Spontaneous rectus sheath haematoma
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Section: Abdominal imaging
Imaging Technique: Ultrasound
Imaging Technique: CT
Case Type: Clinical Cases
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Patient: 63 years, female

Clinical History:
Sudden onset left lower quadrant pain associated with the appearance of a mass and drop in haematocrit.

Imaging Findings:
A patient, with a known history of ischaemic heart disease and aortic regurgitation, was admitted with shortness of breath and chest pain. There was also a history of cough for 1 week.
Initial medication was aspirin 7mg every morning, atenolol 50mg every morning, lisinopril 20mg every morning and monoxidine 200microg once daily.

On admission abdominal examination was normal, and FBC results were: Hb 12.0g/dl, WCC 8.0 x 10^9/l, Platelets 322 x 10^9/l.
Subcutaneous clexane 50mg twice daily was prescribed for deep vein thrombosis prophylaxis.

Nine days following admission the patient developed sudden onset left lower abdominal pain. Physical examination at this time determined a left-sided abdominal mass. A plain abdominal x-ray was performed.
Ultrasound examination was performed 4 days later (3.5MHz curvilinear and 5MHz linear probes). At this stage FBC results were: Hb 9.9g/dl, WCC 9.9 x 10^9/l, Platelets 280 x 10^9/l. In the intervening time the patient underwent cardiac catheterisation via a right femoral approach, which found severe aortic regurgitation, with a recommendation of aortic valve replacement during this admission.
Abdominal and pelvic CT examination was performed a further 4 days later (multi-slice, with IV and oral contrast, 7.5mm reconstructions). At this stage FBC results were: Hb 9.6g/dl, WCC 8.8 x 10^9/l, Platelets 356 x 10^9/l. INR was 1.0.
The rectus sheath haematoma was treated conservatively. The patient was transfused 2 days later. The planned aortic valve replacement was postponed due to methicillin-resistant Staphylococcus aureus (MRSA) infection.

Discussion:
Rectus sheath haematoma has been known in medical practice since ancient Greek times. However, the major difficulty is one of initial diagnosis, and this requires an index of clinical suspicion. A positive Carnett's sign may indicate the diagnosis, although the pain may radiate over a diffuse area of the abdomen. If a localised, tender trigger point can be identified and the tenderness is unchanged or increased when the abdominal muscles are tensed, then the abdominal wall is the likely origin of the pain.
In a study using ultrasound for the investigation of non-specific abdominal pain (i.e. no working clinical diagnosis), the incidence of rectus sheath haematoma was 1.8%.

The aetiological causes may be local trauma, severe coughing, or defaecation, or the haematoma may arise spontaneously. Other risk factors include arterial hypertension and anticoagulant therapy. The latter is also associated with a larger haematoma and a greater likelihood of surgical treatment (usually reserved for very large haematomas or intraperitoneal rupture), although coil embolisation has been described.

The most frequent localisation is in the lower part of the abdomen: the explanation lies in the abdominal wall anatomy, especially in the arcuate line of the rectus sheath. The rectus abdominis muscle lies between the aponeuroses of the transverse (transverses abdominis) and oblique (internal and external oblique) muscles that form the so-called rectus sheath. This arrangement is found from the costal margin to a level approximately between the umbilicus and the pubic symphysis, where the rear layer of the rectus sheath ends with a curved edge, called the arcuate or semicircular line of Douglas. Beneath this line the aponeuroses of the three muscles pass anterior to the rectus, separated from the peritoneum only by the fascia transversalis: a thin connective layer between the rectus and the preperitoneal fat. In this inferior aspect of the muscle the perforating branches of the inferior epigastric artery running in the preperitoneal fat may rupture causing a large haematoma widely spreading in this loose space.

The patient in this case presented with typical clinical features. There was a sudden appearance of the left lower wall abdominal mass whilst in hospital. A cough lasting a week was noted on admission. The patient was placed on clexane 50mg twice daily whilst in hospital for thrombosis prophylaxis. Although the use of low molecular weight heparin is not monitored by traditional laboratory coagulation studies, the effectiveness of the therapy in preventing thrombosis must mean that there is an inhibiting effect on the normal coagulation pathways. There was also a drop in haemoglobin levels from 12.0 to 9.9 (immediately before and after the appearance of the abdominal mass).

The imaging studies show typical findings. The plain abdominal x-ray shows an ill-defined soft tissue mass (indicated by an increase in opacity) in the left lower quadrant. Ultrasound shows a well-circumscribed mass (11.2cm x 5.6cm x 3.9cm) lying deep to the anterior abdominal musculature but extra-peritoneal, with a slightly heterogeneous appearance typical of a haematoma.

CT examination was confirmatory and shows again a well-circumscribed mass deep to the anterior abdominal wall but extra-peritoneal with a Hounsfield number of 65 (compatible with clotted blood).

The key to diagnosis is an index of clinical suspicion so that confirmatory imaging can be undertaken

**Differential Diagnosis List:** Spontaneous rectus sheath haematoma

**Final Diagnosis:** Spontaneous rectus sheath haematoma

**References:**


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Figure 1

Description: Plain abdominal x-ray showing indistinct soft tissue shadow in the left lower quadrant.
Origin:
Description: Close-up of the left lower quadrant in Fig. 1a showing indistinct soft tissue shadow in the left lower quadrant. Origin:
Figure 2

a

Description: Longitudinal ultrasound image (3.5MHz curvilinear probe) showing heterogeneous mixed echogenic mass deep to the rectus abdominis. Origin:

b

Description: Transverse ultrasound image (3.5MHz curvilinear probe) showing heterogeneous mixed echogenic mass deep to the rectus abdominis. Origin:
Description: Transverse ultrasound image (5MHz linear probe) showing heterogeneous mixed echogenic mass deep to the rectus abdominis. Origin:
Description: Longitudinal ultrasound image (5MHz linear probe) showing heterogeneous mixed echogenic mass deep to the rectus abdominis. Note the distinct lower border on the right of the image.

Origin:
Description: Axial contrast-enhanced (oral and intravenous) CT image (7.5mm reconstruction) in the mid-abdomen showing the twin rectus abdominis muscles anteriorly with the three lateral abdominal wall muscles. Origin:
Description: Axial contrast-enhanced (oral and intravenous) CT image (7.5mm reconstruction) at the level of the iliac crests. Note the haematoma can clearly be seen behind the left rectus abdominis muscle, displacing the peritoneum posteriorly. Origin:
Description: Axial contrast-enhanced (oral and intravenous) CT image (7.5mm reconstruction) at the level of the sacro-iliac joints. Note the haematoma here has a measured Hounsfield value of 65 (compatible with clotted blood). Origin:
Description: Axial contrast-enhanced (oral and intravenous) CT image (7.5mm reconstructions) just above the acetabula. The posterior part of the rectus sheath is completely deficient allowing the haematoma to expand in the loose areolar tissue. Origin:
**Description:** Axial contrast-enhanced (oral and intravenous) CT image (7.5mm reconstructions) just above the symphysis pubis. The most inferior aspect of the rectus abdominis muscles can be seen, with no evidence of haematomata at this level. **Origin:**