

Picture Quiz: Answers

An Unusual Cause of Abdominal Pain and Anaemia

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Key Learning Points

- The causes for anaemia can be multi-factorial - a falling haemoglobin in the face of transfusion is highly suspicious of blood loss
- Blunt trauma to the abdomen can result in splenic injury – especially when associated with splenomegaly
- Following the finding of free fluid in the abdomen and unexplained blood loss, always consider intraperitoneal bleed. Free fluid in the abdomen and unexplained blood loss always consider intraperitoneal bleed
- Have a low threshold for imaging – early diagnosis with CT facilitates early treatment
- Shoulder pain can be a red herring – or associated with haemoperitoneum
- Workup and differential diagnosis of anaemia, haemolysis, splenomegaly and ascites – think lymphoma

Answers

1. The CT scan shows massive hepatosplenomegaly, with moderate volume haemoperitoneum from splenic rupture, and multiple prominent abdominal lymph nodes (Figure 2).
2. Massive blood loss (haemoperitoneum) and haemolysis.
3. Splenic rupture (likely traumatic) predisposed by splenomegaly due to splenic lymphoma.
4. Blood product support, emergency splenectomy.

Case Outcome

An urgent surgical opinion was sought and he underwent an emergency splenectomy (both diagnostic and therapeutic). Intra-operatively he required eight units of red cells and four units of fresh frozen plasma. Subsequent pathological examination of the spleen revealed low-grade B-cell non-Hodgkin's lymphoma in keeping with splenic marginal zone lymphoma (Figure 2). The significance of lymphocytosis on admission bloods was appreciated retrospectively. Post-operatively, lymphoma cells appeared in significant numbers in his peripheral blood. He required intensive care admission post operatively. He was discharged home on day 19, with initiation of post-splenectomy prophylaxis.

Discussion

Non-Hodgkin's lymphomas are a heterogeneous group of lymphoproliferative malignancies that can be classified into low- or high-grade, precursor or mature, B-cell or T-cell types. It can present in variable ways, for example, with lymphadenopathy, hepatosplenomegaly and systemic symptoms. While the spleen may be involved by node-based or other lymphomas, primary splenic lymphomas are rare.

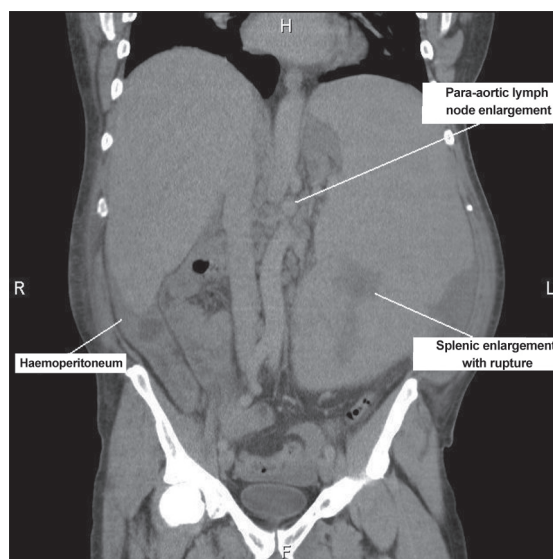


Figure 2. Computed tomography scan: Coronal view (annotated version).

This gentleman presented with a haemoglobin of 6.5 g/dl, with no evidence of external bleeding. There was evidence of haemolysis (direct Coombs' test positive, raised reticulocytes, lactate dehydrogenase and bilirubin). Despite transfusing two units of red cells, his haemoglobin dropped further, suggestive of ongoing blood loss.

The spleen is highly vascular and is the organ most commonly injured as a result of blunt abdominal trauma, with occasionally associated splenic rupture, infarction, haemorrhage and shock.^{1,2} Splenic rupture can occur with or without trauma, and certain risk factors are recognised including male sex, adulthood, and severe splenomegaly.^{3,4} Splenic infarction is more likely with increased splenic mass and oxygen requirements.⁵ Haematological disorders

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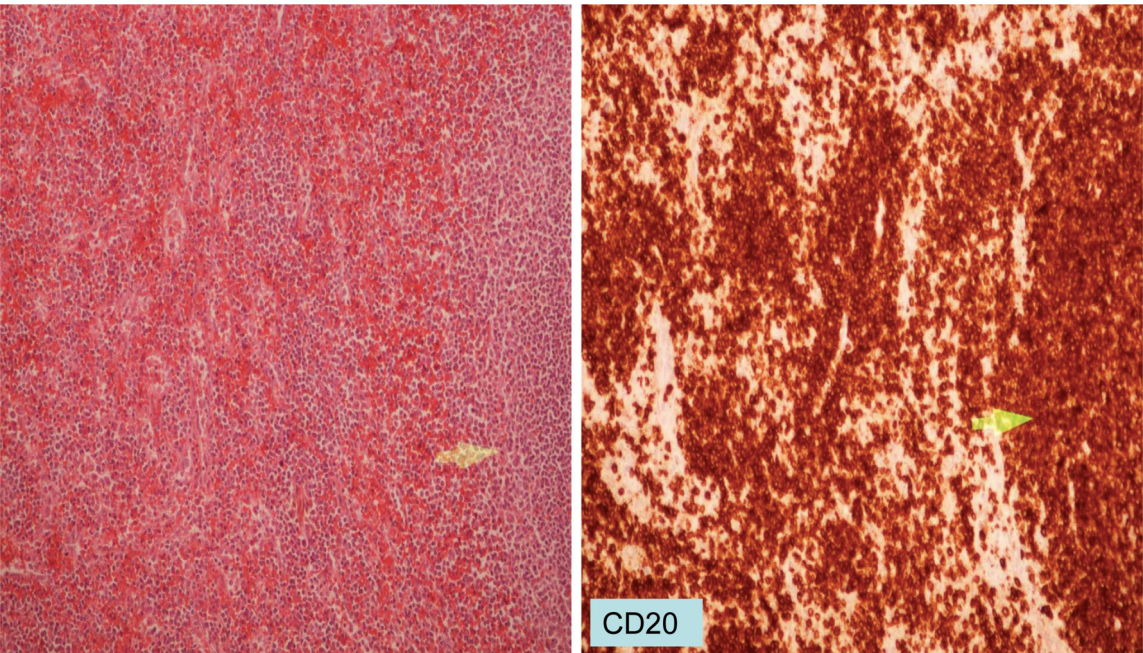


Figure 3. Histology of the spleen.

Table 2. Splenic Injury Scale (*Advance one grade for multiple injuries up to grade III) (AIS: Abbreviated Injury Scale)¹⁰

Grade*	Injury Description		AIS-90
I	Haematoma	Subcapsular, <10% surface area	2
	Laceration	Capsular tear, <1cm parenchymal depth	2
II	Haematoma	Subcapsular, 10-50% surface area Intraparenchymal, <5cm diameter	2
	Laceration	1-3cm parenchymal depth not involving a parenchymal vessel	2
III	Haematoma	Subcapsular, >50% surface area or expanding Ruptured subcapsular or parenchymal haematoma Intraparenchymal haematoma >5cm	3
	Laceration	>3cm parenchymal depth or involving trabecular vessels	3
IV	Laceration	Laceration of segmental or hilar vessels producing major devascularisation (>25% of spleen)	4
V	Laceration	Completely shattered spleen	5
	Vascular	Hilar vascular injury which devascularises spleen	5

can cause splenomegaly with associated capsular thinning, making seemingly minor trauma result in major splenic injury and rupture.⁶ Furthermore, with splenomegaly, part of the spleen may expand below the rib cage, consequently eliminating any mechanical protection from the ribs.^{7,8} In a review of 136 cases of pathological splenic rupture since 1861, 34% of cases occurred in non-Hodgkin’s lymphomas.⁴

Delayed splenic rupture is a rare but recognised event.^{1,2} A case with a 5-year interval between trauma and diagnosis of splenic rupture has been reported.⁹ The Ebstein-Barr virus is a recognised cause of splenic rupture, and could form part of the workup.

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The Splenic Injury Scale helps evaluate the degree of splenic injury, guiding management decisions, such as whether to undertake operative or non-operative management (Table 2).¹⁰ Advantages of splenic preservation have been realised, and nonoperative management is safe in some cases,^{11,12} recognising that splenectomy brings a risk of lifelong risk of sepsis.¹³

Shoulder pain can be a ‘red herring’. Following his fall, this patient complained of right shoulder pain, which was attributed to muscular injury. However, an alternative explanation is that of diaphragmatic irritation secondary to haemoperitoneum. Kehr’s sign is pain referred to the left shoulder from left

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diaphragmatic irritation, classically due to splenic rupture.^{1,14,15} Balance's sign (percussion dullness or a palpable tender mass in the left upper quadrant) has also been described.^{1,14}

Emergency ultrasound helps confirm splenomegaly and free fluid, but a computed

tomography scan is necessary to confirm splenic rupture. If there is a suspicion of haemoperitoneum, a low threshold for organising early imaging can facilitate early diagnosis, minimising time to therapeutic intervention.⁷

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