Spontaneous Splenic Rupture

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We present the case of a 27-year-old female who presented in hypovolemic shock due to splenic rupture without apparent cause. The patient underwent an open splenectomy followed by an uneventful recovery. Post-operatively the patient could recall no trauma, and exams for viral and neoplastic etiologies were unrevealing. Spontaneous splenic rupture is a rare condition requiring a high index of suspicion, and patients should be managed with prompt splenectomy. (*J Acute Care Surg* 2016;6:73-75)

Key Words: Spleen, Splenic rupture, Splenectomy, Rare diseases, Spontaneous rupture

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Introduction

We present the case of a healthy female who presented with hypotension and abdominal pain. She was found to have splenic rupture without apparent cause and underwent emergent splenectomy. A traumatic rupture of the spleen is a rare condition, as such clinicians should have a high index of suspicion in hypotensive patients with left upper quadrant pain, especially those with underlying diagnoses that could result in rupture. While there have been reports of non-operative management and organ preserving surgery, we recommend prompt splenectomy due to the high rates of mortality and conversion to splenectomy.

Case Report

A 27-year-old female without significant medical history presented to our emergency department with a three hour history of left upper quadrant abdominal pain which had awoken her

from sleep. This was associated with nausea and non-bloody, non-bilious emesis. On arrival her vitals showed a heart rate of 95, blood pressure of 79/65, respiratory rate 19 and an oxygen saturation of 99% on room air. Physical exam was notable for conjunctival and lingual pallor and generalized abdominal tenderness. Breath sounds were clear bilaterally. Her comprehensive blood count was notable for a leukocytosis to 28.5×10^9 cells/L with a left shift (71.9% neutrophils) and an anemia with hemoglobin of 8.3×10^9 cells/L. Basic metabolic panel was notable for an elevated glucose of 257 mg/dl, an elevated blood urea nitrogen of 22 mg/dl and hypokalemia of 3.2 mmol/L. Her labs were further notable for a lactic acidosis of 3.6 mmol/L.

A computed tomography (CT)-scan revealed free fluid and active extravasation from the spleen. She became increasingly tachycardic and hypotensive, precluding the possibility of embolizing the spleen angiographically. A left subclavian introducer sheath was placed and she was taken to the operating room for emergent exploration (Fig. 1).

Fig. 1. Pre-operative computed tomography demonstrating large hemoperitoneum and splenic defect.

A midline incision was made and the abdomen was entered. There was significant hemorrhage from a splenic defect which was controlled with manual compression. The splenic artery and vein were clamped with a hemostat and divided. The spleen was removed and the vascular structures were divided in block. The short gastrics were controlled with silk sutures with good hemostasis. The abdomen was then closed. At this point a pneumothorax was discovered on the pre-operative chest X-ray and a left sided chest tube was placed.

Post operatively the patient was taken to the intensive care unit. She was extubated on post-operative day one and, upon careful questioning, denied recent illnesses, procedures, trauma with the past month, or past medical history. Human immunodeficiency virus, hepatitis and Epstein-Barr virus serologies were non-reactive and her laboratory studies were unremarkable. Pathologic examination showed a non-enlarged spleen with a $1.5 \times 1.5 \times 0.9$ cm ruptured area. No malignancy or lymphoproliferative changes were identified. On post-operative day 6 her chest tube was removed and she was given *Streptococcus pneumoniae* and *Haemophilus influenza* vaccination. Unfortunately due to drug shortages she did not receive *Neisseria meningitidis* vaccination. She was discharged home in stable condition. At two week follow up the patient was doing well. Arrangements were made for her to obtain her meningococcal vaccine, however she has been lost to follow up. We continue to make attempts to contact her and she has not yet received the meningococcal vaccine.

Discussion

Atraumatic splenic rupture was first reported in 1861 by Rokitsansky [1,2] with idiopathic rupture first being described in

1874 by Atkinson [3,4]. It remains a rare condition with a recent review citing atraumatic rupture in 0.1~0.5% of all splenic ruptures [1]. A recent systematic review further described the causes as pathologic (93%) and idiopathic (7%). Pathologic causes were divided into 6 major etiologies- neoplastic disorders (16.4%), infectious cases (14.8%), non-infectious inflammatory disorders (10.9%) genetic disorders (1.7%), drug and treatment related effects (7.2%), and mechanical disorders (4.3%) [2]. Despite knowing the underlying cause, the exact mechanisms of atraumatic rupture are unknown. Possible mechanisms may include compression of the spleen, intrasplenic tension from cellular hyperplasia, reticular endothelial hyperplasia secondary to vascular occlusion [1].

In 1953, Orloff and Peskins described four criteria to diagnose idiopathic rupture including lack of perisplenic adhesions, grossly normal histology, lack of trauma and lack of associated pathology [1,3]. Our patient denied trauma within the past month. While our patient had a pneumothorax, this was not associated with rib fractures and was not present on CT prior to introducer sheath placement. As such it is believed that this finding was a complication of catheter placement rather than due to trauma. Therefore, our patient met all criteria and therefore represents true idiopathic rupture. It is possible patients with idiopathic rupture have an as yet undescribed pathology underlying their rupture with all pathologic evidence consumed in the injury [2]. Alternatively it is possible that this may represent delayed rupture from seemingly minor trauma suffered previously.

Though there have been reports of successful management of atraumatic splenic rupture with non-operative management or through organ preserving surgery [2,4] splenectomy remains standard of care, in part due the high mortality and failure rates of non-operative management. Renzulli et al. [2] note that delayed

splenectomy occurs in approximately 17% of patients undergoing conservative management, while another review cites a mortality of 93% with non-operative management. As Renzulli et al. [2] note, splenectomy has the advantage of potentially allowing for pathologic diagnosis. They also note that malignant etiologies may justify removal [2].

There have been reports of managing atraumatic splenic rupture with laparoscopic splenectomy [4], however due to the patient's profound hypotension and large hemoperitoneum, we elected to proceed with urgent laparotomy as it was felt that we would have inadequate visualization laparoscopically. Regardless of approach, the high mortality and high rates of conversion to operative management associated with conservative treatment require splenectomy, particularly in patients in shock.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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