CASE REPORT

Rectus sheath haematoma causing ureteric obstruction

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SUMMARY

Rectus sheath haematoma is an uncommon condition. However, its incidence is increasing, attributed to greater use of anticoagulant therapy. We present the case of an 83-year-old woman on therapeutic enoxaparin for a prior pulmonary embolus who underwent elective right hemicolectomy and developed a rectus sheath haematoma 13 days postoperatively. Her extensive haematoma compressed retroperitoneal structures including the right ureter. She was successfully managed conservatively.

BACKGROUND

Rectus sheath haematomas form due to injury to the rectus abdominis muscle or rupture of the inferior or superior epigastric vessels. It is often self-limiting but may be fatal in some cases.¹ It typically presents with severe abdominal pain following vigorous abdominal contraction. Imaging is crucial to the diagnosis, with computed tomography (CT) scanning the modality of choice. Most cases can be treated conservatively, with invasive options including surgery or angioembolisation.

CASE PRESENTATION

An 83-year-old woman from home with her husband, fully independent and still driving, was investigated for chronic constipation, iron deficiency anaemia and weight loss. Outpatient colonoscopy revealed an obstructing adenocarcinoma just past the hepatic flexure. Contrast CT scan of the abdomen and pelvis confirmed a 6 cm caecal malignancy adherent to the gallbladder, associated with two prominent lymph nodes and small right segmental pulmonary embolus. She was subsequently commenced on therapeutic enoxaparin 60 mg subcutaneously twice daily.

Her history consisted of aortic stenosis, paroxysmal atrial fibrillation, ischaemic stroke, hypertension, chronic obstructive airways disease and depression. She was an active smoker with a 65-pack-year history and drank four standard drinks of alcohol daily.

The patient's medications consisted of oral mane aspirin 100 mg, irbesartan 150 mg and cholecalciferol 2000 U, nocte simvastatin 10 mg and citalopram 40 mg, paracetamol 1 g four times daily, inhaled mane tiotropium 5 µg mane and subcutaneous enoxaparin as above.

The patient electively underwent laparoscopic right hemicolectomy, end ileostomy and

cholecystectomy for a caecal mass. Her enoxaparin was withheld for 24 hours prior to her operation and then restarted day 1 postoperatively. Pathology revealed poorly differentiated colonic adenocarcinoma infiltrating pericolic fat but not the gallbladder. Of the 30 lymph nodes resected, only one was involved due to direct extension of primary tumour (stage T3 N1a). Her postoperative recovery was complicated by hospital-acquired pneumonia and postoperative ileus with vomiting. The ileus resolved after a brief period of gastric decompression via nasogastric tube inserted. Her pneumonia was managed with a period of supplemental oxygen and intravenous ceftriaxone 1 g daily and metronidazole 500 mg twice a day.

Thirteen days postoperatively, she developed right-sided lower abdominal pain and lightheadedness. Her systolic blood pressure was 85/40 mm Hg, heart rate 85/min, respiratory rate 17/min and pulse oximetry 93% on 2 L/min supplemental oxygen.

On examination, she was alert and orientated but pale. Her abdomen was soft, with right upper and lower quadrant tenderness. There was a palpable right abdominal wall mass, but no visible skin discoloration. On chest auscultation, the patient had bibasal crepitations. Rectal examination revealed soft stool with no mass or blood.

INVESTIGATIONS

Serum studies at the time of her flank pain and hypotension 13 days postoperatively revealed haemoglobin of 72 g/L, compared with her preoperative baseline of 90 g/L and the reading the day prior of 85 g/L. White cell count was $15.3 \times 10^9/L$ and platelets $452 \times 10^9/L$. Serum creatinine was 35 µmol/L, with an estimated glomerular filtration rate (eGFR) of $>90 \text{ mL/min/1.73 m}^2$. Interventional normalised ratio was 1.2 and activated partial thromboplastin time was 30 s.

Urine microscopy revealed an elevated concentration of erythrocytes 119 red blood cells per 50 high-power fields and no other abnormality. Electrocardiogram was normal and chest X-ray revealed left basal consolidation consistent with her known hospital-acquired pneumonia.

A CT abdomen/pelvis and angiography was ordered. This revealed an $18.5 \times 7.9 \times 7.8 \text{ cm}$ heterogeneous collection arising from the right rectus sheath. The collection compressed the peritoneal cavity with displacement of bowel and pelvic organs to the left, and was associated with right hydroureteronephrosis (figures 1 and 2). There was

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Figure 1 Contrast CT scan of the abdomen and pelvis, arterial phase, axial views. (A) Upper pelvis. The large rectus sheath haematoma (red dashes) can be seen extending to the retroperitoneal structures, displacing medially the right ureter (yellow arrow). (B) Lower pelvis. The inferior extent of the rectus sheath haematoma (red dashes) is seen, displacing left-wards the catheterised bladder (yellow arrow), uterus (green arrow) and rectum (blue arrow).

no evidence of active haemorrhage at the time of study, so angio-embolisation was not performed.

DIFFERENTIAL DIAGNOSIS

The patient was assessed as most likely suffering a rectus sheath haematoma due to vessel disruption from vigorous rectus abdominis contraction due to coughing secondary to pneumonia and/or vomiting due to ileus. The significant haemorrhage was felt to have been promoted by her therapeutic enoxaparin. Differentials included an underlying vascular malformation and muscular injury from laparoscopic port placement during hemicolectomy.

TREATMENT

The patient was commenced on intravenous fluid resuscitation and serum was urgently sent for blood type and cross-match. She was subsequently transfused with 2 U of matched O-positive red blood cells. Her therapeutic enoxaparin was withheld. Her antibiotics were upgraded to intravenous piperacillin/tazobactam 4.5g three times daily, as prophylaxis against infected haematoma. Within 3 hours, the patient's vitals had improved to blood pressure 125/60 mmHg and heart rate 80 beats per minute. Thus, the decision was made to continue conservative management.

Figure 2 Contrast CT scan of the abdomen and pelvis, late arterial phase, coronal views. The rectus sheath haematoma is visible (red dashes). (A) Right hydronephrosis is present, while the left collecting system is normal. (B) The catheterised bladder (yellow arrow) is displaced left-wards.

The patient was transfused a further 4 U of packed red blood cells in the following 2 days to obtain serum haemoglobin of 100 g/L. She was monitored with 4 hourly observations and daily haematocrit measurement. Her pain resolved and she remained normotensive, with unchanged rectus sheath haematoma on abdominal examination. Therapeutic enoxaparin was restarted 7 days post-event. Urine output was always >30 mL/h. Her eGFR had initially dropped to 77 mL/min/1.73 m², but recovered to >90 mL/min/1.73 m² by 8 days post-event (21 days postoperatively).

OUTCOME AND FOLLOW-UP

The following day, with haemoglobin stable at 108 g/L, the patient was transferred to a rehabilitation unit for physiotherapy prior to discharge home. Her planned follow-up consists of contrast CT of the abdomen and pelvis, repeat serum testing and clinic review 6 weeks postdischarge.

DISCUSSION

Rectus sheath haematoma is a relatively rare cause of abdominal pain.¹ It may be caused by rectus abdominis muscle injury or ruptured rectus sheath vessels. These may be the inferior or superior epigastric vessels, or their branches. Several risk factors have been described, many of which were present in our patient. The disease is strongly associated with anticoagulant therapy and can occur in the setting of haematological disorders, trauma, following abdominal surgery or due to increased intra-abdominal pressure (such as coughing, sneezing, pregnancy, strenuous exercise or defecation straining).^{1,2} It has also been reported to occur more frequently in female and elderly patients, thought secondary to decreased muscle mass in these patient groups.³

Symptomatology varies significantly proportional to the size and location of the haematoma and degree of peritoneal irritation. The most common clinical presentation is abdominal pain and a palpable abdominal wall mass. Patients may also displace Fothergill's sign, a mass in the abdominal wall that does not cross the midline and is palpable on contraction of the rectus muscle.⁴ The blood loss from large haematoma can cause anaemia, hypovolaemia and haemodynamic instability. Large haematomas have also very rarely been shown to cause secondary hydronephrosis, with less than 10 cases reported to date.⁵

Imaging is crucial to diagnosis. With sensitivity and specificity of >90%, CT is the imaging of choice, as it accurately reveals the haematoma's location, size and extension, or reveals alternative abdominal pathology.¹ Ultrasound is considered second line, with reported sensitivity of >80% and the advantage of being

inexpensive and without radiation risk. It can also be helpful in serial haematoma monitoring.

Rectus sheath haematomas are usually self-limiting and conservative treatment is successful in most cases. Conservative treatment includes analgesia, fluid resuscitation including blood transfusion, withdrawal and/or reversal of anticoagulation, bed rest and treatment of any underlying causative condition.⁴

Patients with haemodynamic instability, transfusion dependence or progressive haematoma enlargement will require surgical intervention. This typically involves dissection onto the haematoma, evacuation of clot and direct control of bleeding vessels or muscle. In some cases, it may be necessary to ligate the inferior epigastric vessels. However, surgery usually involves significant morbidity.⁴ An alternative approach involving interventional radiology is angioembolisation of the bleeding vessels.⁶

Learning points

- ▶ Rectus sheath haematoma is an uncommon cause of abdominal pain.
- ▶ Large haematomas may rarely cause ureteric obstruction.
- ▶ Imaging is crucial to diagnosis.
- ▶ Conservative treatment is successful in most cases.

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