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Delayed and Varied Complication of Non Operative Management in Adult Splenic Trauma

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Abstract : *Delayed splenic rupture following conservative management of splenic injury is an extremely rare complication. We report a case of an adult patient who presented with delayed splenic rupture along with unexplained hemothorax necessitating splenectomy, 45 days following blunt abdominal trauma that was initially managed conservatively and discharged home.*

Key words: *Abdominal trauma, Delayed splenic rupture, splenic injury, Splenic rupture, Hemothorax*

Introduction

Spleen is the commonly injured organ in blunt trauma abdomen. Most splenic injuries present immediately with clinical features of hypovolemia, tachycardia, hypotension, and hyperpnoea. With advancement in medical managements surgeons have become comfortable in managing traumatic spleens non-operatively. 15% of thus managed splenic trauma patients have the risk of delayed splenic rupture over a period of days to weeks⁽¹⁾. Delayed splenic rupture carries a higher rate of mortality up to 15% compared to 1% in case of acute splenic traumas⁽²⁾. In our institution conservative management of spleen is done for hemodynamically stable patients and patients responsive to the initial resuscitation with radiological splenic injury up to grade III and transfusion requirement varies from patient to patient. Here we present a 45 year old gentle man with progressively increasing abdominal pain and swelling. He also had significant left sided effusion which was unexplained due to no radiological evidence of rib fractures. The coexistence of left massive hemothorax along with a massive splenic hematoma in the absence of any radiologically and intraoperative evidence of diaphragm injury are coincidental rather than

casual. We feel that documenting these cases will help us in future in understanding the pathophysiology of delayed splenic rupture and its various clinical presentations.

Case presentation

45 year old male presented to casualty with the complaints of abdominal pain and swelling since 3 days. He also gave history of trauma 45 days back during which he was hit in the left side of back after which he developed abdominal pain and on further imaging was found to have splenic injury following which he was managed conservatively, during the course in hospital he was transfused 15 units of cross matched blood and was discharged after 7 days in stable condition. 15 days prior to admission he had similar abdominal pain which was relieved with pain medication. He had no history of fever or dyspnoea. On examination his blood pressure was 118/80 mmhg and pulse rate of 118bpm. The oxygen saturation in room air was 98% and respiratory rate was 18 per minute. He was alert conscious, oriented with Glasgow coma scale of 15/15. Chest examination showed equal expansion bilaterally and decreased air entry on the left side. Cardiovascular examination was

unremarkable. On examination, abdomen was soft and had non-tender, non pulsatile, solitary lump of size 20x18 cm over the left hypochondric and lumbar region. No external injuries were noted. Posteroanterior x-ray of chest revealed white out of left lung field and no rib fractures. ECG showed normal sinus rhythm and no evidence of ischemic changes. Ultrasound abdomen in the emergency department showed massive splenomegaly with multiple heterogeneous predominantly hypoechoic areas s/o splenomegaly with splenic hematoma and a left side pleural effusion of approx. 300cc.

Contrast enhanced computed tomography of abdomen and thorax showed a intraparenchymal laceration having a depth of 7cm involving lower pole with intraparenchymal and extraparenchymal hematoma with an approx. volume of 1700cc. Minimal fluid was noted in spleno renal space, left paracolic gutter and pelvis and massive left hemothorax approx. volume of 2000cc with underlying collapse of lower lobe.

In view of massive left hemothorax a suspicion of small rent in the diaphragm communicating with the splenic hematoma was thought off and was planned for an elective open splenectomy and a mini thoracotomy on the left side and evacuation of hemothorax by the cardiothoracic team. After three days of close observation, surgery was performed as planned. Pre-operatively, pneumococcal and H-Influenza vaccine prophylaxis was given. Intra operatively hemoperitoneum with clots were present a massive splenic expansile hematoma of size approx. 20x15 cm was noted. Clots were present in the Morrison's pouch and on evaluation no diaphragmatic rent was noted and approx. 2500ml of blood mixed with serous fluid present, no obvious lung parenchymal injury noted. Histological examination of the spleen showed features suggestive of traumatic injury. His postoperative period he developed leucocytosis and his antibiotics were stepped up. He received

regular heparin prophylaxis and was discharged on the 12th post op day in a satisfactory condition.

Discussion

Spleen being the most commonly injured organ in blunt injury to the abdomen can have varied presentations. Hemorrhage occurring as a result of parenchymal injury can be contained as sub capsular hematoma or hemoperitoneum, or as delayed rupture of splenic hematoma in shock. Delayed splenic rupture can occur any time following the initial trauma, 90% of delayed rupture occurs within the first four weeks⁽³⁾ and as late as 5 years have been documented⁽⁴⁾. Depending upon the severity and the duration of symptoms the presentation of delayed splenic rupture can be varied from upper left quadrant discomfort, radiating pain to the left shoulder or with signs of hypovolemic shock and carries a higher rate of mortality compared to acute splenic injuries. Recent history of decelerating motor vehicle accident, vomiting/retching, previous gastric bypass surgery have been reported to be contributing factors to the delayed rupture of spleen⁽⁵⁾. Underlying diseases like SLE, amyloidosis, sarcoidosis can be contributing factors for delayed rupture of spleen through pathologic changes within the spleen⁽⁶⁾

Our patient had an unusual presentation where he had complete white out of left lung field suggestive of left effusion but was asymptomatic for the same, in the absence of radiological evidence for rib fractures and lung parenchymal injury, which raised the doubt of a traumatic rent in the diaphragm during the trauma forming a communication with the splenic hematoma which has healed in due course. Spontaneous hemothorax due to fenestrations in the diaphragm have been documented in literature⁽⁷⁾. High index of clinical suspicion is required by a surgeon from patient's history and clinical examination in identifying a patient with delayed splenic rupture which can be complemented with additional

imaging like abdominal ultrasound and computed tomography, as delayed splenic rupture can mimic more common conditions like acute coronary syndrome, gastric ulcer, renal colic and abdominal aortic aneurysm. Conservative management of spleen is more feasible in this era with advanced monitoring, imaging modalities and easy availability of blood products. Conservative management of spleen can be considered in 1)hemodynamically stable patients 2)documentation of splenic injury by imaging 3)absence of associated intra-abdominal injury 4)no altered level of consciousness 5)age younger than 55 years of age⁽⁸⁾. Conservative management helps in preservation of immune status and in prevention of overwhelming post splenectomy sepsis. In our institution conservative management of spleen is done for hemodynamically stable patients and patients responsive to the initial resuscitation with radiological splenic injury up to grade III. Transfusion requirement varies from patient to patient as seen in our case he was transfused 15 units of blood prior to the present admission as he was conservatively managed for splenic trauma. Such massive transfusions for conservative management of spleen are debatable and the risks associated with such massive transfusions cannot be over looked. Ultra sound of abdomen serves as useful diagnostic and tool in the monitoring of patient with splenic hematoma. Periodical evaluation with ultrasound helps in monitoring subcapsular hematoma and its increase in size and help in early elective intervention. Computed tomography plays an important role in the evaluation and grading of splenic trauma other visceral injuries and retroperitoneal injuries. Computed tomography has a greater accuracy of 97% in the diagnosis of splenic trauma⁽⁹⁾. But due to the potential hazards of computed tomography it cannot be advised as blanket diagnostic protocol for evaluation of splenic trauma. In our case preoperative computed tomography of abdomen helped us identifying the grade of splenic injury as it was not known earlier and the magnitude of

massive splenic hematoma, but a definitive rent in the diaphragm to identify the cause of hemothorax could not be made out.

This case report once again highlights for splenic injuries effectively managed conservatively their delayed rupture and associated complications can still be a challenge to the surgeon owing to the high mortality, morbidity and financial constraints for patients especially in a country like India. Hence in conservatively managed splenic trauma surgeons should be aware of the continued risk and the patients have to be educated to look for early signs which can help in early presentation and better outcomes.

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