CASE REPORT

Abdominal pain and collapse in the emergency department

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SUMMARY

Rupture of a splenic artery aneurysm is a rare but life-threatening presentation to the emergency department. This case demonstrates the importance of swift resuscitation and the benefit of bedside imaging in a highly unstable patient. The definitive management of this condition in patients who are refractory to resuscitative attempts is immediate surgery with the diagnosis often only confirmed at laparotomy.

CASE PRESENTATION

A 24-year-old woman was admitted with a 2 h history of abdominal pain and nausea following a similar self-resolving episode 4 days prior. The patient gave no history of other preceding illness or trauma and had been exercising that same morning with no immediate symptoms. She self-presented to the emergency department and collapsed in the waiting room. Initial observations showed her to be hypotensive with a blood pressure of 68/36 mm Hg and tachycardic with a heart rate of 110 bpm. She was pale, sweaty and clinically in hypovolaemic shock. The patient complained of abdominal pain, which was maximal in the left upper quadrant. Abdominal examination revealed a soft abdomen with generalised fullness and tenderness on the left side. There were no initial signs of local or generalised peritonism. The patient had no significant medical history and took no regular medications.

INVESTIGATIONS

Large bore intravenous access was obtained with an initial venous blood gas showing a lactic acidosis (pH 7.23, lactate 6.7). The initial haemoglobin was 11.2 g/dL, decreasing to 7.0 g/dL on repeat testing 45 min later. Urinary and plasma beta-human chorionic gonadotropin results were negative. A bedside focused ultrasound scan showed a large volume of free fluid in the abdomen (figures 1 and 2).

TREATMENT

The patient was rapidly given 2 Litres of crystalloid and transfused with O-negative blood with minimal improvement in her vital signs. After consultation with the surgical team, the patient was taken to the operating theatre for a laparotomy. Despite rapid transfer, she became profoundly haemodynamically unstable on the induction of anaesthesia. Swift laparotomy with subsequent compression of the bleeding site allowed haemodynamic stability to be restored.

Figure 1 Ultrasonographic image demonstrating intraperitoneal free fluid.

OUTCOME AND FOLLOW-UP

Operative findings revealed a ruptured aneurysm of the splenic artery with significant intra-abdominal blood loss. The splenic artery was isolated and ligated. A splenectomy was performed with reimplantation of splenic tissue. The patient went on to make a full recovery.

DISCUSSION

Splenic artery aneurysm rupture has been well described with a significant quantity of literature depicting the association of the condition with pregnancy and also other medical conditions to a lesser extent. The occurrence of this condition in a young woman, with no associated medical history and negative laboratory testing for pregnancy, is rare with only a handful of case reports describing the presentation.^{1 2}

Splenic artery aneurysms are largely asymptomatic and as such the presentation is uncommon. Stanley *et al*³ demonstrated a prevalence of 0.78%

Figure 2 Ultrasonographic image demonstrating pelvic free fluid.

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at non-specific abdominal angiography. The diagnosis is more common in women with one case series indicating that of the 100 patients studied 87 were women and that the average age of presentation was 58.2 years.⁴ Studies have suggested that approximately 3–9.6% of aneurysms present following rupture with a death rate of up to 36%.⁵ This high death rate has been attributed to the fact that patients often have minimal symptoms prior to rupture and when rupture does occur deterioration occurs rapidly.⁶

The majority of splenic artery aneurysms not presenting with rupture are diagnosed after incidental identification on routine imaging for alternative purposes, at laparotomy or at autopsy. The pathogenesis of splenic artery aneurysms is poorly understood; however, there is a strong association with pregnancy, with the risk of developing the condition increasing with higher parity.⁷ Several other aetiological factors have been suggested, including hypertension,⁸ atherosclerosis, liver disease,⁹ portal hypertension⁸ and pancreatitis.¹⁰

This case also demonstrates the double rupture phenomenon. This occurs in 20–25% of affected patients,¹¹ and involves a primary rupture that causes mild to severe abdominal pain. These symptoms are generally self-limiting because blood is confined to the lesser sac by omentum and haematoma. This is followed hours, or in some cases days, later by a secondary rupture as blood overflows through the foramen of Winslow into the peritoneal cavity leading to rapid deterioration and hypovolaemic shock.^{7 12 13}

A large quantity of literature now exists supporting non-operative management of blunt splenic trauma in haemodynamically stable patients. While this represents a different presentation to the one in this case, the same principles can be applied if the patient is stable enough for transfer for CT imaging and the interventional radiological expertise are available to undertake embolisation. The patient in this case was unresponsive to resuscitative measures and hence was taken directly to the operating theatre instead of for further imaging studies, as such the source of intra-abdominal free fluid seen on bedside ultrasound was only identified at the time of operation.

Contributors AG and CBB were involved in initial patient assessment and management and have written the case report. GC was the consultant who reviewed the patient, was involved in instigation of subsequent management plan; bedside ultrasound study and reviewed the final manuscript.

Competing interests None.

Patient consent Obtained.

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Learning points

- Rupture of a splenic artery aneurysm is a rare diagnosis; however, in young women, it is an important diagnosis to consider once ectopic pregnancy has been excluded.
- Bedside ultrasound imaging is a highly valuable investigation, especially for patients in whom transfer for CT scanning could result in potentially life-threatening delays to definitive treatment. Focused ultrasonography should be used only if immediately available, with the optimal management of such patients with abdominal pain and hypovolaemia unresponsive to fluid resuscitation being transfer directly to theatre for laparotomy.
- CT angiography and arterial embolisation are potential options in haemodynamically stable patients or those responsive to initial resuscitative measures who can safely be transferred for CT scanning.
- Muscle relaxants required for intubation can cause loss of tone of the anterior abdominal wall musculature with an immediate loss of the tamponading effect. This can cause sudden cardiovascular collapse and as such these patients should not be intubated in the emergency department.

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