cause of RSH. After explaining to the patient about his condition proper consent was taken. He was catheterised to

Grade	Anatomy	Haemoglobin	Management
I	Unilateral, intramuscular. Does not dissect along fascial planes.	No drop in Haemoglobin.	Conservative with OPD follow up.
II	Bilateral with some dissection between the muscle and transversalis fascia. No prevesical space extension.	Minor drop in Haemoglobin.	Observation. Short hospital stay. Transfusion, if needed.
III	Bilateral. Large, dissects between the transversalis fascia and muscle into the peritoneum and prevesical space.	Significant drop in Haemoglobin.	Blood transfusion, reversal of anticoagulants and may need angiographic intervention.

[Table/Fig-3]: CT diagnostic classification of rectus sheath haematoma [3].



[Table/Fig-4]: Schematic diagram showing the cross section of the anterior abdominal wall below the arcuate line. The deep epigastric artery and its perforating branch from the posterior aspect of rectus muscle are seen. Also note the absence of posterior rectus sheath in comparison with the anterior.



[Table/Fig-5]: NECT reformatted sagittal image showing the normal anatomy. The space of Retzius (RS, dotted white line) is shown overlapped by the pubic symphysis (PS) anteriorly. The prevesical space (PVS) is seen as its extension anteriosuperiorly. Urinary bladder (UB), the rectus abdominis (R) and the prostate (P).

relieve the urinary retention. He was managed conservatively with multiple blood transfusions (four pints of packed cells and six pints of cryoprecipitate). He was followed up for six months with rapid improvement in urinary retention in two weeks and gradual reduction in the size of haematoma in six months.

DISCUSSION

RSH is the accumulation of blood in the sheath of the rectus abdominis, secondary to rupture of an epigastric vessel or muscle tear. It can occur spontaneously or after trauma. Other predisposing factors include anticoagulation, blood dyscrasias, previous abdominal operation, laparoscopic trocar injury, subcutaneous injection of drugs and increased intra abdominal pressure from coughing, straining or pregnancy [1,2]. The increasing use of antiplatelet and anticoagulant therapies has led to an increase in RSH in patients without obvious precipitating events [3,4]. Abdominal wall pathology is a frequently overlooked cause of acute abdomen leading to delays in diagnosis [5]. Prevesical space (space of Retzius) pathologies causing mass effect on the urethra or/and bladder is a rare cause of urinary voiding difficulties [5-7]. In Type III RSH, the haematoma can extend into the prevesical space [3] and compress the bladder neck and cause urinary retention [Table/Fig-3]. We report one such case of spontaneous RSH presented with acute urinary retention and abdominal pain to the Emergency Department in our hospital.

Type III RSH is a rare pathology which can mimic other acute abdominal conditions and is important to consider in the diagnostic workup. The differential diagnosis includes appendicitis, abdominal wall tumours, and hernias to name a few. Depending on the location and extent of the RSH, this pathology can imitate biliary, splenic, gynaecologic or mesenteric disease [3].

Anatomy of the Rectus Sheath and Prevesical Space

The rectus sheath comprises two parallel muscles of the anterior abdominal wall, a posterior arising blood vessels from the internal thoracic and external iliac arteries and a fascial sheath covering. The rectus muscles are divided in the midline by the linea alba and are enveloped by fascia from the aponeurosis of the external oblique, internal oblique, and transverse abdominis muscles above the arcuate line where as below the arcuate line, there is only an anterior rectus sheath [Table/Fig-4]. Rectus muscles are attached to the enveloping fascia by three to four tendinous intersections above the arcuate line. These intersections contain multiple perforators from the epigastric vessels [Table/Fig-4], supplying the overlying fascia and soft tissue. The perforators are most dense in periumbilical areas [6].

RSHs can occur somewhat easily, owing to the significant mobility of the rectus muscles in the region below the arcuate line, exposing the fixed epigastric vessels to injury [8]. Below the linea semicircularis, the absence of a posterior rectus sheath allows a haemorrhage to cross the midline and invade the space of Retzius, irritating the bladder and peritoneum [4].

The prevesical space is the space between visceral peritoneum and parietal peritoneum and the transversalis fascia more superiorly, and it tapers superiorly toward the umbilicus. Prevesical space communicates with the properitoneal fat of the abdominal wall and flanks laterally. It surrounds the lateral walls of the urinary bladder in the posteroinferior aspect and forms the retropubic space (the space of Retzius) anteroinferiorly [4,6] [Table/Fig-5].

RSH can occur in any of the four quadrants, but are more common on the right (60%) than the left (40%) possibly due to right-handedness and increased strain on the right rectus muscle [4]. They are also more common in females which are attributed to women's decreased muscle mass.

Elder individuals (>60 years), anticoagulation therapy, hypertension, atherosclerosis, and chronic cough are risk factors for RSH [9]. Spontaneous RSH has been documented in association with pregnancy, localised trauma and after a surgical procedure [1]. Also, there may be a history of trauma to the abdominal wall in the region of the rectus muscles or a paroxysm of coughing.

Diagnosis and Treatment

Patients with RSH most commonly present with acute onset abdominal pain that has worsened over the past few hours. The pain is typically described as sharp and stabbing. It is common to have no palpable or visual mass on physical examination because the vessels run posterior to the rectus muscle [Table/Fig-4]. Depending on the degree and location of haematoma, the patient may present with signs of intraperitoneal irritation

such as guarding and rebound tenderness [6]. Depending on the severity of rupture patients may present with signs of hypovolemic shock such as pallor, confusion and diaphoresis. Vital signs may also show hypotension, tachycardia and tachypnoea.

On physical examination, the Fothergill's sign helps to determine if the mass is in the abdomen or in the abdominal wall [7]. It is conducted by having the patient lay in the supine position while lifting either their legs or head. If the mass is in the abdominal wall, it will not cross the midline and will remain palpable.

Conversely, intra-abdominal masses will sink below the flex musculature during the Fothergill's maneuver [8].

Patients may exhibit periumbilical ecchymosis (Cullen's sign) or flank ecchymosis (Grey-Turner's sign) in the recovery phase of RSH, most commonly appearing 2-5 days post incident [10]. In this patient flank ecchymosis developed by 4th day.

Imaging modalities such as CT, ultrasonography and MRI have been used to confirm the diagnosis of an RSH. However, ultrasonography, although useful as an initial screening test, may not be as sensitive as CT (71% vs 100%) [9]. MRI is helpful in distinguishing chronic RSH from other anterior abdominal wall masses [11].

After confirmation of the diagnosis and elimination of the possibility of other intra abdominal conditions (such as ovarian torsion, hernia, appendicitis, or urinary tract obstruction) treatment often consists of abdominal wall rest, analgesia, discontinuation of any anticoagulation therapy, blood and blood product transfusions (if appropriate), and clinical observation [1].

Patients with a Type III haematoma will often require a blood transfusion and several days of inpatient bed rest, with serial physical examinations, serial haematocrit measurements, and additional imaging as indicated.

Surgical procedures may be used for diagnostic purposes as well as to control continued haemorrhage or intraperitoneal rupture [2]. In general, surgical procedures for these purposes consist of clot evacuation, ligation of all bleeding vessels and closed suction drainage, as necessary. Although, drainage of the haematoma percutaneously has been discouraged because of the possibility of contamination and the release of a tamponade, this technique may be both therapeutic and diagnostic [12].

After correcting any coagulation abnormalities, embolisation may also be used to obtain local control [12]. The disease process is usually thought of as self limited. However, a mortality rate of 18% of patients with RSHs who underwent surgery has been reported [13]. Also, a spontaneous death rate of 25% of individuals with an RSH has been reported [13].

CONCLUSION

To the best of our knowledge this is the first reported case of Type III RSH presenting as acute urinary retention. The patient was eventually diagnosed to have haemophilia and hence the cause for RSH was identified. Early and accurate diagnosis of RSH and its cause if any, can save the patient from unnecessary invasive procedures and even from death. We emphasize the awareness of this rare clinical condition among physicians and the need to include this among the differential diagnoses of acute urinary retention.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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