Spontaneous Splenic Rupture in a Case of Infectious Mononucleosis

Suresh MK\(^1\), Sreenath S\(^2\), Vijay Narayanan H\(^2\)

Abstract
Infectious Mononucleosis is a common viral illness mainly of adolescent-young adult age group. Spontaneous splenic rupture is a rare but potentially fatal complication of Infectious Mononucleosis occurring in less than 0.5% of the cases. A high index of suspicion especially if abdominal pain develops during Infectious Mononucleosis is very crucial to early diagnosis and intervention in the case of rupture. Here we discuss the case of a 24 year old male with no previous comorbidities and stable vitals who presented with febrile illness of one week duration associated with abdominal discomfort. Even though initial evaluation did not point towards any etiological clues, a CT imaging of the abdomen was opted due to his persistent abdominal symptoms which showed features suggestive of a contained rupture of spleen. The lack of a specific trauma history prompted further workup for an infective etiology and patient was subsequently found to be positive for Epstein Barr Virus antigen and was diagnosed to have Infectious Mononucleosis. Rupture being of lower grades, non-operative management was opted for and patient improved with conservative management over 4-8 weeks with no further complications. We also discuss the internationally accepted grading of splenic injury and the general consensus regarding management of the same. A general search of the available literature showed very few cases of spontaneous splenic rupture in Infectious Mononucleosis being reported especially from India and hence the importance of this case.

Introduction
Infectious Mononucleosis, caused by Epstein Barr Virus, a member of the Herpesviridae family, is a common infection of worldwide significance, with more than 90% individuals having been infected by adulthood.\(^1\) Infectious Mononucleosis most often presents with nonspecific symptoms such as sore throat, malaise, headache and abdominal pain. Most cases are self-limited-one of the most feared complications, though rare and occurring in less than 0.5% of cases, is splenic rupture. Splenic rupture occurs more commonly in male patients and requires a high index of suspicion for early diagnosis.\(^1\)

The presentation of splenic injury can vary, and may manifest as abdominal pain, referred left shoulder pain (Kehr’s sign) or hemodynamic instability.\(^1\)

Computer-aided tomography (CT) of the abdomen and pelvis with intravenous (IV) contrast is the preferred imaging modality for stable patients with suspected splenic injury, while focused assessment with sonography in trauma (FAST) should be used for unstable patients.\(^2\)

Due to the overwhelming risk of post splenectomy infection, there has been a shift away from operative treatment of splenic injury. Non-operative management has become the standard of care in hemodynamically stable patients.\(^2\)

Case Report
A febrile 24 year old male from Thiruvananthapuram who was working in Middle East, presented to the emergency department with chief complaints of fever for 7 days, abdominal discomfort for 3 days. He reported the fever to be high grade associated with chills and rigor. There was no abdominal pain initially but he reported a constant dull aching pain to be present in the left flank region for past 3 days. He also noticed a yellow discoloration of eyes and urine for the past two days. He did not report any complaints of dysuria, altered bowel habits, vomiting, reduced urine output or any bleeding manifestations. He gives no history of any addictions, habituations, significant past medical illnesses or illness running in the family.

Vitals at the time of presentation consisted of a temperature of 38.2°C, pulse rate 100/min regular, respiratory rate 18/min, and blood pressure 114/72 mm of Hg and oxygen saturation 99% on room air. Physical examination findings included an alert 24 year old moderately built male who appeared comfortable and not in acute pain or distress. Bilateral posterior cervical lymph nodes were found to be enlarged with minimal tenderness on palpation. His abdomen was soft, nondistended and a tenderness was noted in the left hypochondrium. No hepatosplenomegaly was appreciated but the examination was limited due to voluntary guarding. Traubes space appeared to be dull on percussion.

Pertinent results among initial diagnostic testing consisted of an elevated total leucocyte count of 13,560, thrombocytopenia 80,000, peripheral smear showing moderate thrombocytopenia and elevated total bilirubin 2.8 (direct 0.7/indirect 2.1). Patient was managed as a case of fever with thrombocytopenia and minimal hepatic dysfunction. Chest and abdominal radiographs revealed no specific abnormalities but an ultrasound scan of the abdomen showed a hepatosplenomegaly with heterogeneous splenic parenchyma. Inspite of adequate supportive care, patient was complaining of persistent pain in the left hypochondrium with tenderness and there were occasional spikes of fever. IgM testing for

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Dengue, Leptospirosis, Scrub typhus, Brucella and Rapid Malarial Test to look or infectious process all turned out negative. Echocardiography was normal and blood and urine cultures were negative for specific pathogens. Platelet function studies were found to be within normal limits.

In view of the persisting abdominal symptoms, a CT scan of the abdomen and pelvis was ordered with IV contrast which demonstrated moderate splenomegaly, with findings compatible with contained splenic rupture predominantly involving the superior and anterior aspect with minimal subcapsular/perisplenic hematoma (Figure 1). Since there was no history of trauma, Monospot and Epstein-Barr virus panels were added to rule out possible infectious process. Monospot was negative and Epstein-Barr virus (IGG, IGM) panel demonstrated EBV VCA IGG negative, EBV VCA IGM positive, and EBV NUCLEAR AG, IGG negative.

Being a contained rupture and since patient was haemodynamically stable, after consulting with radiology and surgical departments, it was decided to treat the patient conservatively and to repeat CT scan of abdomen after 8 weeks. Patient improved symptomatically within a few weeks and was discharged with the advice to refrain from severe physical exertion for 4 weeks.

Repeat imaging (Figure 2) done after 8 weeks showed findings suggestive of a resolving splenic laceration/hematoma with size of spleen, heterogeneity of splenic parenchyma and perisplenic hematoma reduced in size compared to the previous scan.

**Discussion**

Infectious Mononucleosis is a clinical syndrome caused by Epstein-Barr virus (EBV) that is particularly common in adolescents and children. Typical features of Infectious Mononucleosis include fever, pharyngitis, posterior cervical lymphadenopathy, headache, nausea vomiting and anorexia.

Potentially serious complications from Infectious Mononucleosis include Acute interstitial nephritis, Hemolytic anemia, Myocarditis and cardiac conduction abnormalities, neurologic abnormalities, cranial nerve palsies, encephalitis, meningitis, mononeuropathies, retrobulbar neuritis, thrombocytopenia, upper airway obstruction, splenomegaly and splenic rupture. An important feature of Infectious Mononucleosis is the proliferation of mononuclear cells especially in the lymphoid tissue leading to splenomegaly which is usually reversible and thinning of splenic capsule which may lead to potentially fatal complication of splenic rupture. Splenic rupture occurs in about 0.1% of the cases and its presentation may vary from persisting right upper quadrant pain of abdomen or Kehr’s sign, which presents as left shoulder pain from the irritation of diaphragmatic nerves caused by the presence of hemoperitoneum or patient could even be in shock due to acute blood loss. A high index of suspicion is always warranted in cases of Infectious Mononucleosis with such a clinical profile to reach at a diagnosis of splenic rupture. Even though there has been a few case reports of spontaneous splenic rupture after Infectious Mononucleosis in world literature, such reports from India are quite rare and hence the importance of our case.

In our case, even though there was no appreciable hepatosplenomegaly clinically, an emergency ultrasound scan of the abdomen revealed a hepatosplenomegaly with heterogeneous splenic parenchyma. In view of persisting abdominal symptoms, a CT scan of the abdomen revealed heterogeneous hypodensities traversing splenic parenchyma predominantly along superior and anterior aspect with minimal perisplenic fluid and intact splenic capsule; features suggestive of a contained splenic rupture (Grade 1 splenic injury). Since there was no history of trauma, Monospot and Epstein-Barr virus panels were added to rule out possible infectious process. Monospot was negative and Epstein-Barr virus (IGG, IGM) panel demonstrated EBV VCA IGG negative, EBV VCA IGM positive, and EBV NUCLEAR AG, IGG negative.

**Table 1: AAST splenic injury scale (1994 revision)**

<table>
<thead>
<tr>
<th>Grade*</th>
<th>Type</th>
<th>Description of injury</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>Hematoma</td>
<td>Subcapsular, &lt;10% surface area</td>
</tr>
<tr>
<td></td>
<td>Laceration</td>
<td>Capsular tear, &lt;1 cm parenchymal depth</td>
</tr>
<tr>
<td>II</td>
<td>Hematoma</td>
<td>Subcapsular, 10%-50% surface area; intraparenchymal, &lt;5 cm in diameter</td>
</tr>
<tr>
<td></td>
<td>Laceration</td>
<td>1-3 cm parenchymal depth that does not involve a trabecular vessel</td>
</tr>
<tr>
<td>III</td>
<td>Hematoma</td>
<td>Subcapsular, &gt;50% surface area or expanding; ruptured subcapsular or parenchymal hematoma</td>
</tr>
<tr>
<td></td>
<td>Laceration</td>
<td>&gt;3 cm parenchymal depth or involving trabecular vessels</td>
</tr>
<tr>
<td>IV</td>
<td>Laceration</td>
<td>Laceration involving segmental or hilar vessels producing major devascularization (&gt;25% of spleen)</td>
</tr>
<tr>
<td>V</td>
<td>Laceration</td>
<td>Completely shattered spleen</td>
</tr>
<tr>
<td></td>
<td>Vascular</td>
<td>Hilar vascular injury with devascularizes spleen</td>
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Note: AAST=American Association for the Surgery of Trauma. *From reference 34. Advance one grade for multiple injuries up to grade III; Source: http://www.aast.org/library/traumatools/injuryscoringscales.aspx#spleen
symptoms, we suspected a splenic rupture and proceeded with a contrast enhanced CT scan of the abdomen which is the recommended imaging modality of choice in suspected splenic injuries in haemodynamically stable patients. According to American Association for the Surgery of Trauma, splenic injury is graded as per the findings of the contrast enhanced CT scan.

Contrast enhanced CT findings may include splenomegaly, hemoperitoneum or active hemorrhage, lacerations, subcapsular/intraparenchymal hematomas and pseudo aneurysms/AV fistulas. Lacerations appear as linear or branching hypodensities [6]. Subcapsular hematomas can be seen as low-density fluid adjacent to the spleen that distorts the splenic architecture. Parenchymal hematoma appears as a focal hypodense area within the enhanced splenic parenchyma with an intact capsule. Active hemorrhage appears as a high-density (80-95HU) material due to the extravasation of contrast media that do not increase in size on delayed imaging. Haemoperitoneum can be accurately detected on a CT scan when the phrenicocolic ligament to the left blood from the splenic injury passes via the paracolic gutter and the pelvis.

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