

Case report

A teenager with life-threatening abdominal pain

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A previously healthy 17-year-old boy was admitted to our emergency department for fever, pharyngitis with cervical lymphadenopathy, abdominal pain, and vomiting for three days. On admission, he was afebrile and his vital signs were normal. Yet, following another vomiting episode, he developed another bout of abdominal pain. C-reactive protein was normal, haemoglobin 14.1 g/dl, WBC $15 \times 10^3/\mu\text{L}$, platelets $138 \times 10^3/\mu\text{L}$, AST 522 U/L, ALT 341 U/L, total bilirubin 4.75 mg/dl, with direct bilirubin 3.4 mg/dl; LDH level 689 U/L.

Along with these initial findings, we focused on left side abdominal pain, abruptly strong without initial evidence of compromised vital signs, however, our patient's serious clinical conditions led us to obtain abdominal imaging, that is abdominal ultrasonography (US) and later abdominal computed tomography (CT) (Figure 1).

Questions

- Which is the most evocative diagnosis?
 - Cholecystitis
 - Hepatitis
 - Spontaneous splenic rupture during Epstein-Barr virus (EBV) infection
 - Acute pancreatitis.
- Which imaging is ideal for the diagnosis?
 - the Abdominal US



Figure 1: Abdominal computed tomography scan with contrast (coronal cut).

- Abdominal CT scan with intravenous contrast in the portal venous phase
 - Abdominal magnetic resonance with intravenous contrast in the arterial phase
 - Abdominal CT scan.
- How should this patient be managed?
 - Intravenous fluids



- B) Conservative approach with embolization treatment
- C) Intravenous fluids and analgesic treatment
- D) Surgery.

Answers

1. C.

The clinical picture on admission and his sudden worsening pointed our attention to a possible acute abdomen. The association with pharyngitis and elevated AST/ALT raised the hypothesis of spontaneous splenic rupture during acute EBV infection.

Atraumatic splenic rupture accounts for only 3% of splenic ruptures; suspecting splenic rupture is of paramount importance because of its high mortality rate, around 9% [1,2]. Causes of spontaneous rupture also include cancer, anticoagulant medications, or cocaine use but the primary cause is acute EBV infection.

Infectious mononucleosis (IM) is usually a benign, self-limiting illness; younger patients often have a milder course, with the only exception of subjects with congenital immune deficiency. Splenic rupture is thus the leading cause of death [3,4].

The diagnosis of EBV infection starts with non-specific laboratory findings, notably lymphocytosis which is included in the Hoagland criteria, and hyper-transaminasemia.

Specific laboratory tests include the monospot test, the first-line investigation for IM recommended by the NICE guidelines in patients older than 12 years, with a sensitivity of 81–95% and specificity of around 100% [1,5,6]. When monospot is negative, EBV-specific serology may offer higher sensitivity: notably, IgM antibodies are detectable for 4 months from the onset.

Splenic rupture is a rare but potentially life-threatening complication of IM, occurring in 1–2/1000 cases. Typical manifestations are abdominal pain and/or a falling hematocrit. It may occur from four days to eight weeks after IM onset [7]. A classic sign of a ruptured spleen is the left shoulder pain, known as Kehr's sign which is seen in 50% of cases.

In this case, abdominal pain had been present for three days and hemoglobin level did not fall. Yet, observing the teenager while vomiting with an extraordinarily strong effort of the abdominal musculature, leads us to suspect that a splenic rupture may have occurred during observation at the emergency room. Confirmation of EBV infection only came later.

2. B.

An immediate and careful diagnostic imaging test is recommended when an acute abdomen is suspected. Thus, an abdominal CT scan with intravenous contrast appears most appropriate and is what we applied.

3. A, B, C, D, all answers could be correct.

The management of splenic rupture is similar to other forms of splenic injury. Conservative treatment with intensive supportive care and splenic preservation is preferred, but some cases may require splenectomy [5].

Sudden worsening of patients' clinical conditions suggested emergency splenectomy in our patient. Conservative treatment was not considered since the patient was not stable and embolization was not likely safely to be performed. Massive hemoperitoneum resulted from bleeding of the inferior spleen pole. Severe splenomegaly (25 cm x 15 cm) and hepatomegaly without macroscopic related lesions were noted. Splenomegaly is reported in over one-half cases of atraumatic splenic rupture [1]. The mortality rate ranges from 7.4% in emergency splenectomy, to 4.4% in the conservative approach [8].

Patient outcome and follow-up

His clinical course was uneventful and he could be discharged on day six without any additional specific therapy, and was put on penicillin (PCN) prophylaxis, that is PCN VK 250 mg by mouth twice daily (or amoxicillin 500 mg by mouth twice daily) [9]. Moreover, our patient was referred to the Vaccination Centre of Pescara Hospital after discharge.

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