



Spontaneous rupture of normal spleen: A diagnostic dilemma

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ABSTRACT

Spontaneous rupture of normal spleen poses a diagnostic dilemma for the treating clinician. Bacterial, viral, or parasitic infection, and malignancy of the spleen are predisposing factors for atraumatic spontaneous rupture. Severe and sudden pain in the left upper abdomen with radiation to the left shoulder is the most common presenting symptom. Ultrasonography (USG) and computed tomography (CT) are important diagnostic imaging modalities. Here we present the case of a 60-year-old female who presented with severe upper left abdominal pain just after a heavy meal. Emergency USG diagnosed the patient as a case of ruptured spleen and it was further confirmed with contrast enhanced computed tomography (CECT) and paracentesis of perisplenic collection. The patient was managed conservatively with success.

Key words: Spontaneous rupture, spleen, infection, malignancy

Introduction

Idiopathic rupture of the normal spleen is an uncommon surgical condition. As there is no history of trauma, diagnosis is usually delayed. Mostly diseased spleen (with infection or with neoplasm) can rupture spontaneously without trauma. Bacterial, viral, and parasitic infection of the spleen predisposes the spleen to atraumatic rupture. Rarely, even a physiologic event, such as severe coughing or vomiting, which causes a sudden increase in intra-abdominal pressure, can rupture the normal splenic capsule. The usual presenting symptom in these patients is severe upper left abdominal pain, which may or may not refer to the left shoulder. These patients can also present with hypotension

[1,2]. Here, we present a case of a 60-year-old female who presented with upper left abdominal pain just after heavy meal. Emergency ultrasonography (USG) diagnosed the case as splenic rupture with perisplenic collection. It was further confirmed with contrast enhanced computed tomography (CECT) and USG-guided paracentesis of perisplenic collection. As the patient was hemodynamically stable, the patient was managed conservatively to salvage the spleen.

Case Report

A 60-year-old female presented with severe, sudden onset of pain in her left upper abdomen radiating to her left shoulder. She was a known case of diabetes mellitus for the last 8 years. She gave no history of trauma

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preceding the onset of the pain. There was no history of anticoagulant drugs therapy in the recent past. There was no history of heaviness in the left hypochondrial region before this pain.

Physical examination revealed that the patient had low-grade fever. Examination of the abdomen revealed an indistinct, non-tender, non-pulsatile mass in her left hypochondrial region. There was neither audible bruit over mass nor cutaneous ecchymoses (Turner's Sign). Blood investigations were normal except for low hemoglobin (8g/dl) and high blood sugar level. Emergency USG showed splenic tear with perisplenic collection, which was confirmed by CECT (Figure 1,2). The patient was hemodynamically stable. To confirm the diagnosis, USG-guided paracentesis was done which revealed altered blood (50 ml). Two units of blood were given and diabetes mellitus was controlled with the use of insulin. Hemoglobin level improved (10g/dl). As the patient was hemodynamically stable, she was managed conservatively to salvage the spleen. As lower-grade fever was due to subcapsular hematoma, the patient was advised to take an antipyretic drug if her temperature rose above 100°F.

Subsequent USG carried out after 6 weeks revealed complete absorption of perisplenic collection. During the follow-up period, fine needle aspiration cytology (FNAC) of the spleen was done to rule out any pre-existing splenic parenchymal disease. Normal splenic parenchymal pattern was observed on the FNAC slide (Figure 3).

Discussion

The term "spontaneous splenic rupture" is uncertain so far [3]. Wiedemann described it as a rupture occurring due to "incident without external force". Knoblich differentiated the non-traumatic rupture of a diseased spleen from the non-traumatic normal splenic rupture of unknown source [4]. The first case of atraumatic splenic rupture in a leukemic patient was described by Rokitansky in 1861 and in a normal spleen by Atkinson in 1874 [5,6]. Incidence of spontaneous rupture of the spleen is approximately 1% of all splenic ruptures and is more common in males (but our patient was a female) [6].

Mostly, these patients present with the severe upper left quadrant abdominal pain. The pain may refer

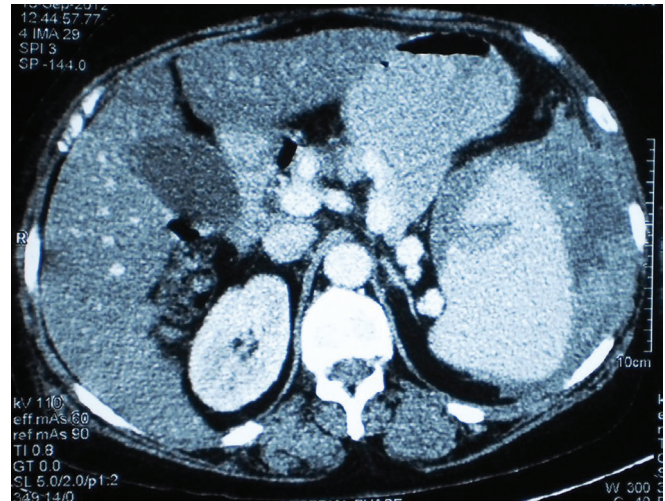


Figure 1. CECT showing splenic tear with perisplenic collection (axial view).



Figure 2. CECT showing perisplenic collection (coronal view).

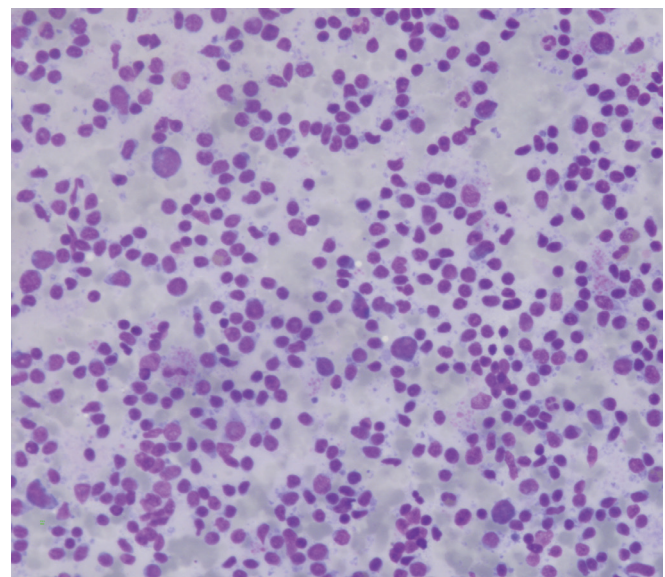


Figure 3. Slide showing normal splenic parenchymal pattern.

to the left shoulder (Kehr sign). Pain may be associated with nausea, vomiting, low blood pressure, and sometimes shock. When there is suspicion of splenic rupture, USG is an easily available imaging modality in these hemodynamically unstable patients. USG signs of splenic rupture are enlargement, displacement, double contour, irregularity of the spleen, and intraperitoneal fluid [7]. Sensitivity of USG to identify free intra-abdominal fluid is approximately 98–100%. USG can diagnose splenic parenchymal lesions such as splenic rupture with 72–78% sensitivity and with 91–100% specificity [8]. CT is mandatory for staging the splenic rupture and helps in choosing the nature of surgery.

The four-step criteria for diagnosis of spontaneous rupture are: no history of trauma, no adhesions around spleen (common in old trauma cases), disease-free spleen, and normal spleen on gross and on histological examination [9]. The fifth criterion is “spleen without viral infection” and no antiviral antibodies in blood [10]. In our case, there was no history of heaviness in the left hypochondrial region, of trauma, or of splenic disease, or history suggestive of viral infection. All hematological tests were normal and there was no evidence of infection such as high antiviral antibodies titer. There was a splenic tear on CECT. Altered blood was aspirated on USG-guided paracentesis of perisplenic collection; so, diagnosis of spontaneous rupture of the spleen was made. We could not do gross and histopathological examinations of the spleen as the patient was managed conservatively to salvage the spleen as she was hemodynamically stable.

Many explanations have been suggested to clarify spontaneous rupture of the normal spleen. The most-believed suggestion is existence of a small patch of limited disease that does not leave any mark on the spleen. Other theories are chronic passive congestion, rapid dissection, degenerative changes, or atherosclerosis of the splenic artery due to aging and diabetes mellitus (may be in our case). Even increased intra-abdominal pressure due to abdominal muscle contraction can very rarely result in spontaneous rupture of the spleen.

Usually these patients complain of moderate- to low-grade fever due to the effect of tumor necrosis factor-alpha and interleukin-1 and -6 in reaction to the presence of hematoma around the spleen. Pyrexia

settles down after re-absorption of hematoma by macrophages. The Usual period of re-absorption is 6 to 8 weeks and varies with the amount of blood collection. In our patient complete absorption of hematoma took approximately 6 weeks. So, such patients should not be put on a prolonged course of antibiotics in the follow up period due to low-grade fever.

Due to very high chances of post-splenectomy infection, a conservative approach should be used in all cases that otherwise require total splenectomy. Total splenectomy should be avoided as long as possible as occasionally splenic rupture can heal spontaneously [11]. Size and numbers of splenic tears, presence of shock, and prognosis of patients guides the management of splenic rupture. The amount of blood loss together with the physiologic reserve of the patient will determine if shock is an initial clinical presentation or not. As our patient was hemodynamically stable, we managed her conservatively to save the spleen. The incidence of splenectomy for spontaneous splenic rupture is about half in comparison with that of traumatic splenic rupture because the nature of injury is of low force [12]. Repeated USGs are essential for evaluation of ruptured spleen, as CT has radiation hazards.

The mortality rate in conservatively treated ruptured spleen patients is approximately 22% after 30 days and overall perioperative mortality rate is approximately 18% [13]. Supplementary abdominal complications are the cause of the high rate of mortality in these patients. Intrasplenic pseudoaneurysm (12.2%) and functional asplenia (7%) are uncommon complications of splenic rupture [14,15].

Conclusion

Spontaneous splenic rupture is an uncommon entity. It is usually related to enlarged spleen and is common in males. Patients who present with acute left subcostal pain with radiation to the left shoulder can be a case of splenic rupture and a high index of suspicion is necessary in such patients. USG should be done immediately to identify splenic rupture followed by CECT to confirm the diagnosis. Management depends upon the hemodynamic status. Ideally, the spleen should be salvaged.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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