Introduction

To present several non-traumatic acute conditions including splenic infarction, splenic torsion, infections, abscesses and some unusual conditions. We agree with that the pathologic changes of the spleen are an unsuspected cause of acute abdomen, and contribute to the mortality from missed prompt diagnosis of the lesions. We think that general radiologists should be aware of the life-threatening condition - non-traumatic splenic rupture (NTSR) [1-3]. The clinical manifestations in all patients were with the variable degrees of abdominal pain and hypotension, followed by vomiting, and peritonism, combined with haemodynamic shock. [4-6].

Material and Methods

During the last 5 years at our hospitals we had at least 36 cases of non-traumatic splenic rupture. The clinical manifestations in all patients were with the variable degrees of abdominal pain and hypotension, combined with haemodynamic shock. [4-6]. All of these patients are examined at the department of Imaging Diagnostic of the University Hospital. Then they are discussed at clinico-radiological meetings to take adequate diagnostic and therapeutic behavior. Thoracoabdominal US examination, MDCT, and rarely MRI were used. The dominant role in diagnosis was of the multidetector computed tomography (MDCT).
RESULTS AND DISCUSSION

From 2013 to 2018 years at our hospital we encountered at least 36 cases of non-traumatic splenic rupture. After clinical investigation and diagnostic imaging examination the obtained results was: in 8 cases - splenic infarction, in 6- aneurysms and pseudoaneurysms, in 7 - arterial and venous thrombosis, in 2 - splenic torsion, , in 5- infections and abscesses and in 8 patients- lymphoma and solid tumours.

Ultrasound usually is used for initial investigation method with suspicion of splenic injuries. Nevertheless the accurate initial diagnosis based solely on US findings is limited. Differentiation of splenic hematoma from abscess or infarct may not be reliably made by US (Fig.1and 2)

Computed tomography (CT) is the method of choice in the assessment of splenic injuries especially MDCT. CT demonstrate any parenchymal changes related to traumatic and nontraumatic conditions. Furthermore a CT scan in arterial phase with addition to portal venous phase, increases the possibilities of detection of splenic vascular injuries (Fig.3)

Very uncommonly “idiopathic” rupture may occur in a normal spleen. The two hypothesized mechanisms involve: (a) intrasplenic cellular or reticuloendothelial hyperplasia leading to vascular occlusion, and (b) compression by the abdominal musculature during physiological activities such as sneezing, coughing, or defecation. Idiopathic ASR may be suggested when hemoperitoneum and high-grade splenic injury occur without CT imaging evidence of splenomegaly, focal masses, or splenic lesions. The diagnosis is generally confirmed by negative viral serology and normal spleen at gross inspection and histology [4, 6-8].

In 10 of all 36 patients the splenic bleeding was observed secondary to anticoagulation therapy (Fig.4).
Depending on the patient’s haematocrit, recent extravascular blood measures at 35 to 60 Hounsfield Units (HU) of attenuation, and becomes even denser (60-80 HU) from clotting within a few hours (Fig. 6). CT reliably allows detecting coexistent haemoperitoneum and ongoing bleeding. Haemoperitoneum is heralded by higher-than-water attenuation (30–45 HU) peritoneal effusion, often with a mixed appearance or fluid-fluid level. Noncontained active haemorrhage appears as serpiginous or jet-like extravasation of injected contrast medium, which follows the attenuation of blood vessels in all acquisition phases and generally progresses from the arterial to the venous phase. Finally, CT allows the differentiation of NTSR from other rare non-traumatic causes of abdominal haemorrhage including ruptured liver (mostly hepatocellular adenoma or carcinoma rather than metastases) or kidney (particularly angiomyolipomas) tumours, visceral aneurysms and pseudo-aneurysms, and gynecologic conditions such as ectopic pregnancy, ruptured corpus luteum cysts.

Treatment guidelines for splenic injury from blunt abdominal trauma cannot be directly applied to NTSR, since the latter commonly occurs in a diseased spleen and patients are generally older than those experiencing traumas. The correct therapeutic choice should consider the presence of haemodynamic instability, the amount of blood products used, the degree of haemoperitoneum, the underlying pathology, and the extent of splenic damage. As is well known to radiologists who are familiar with polytrauma imaging, multidetector CT is crucial in this setting as it detects active bleeding, and reliably measures and categorises splenic injuries according to scale as either subcapsular and intraparenchymal hematomas(Figure 6), variably deep parenchymal and/or capsular lacerations, or devascularisation and fragmentation.

The majority (over 80 %) of reported NTSR cases are treated surgically, and splenectomy remains the treatment of choice for patients with underlying malignancies. However, similarly to low-grade splenic traumas in haemodynamically stable patients, there is an increasing trend towards non-operative management for NTSR as well, which achieves a high (80 %) success rate with correct patient selection. Conservative treatment including bed rest, intravenous fluids, and blood transfusions is particularly appealing in young and pediatric patients with acute infections, since preserving the spleen prevents long-term infectious morbidity. Strict clinical, laboratory, and imaging monitoring is required during nonoperative management: multidetector MDCT consistently allows assessment of changes in size and attenuation of haematomas over time [4, 5, 8, 16, 17]. Albeit operator-dependent and lacking panoramicty, the use of contrast-enhanced ultrasound allows younger patients to avoid irradiation from repeated CT studies .

Increasingly adopted to manage traumatic splenic injuries, interventional treatment with transcatheter arterial embolisation (TAE) may also prove a valuable nonsurgical option for NTSR, particularly in cases associated with anticoagulation, malaria, and mononucleosis, and when CT detects active arterial bleeding [2, 17].

In selected patients, TAE is useful as a temporary stabilising measure. Combined with intensive care, interventional radiology may allow a more rapid and safer haemostasis than surgery alone.

Early imaging diagnosis of NTSR is warranted to limit mortality and to provide correct triage between surveillance, interventional, and surgical treatment.

Ultrasound is a quick, noninvasive first-line technique to detect hemoperitoneum, which appears as complex hypoechoic effusion with regions of increased echogenicity. However, borrowing from experience in trauma, ultrasound has moderate sensitivity for the detection of splenic rupture. Furthermore, sonographic evaluation may be limited by large body habitus and bowel gas, has limited specificity due to the variable echogenicity of abscesses and hematomas, and does not provide a panoramic investigation of the entire abdomen and pelvis(Fig.7) [2, 3, 16, 17].

The prognosis of NTSR is generally related to the underlying disease. The non-negligible fatality rate approaches 15 % of patients. Risk factors associated with increased NTSR-related mortality include splenomegaly, advanced age, and neoplastic disorders [8].

CONCLUSION

In our opinion, general radiologists and emergency physicians should be well aware that splenic rupture with or without hemoperitoneum may occur in the absence of trauma and of previously diagnosed diseases involving the spleen. NTSR should be strongly suspected when acute abdominal manifestations occur in young patients with acute infections, or in the setting of haemopoietic and lympho-reticular disorders.

We believe that due to availability and extreme acquisition speed, multidetector CT represents the imaging modality of choice to assess patients with acute abdomen and signs of hemodynamic instability. Since physical signs are often unclear and laboratory findings do not accurately reflect the entity of bleeding, CT is warranted to investigate suspected intra-abdominal bleeding [3, 12].
References


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