**Spontaneous Splenic Rupture in a Young Male : A Case Report**

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**ABSTRACT**

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| **Spontaneous splenic rupture (SSR) is a rare but potentially life-threatening surgical emergency that usually arises in association with underlying splenic pathology, such as infections, hematologic malignancies, or trauma. Here, we report a rare case of spontaneous splenic rupture in a previously healthy 23-year-old male presenting with acute right iliac fossa pain, clinically mimicking perforated appendicitis. Unexpected intraoperative findings of significant hemoperitoneum originating from the splenic hilum necessitated conversion to laparotomy and splenectomy was performed. Histopathology revealed no underlying pathology, classifying this case as idiopathic SSR. This case underscores the need for surgeons to maintain a high index of suspicion and intraoperative adaptability in acute abdominal presentations.** |

*Keywords: Spontaneous splenic rupture, hemoperitoneum, splenectomy, appendicitis, laparoscopy, acute abdomen.*

**1. INTRODUCTION**

Spontaneous splenic rupture (SSR), also referred to as atraumatic splenic rupture (ASR), is an uncommon but life-threatening condition [5]. It is typically associated with underlying splenic pathology such as infections, hematologic malignancies, or autoimmune diseases [6,7]. However, in rare instances, SSR can occur in otherwise healthy individuals, making preoperative diagnosis extremely challenging.

SSR presents a diagnostic dilemma, as its clinical manifestations overlap with other causes of acute abdomen, including appendicitis and perforated viscus [8]. Left untreated, SSR can lead to massive hemorrhage, hypovolemic shock, and death. This case report illustrates an atypical presentation of SSR, initially misdiagnosed as perforated appendicitis, emphasizing the need for intraoperative vigilance and adaptability in surgical decision-making.

**2. CASE PRESENTATION**

A previously healthy 23-year-old Malay male presented to the emergency department with sudden-onset, progressively severe right iliac fossa pain over one day. He reported no trauma, fever, vomiting, gastrointestinal bleeding, recent illness, or weight loss.

Clinical Examination Vitals were as follows: afebrile, tachycardic, normotensive, with an oxygen saturation of 98%. Examination revealed marked tenderness and rebound tenderness localized to the right iliac fossa, positive Rovsing’s sign, and no guarding or palpable masses. The left upper quadrant exhibited no tenderness, and typical signs of splenic injury (Kehr’s and Balance's signs) were absent.

Investigations Laboratory tests showed an elevated white blood cell count (WBC: 24 × 10⁹/L), normal hemoglobin (Hb: 12.4 g/dL), and normal platelet, coagulation, liver, and renal profiles. Abdominal and chest X-rays were normal. A preoperative CT scan was not performed due to strong clinical suspicion of appendicitis.

Operative Findings : A laparoscopic appendicectomy revealed approximately 1.2 liters of fresh hemoperitoneum and a normal appendix without inflammation or perforation. Bleeding was identified originating from the splenic hilum, with no adhesions, masses, or infarcts noted. Due to ongoing hemorrhage and hemodynamic instability, the procedure was converted to open laparotomy, and emergency splenectomy was performed.

Postoperative : Recovery was uneventful, and the patient was discharged on postoperative day four. Histopathological analysis confirmed hemorrhagic necrosis without underlying pathology. The patient received recommended post-splenectomy vaccinations and follow-up guidance.

**3. DISCUSSION**

SSR is extremely rare, representing 0.1- 0.5% of all splenic ruptures, with mortality rates up to 12.2% if untreated(1). A systematic literature review conducted between 1980 and 2008, encompassing 632 publications and 845 patient cases, identified six primary etiological categories: neoplastic conditions (30.3%), infectious diseases (27.3%), non-infectious inflammatory disorders (20.0%), drug- or treatment-related causes (9.2%), mechanical factors (6.8%), and cases involving a normal spleen (6.4%). The last category was designated as “atraumatic–idiopathic splenic rupture.”(1)

Diagnosis typically follows the Orloff and Peskin criteria which include:

1. No history of trauma or external force.
2. No perisplenic adhesions suggesting prior trauma.
3. No evidence of splenic disease in histopathology.
4. A normal spleen macroscopically and microscopically.

Our patient fulfilled all these criteria, making this an extremely rare case. Although infections and hematologic disorders commonly cause SSR, idiopathic cases occur in approximately 5% of instances(2). Proposed mechanisms include increased intrasplenic tension due to congestion or hyperplasia, vascular occlusion leading to infarction, and sudden abdominal pressure changes.(4)

Clinically, SSR often presents nonspecifically, making diagnosis challenging. Left upper quadrant pain, nausea, vomiting, and hemodynamic instability are common, but atypical presentations, such as right iliac fossa pain, can mimic appendicitis, as observed here. Misdiagnosis can lead to delayed treatment and increased morbidity.

Contrast-enhanced CT remains the gold standard for diagnosis, effectively demonstrating splenic injury and hemoperitoneum. However, its omission in emergencies with high suspicion of other acute conditions underscores the challenge of timely diagnosis. Magnetic resonance imaging (MRI) has been investigated as a diagnostic tool for visceral injuries, including splenic rupture. Although computed tomography (CT) remains the preferred method in acute situations due to its rapid imaging and ability to identify active bleeding, MRI provides superior soft-tissue contrast. This makes it valuable in cases where CT results are inconclusive or when minimizing radiation exposure is important, such as in pregnant patients or those requiring multiple scans (9). MRI is especially effective at detecting subtle soft-tissue damage, including small intraparenchymal hemorrhages and minor capsular tears. Nonetheless, its application in acute care is limited by longer scan times, the need for patient stability, and reduced availability compared to CT (10). Rapid diagnostic modalities, such as ultrasound or FAST scans, can aid in emergent settings. (3)

Management of SSR largely depends on patient stability and injury severity. Hemodynamically unstable patients require immediate splenectomy, necessary in approximately 84% of SSR cases(1). Conversely, stable patients with minimal hemorrhage may benefit from nonoperative management (NOM), including angioembolization and close monitoring, although this approach is less common due to SSR's unpredictable progression. Although there are no standardized guidelines for managing spontaneous splenic rupture (SSR), total splenectomy is generally recommended when SSR is associated with a neoplastic condition. In contrast, conservative treatment is preferred when the rupture is due to an infectious cause.

Performing a total splenectomy, even in hemodynamically stable patients, can be justified for several reasons. Firstly, histological analysis of the spleen can help determine the cause of atraumatic splenic rupture (ASR) and reveal any underlying systemic disease. Secondly, ASR is often associated with malignant conditions, which typically rule out spleen-preserving options. Thirdly, pathological changes or infiltration of the splenic tissue may already impair splenic function, leading to functional hyposplenism. In such cases, removing a non-functional spleen is reasonable and does not significantly increase the risk of overwhelming post-splenectomy infection.(1)

Postoperative management emphasizes infection prevention through vaccinations against encapsulated organisms, given the increased risk post-splenectomy. In the prevention of infections among splenectomized individuals, patient education—alongside vaccination and antibiotic prophylaxis—plays a critical role. Indeed, patient education is often regarded as a cornerstone, if not the most pivotal component, in reducing the incidence of overwhelming post-splenectomy infection (OPSI). It is essential that individuals who have undergone splenectomy receive comprehensive guidance regarding their altered immunological status, the associated heightened susceptibility to infection, strategies for infection prevention, and the appropriate actions to take in the event of febrile illness or suspected infection (11). Prompt identification and timely intervention significantly improve outcomes, highlighting the importance of surgical vigilance and adaptability in atypical acute abdominal presentations.

**4. CONCLUSION**

This case highlights the importance of considering SSR in acute abdomen presentations, even in the absence of trauma. The lack of specific signs and overlap with common conditions such as appendicitis can lead to delayed diagnosis and mismanagement. Intraoperative vigilance, rapid intervention, and timely splenectomy are critical for optimal patient outcomes.

**Consent**

As per international standards , patient written consent has been collected and preserved by the authors

**Ethical approval**

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

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