

Delayed Splenic Rupture due to an Occult Primary Injury

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ABSTRACT

Spleen, due to its unique position and relative mobility, is the most vulnerable organ in blunt abdominal injuries. After splenic trauma, hemodynamically unstable patients are treated with splenectomy. Delayed splenic rupture presents 48 to 72 hours after blunt abdominal trauma and is a rare entity. It is usually associated with low-velocity blunt injuries. The sequela is usually a minor trauma that is concealed initially and presents later as subcapsular hematoma, hemodynamic instability, abdominal pain, and positive Kehr's sign in most cases. Computed tomography is the investigation of choice in such cases. We discuss here a case of delayed splenic rupture that presented after eight weeks of a minor abdominal injury due to a fall. The patient presented with a tender left hypochondrium, positive Kehr's sign, and tachycardia. Computed tomography of the abdomen revealed delayed splenic rupture and hemoperitoneum. As the initial imaging is usually normal in these cases, a routine follow-up and close monitoring of trauma patients can help in the early detection of complications.

Key Words: *Splenectomy, Splenic rupture, Kehr's sign, Hemoperitoneum.*

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INTRODUCTION

Spleen, due to its fragility and relative mobility, is the most frequently injured solid organ in blunt abdominal injuries.¹ It may present as laceration, subcapsular, and intra-parenchymal hematoma depending upon the mechanism and degree of insult. Management of splenic trauma depends upon the grade of splenic injury which ranges from Grade I (subcapsular hematoma) to Grade V (shattered spleen).²

"Wait and see" policy in the management of splenic trauma has become a popular modality during the last decade and it has shown promising results, especially among pediatric patients. Among the sequela of non-operative management, delayed splenic rupture is the most feared one.³ Regular monitoring and careful observation are required for early detection of this grave complication.

Delayed splenic rupture is ascribed to minor falls that lead to splenic rupture 48 hours after the initial injury and is associated with high mortality. Such injuries are usually defined as "injuries in evolution" because the primary injuries are mostly inappreciable in initial investigations.⁴

Here, we report a case of a 58-year man who presented with delayed splenic rupture eight weeks after blunt abdominal injury. The patient presented with tachycardia, abdominal pain, and positive Kehr's sign. Grade III splenic injury was found on the CT scan.

CASE REPORT

A 58-year male presented in the emergency room with complaints of left hypochondrial pain and vomiting for 1 day. There was a history of minor fall and left hypochondrial injury eight weeks back, for which, he remained under observation for 24 hours and was investigated with baseline investigations, chest X-ray, and serial FAST scans. No evidence of intraperitoneal injury could be elicited then. The patient was discharged on painkillers after 24 hours. There was no history of fever and weight loss. There was no previous history of pulmonary tuberculosis. Patient was a non-smoker and non-addict. Systemic history was non-significant.

The clinical examination showed him to be a lean middle-aged man of normal build and height. Pulse rate was 124 beats/min, blood pressure, 90/50 mmHg, respiratory rate, 24 breaths/min, temperature 99°F, and cold peripheries on receiving. The abdomen was tender in the left hypochondrium, Kehr's sign was positive, hernial orifices were intact and no lymph nodes were palpable on palpation. The liver was dull on percussion and bowel sounds were absent. Per rectal examination was unremarkable.

His Hemoglobin (Hb) was 8 g/dl and total Leucocyte Count (TLC), 9000 /mm³. Renal and liver parameters were unremarkable. On chest X-ray, anteroposterior view, there was basal atelectasis on the left side. Ultrasound of the abdomen revealed free fluid in

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the peritoneal cavity. CT scan abdomen with intravenous contrast revealed a grade III injury of the spleen and hemoperitoneum (Figure 1).

After resuscitating the patient with IV fluids and blood, a laparotomy was planned and a splenectomy was performed (Figure 2). The postoperative course was smooth and the patient was vaccinated against encapsulated bacteria. The patient was found to be doing well on follow-up one week after discharge at the surgical outpatient clinic.



Figure 1: CT scan abdomen with intravenous contrast showing ruptured spleen and hemoperitoneum.



Figure 2: Gross specimen of ruptured spleen.

DISCUSSION

Splenic injury is managed in a variety of ways depending upon the grade of injury and hemodynamic status of the patient. Delayed splenic rupture is an uncommon complication of conservative management of splenic injury and is associated with a high mortality rate of 5-15% as compared to that of 1% in acute splenic injuries.⁵ Delayed rupture usually occurs 48 to 72 hours after initial trauma, but cases that present months after have also been reported.⁶ This patient presented 8 weeks after the primary event which was a minor low-velocity fall. Both clinical examination and initial investigations were inconclusive at the time of the first presentation.

A number of mechanisms have been described to explain the mechanism of delayed rupture. Clot dissolution, tear of subcapsular hematoma, rupture of pseudoaneurysm, and splenic pseudocyst are all possible mechanisms, which can cause delayed presentation of the injured spleen.⁷

A hemodynamically unstable patient with splenic injury presents with tachycardia and other signs of shock. Some signs such as Kehr's sign, left hemidiaphragm elevation, left-sided pleural effusion and basal atelectasis on the left side are strongly associated with splenic injury, but are not always reliable. A Bed-side FAST scan can help in ruling out an intraperitoneal injury while the patient is being resuscitated, but a CT scan is considered the gold standard to diagnose and grade the splenic injury in hemodynamically stable patients.

There is a debate on using serial CT scans in the follow-up of those patients who are managed non-operatively. Although the sensitivity of CT scan reaches upto 95% but the radiation exposure and cost-effectiveness limit the role of serial CT scans in this regard. Therefore, alternative methods should be applied to closely observe and monitor those who are at risk of complications. This patient on presentation at the emergency department immediately after trauma was hemodynamically stable and there were no abdominal signs. Serial FAST scans were done which showed no free fluid. The patient was discharged after 48 hours of observation.

Splenorrhaphy, angioembolisation, and splenectomy are the operative modalities that can be applied in the treatment of acute splenic injuries; on the other hand, delayed rupture of the spleen is nearly always managed by splenectomy. Lui *et al.* in their study found that the effect of operative and non-operative management of splenic ruptures was similar on the quality of life and those who underwent non-operative management had longer hospital stays.⁸ Therefore, splenectomy even in low-grade splenic injuries is a safer choice.

In conclusion, a high index of suspicion, close monitoring and careful observation and investigation, and timely management can go a long way in reducing morbidity and high mortality rates in delayed splenic rupture following minor trauma.

COMPETING INTEREST:

The authors declared no competing interest.

AUTHORS' CONTRIBUTION:

JZH: Introduction, case report, discussion.

MMHK: Abstract, discussion, proofreading.

FS: Literature search, introduction.

UM: Discussion, proofreading.

IK: Literature search, discussion.

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