Surgery On-Line 2005

Spontaneous Rupture of the Normal Spleen: A Case Report

Authors: Bobbak Vahid, MD#
Amy Bosanac, MD*
Paul Marik, MD#

Address for Correspondence:
Bobbak Vahid, MD
Thomas Jefferson University
1015 Chestnut Street, Suite M-100
Philadelphia, PA 19107
Tel: 215 955-6591
Fax: 215 955-0830
Bobbak.vahid@mail.tju.edu

Abstract

Splenic rupture is a well-described complication of blunt abdominal trauma. Splenic rupture without history of trauma also has been reported. Atraumatic splenic rupture is an uncommon and potentially fatal clinical entity. Immediate diagnosis and surgical treatment can be life saving. We present a case report of atraumatic splenic rupture with no abnormal findings on pathologic examination of spleen that was treated with splenectomy.

Case Report

A 50-year-old man presented to the emergency department with a complaint of subjective fever and abdominal pain for three days. The morning of presentation, the patient developed increased weakness, fatigue and diarrhea. He had no chest pain, shortness of breath, or diaphoresis. He complained of a cough productive of clear sputum.

The vital signs on presentation to the emergency department were notable for a blood pressure of 77/41 mmHg and a pulse of 78 /minute. His oxygen saturation was 92% on room air. His skin was cool and he had pale conjunctiva. His mucous membranes were dry. He had a left sided neck mass which was non-tender and located just lateral to the sternocleidomastoid muscle. Heart and lung exams were unremarkable. His abdomen was soft, distended and diffusely tender to palpation. There were normoactive bowels sounds. There was no rebound or guarding.

The patient briefly responded to fluid resuscitation with normal saline, but eventually required dopamine drip for blood pressure support. Initial laboratory findings include hemoglobin of 6.5 g/dl (baseline 9.4 g/dl), white blood cells 12.4 10^3/L with 86% neutrophils and 1% bands. After four units of packed red blood cells, the patient's hemoglobin went from 6.5 g/dl to 7.1 g/dl. He developed increased abdominal distension and nausea. On abdominal examination there were no flank ecchymoses, but voluntary guarding and decreased bowel sounds were noted. Computed Tomography scan (CT scan) of abdomen showed a large splenic hematoma and intraabdominal fluid (**Figure 1**).

In the operating room, the surgeons found a capsular tear in the spleen and intraabdominal blood. The liver, pancreas, small and large bowel appeared normal. There were no perisplenic adhesions. The splenic vasculature was unremarkable. A splenectomy was performed with an estimated blood loss of seven liters. On gross examination, the spleen size was 17.5 x 9.7 x 4.5 cm and weighed 436 grams. Microscopic examination showed expanded red pulp and moderate follicular hyperplasia, a nonspecific finding **(Figure 2)**. There was no morphologic evidence for malignancy. The patient was extubated on the first post operative day. He was discharged on the eighth post operative day. On repeated enquiries he denied any history of trauma.

Discussion

Clinicians are widely familiar with splenic rupture as a complication of blunt abdominal trauma. Although rare, rupture of the spleen without abdominal trauma also occurs. Rapid recognition of this potentially fatal condition is imperative so that the appropriate resuscitation and surgical intervention can be begun in a timely manner. Increased awareness by clinicians can lead to faster diagnosis and treatment.

The first reported cases of spontaneous splenic rupture were by Rokitansky in 1861(1) and Atkinson in 1874(2). Weidman in 1927 first used the term spontaneous splenic rupture to describe rupture of the spleen without apparent trauma following insignificant events, including muscular exertion (3). Knoblich in 1966 suggested that the term “spontaneous” be replaced by “pathologic” in atraumatic rupture of the diseased

spleen (3). Spontaneous rupture of apparently normal spleen has also been reported (1-4).

In review of reported cases of spontaneous rupture of the normal spleen in 1958, Orloff and Peskin found that only 28 of 71 cases have no other explanation for rupture (4). According to Orloff and Peskin, cases of spontaneous splenic rupture must fulfill the following criteria: 1. No history of trauma either prior to operation or retrospectively after operation, 2. No evidence of disease that can affect the spleen, 3. No evidence of perisplenic adhesions or scarring of the spleen, which suggests trauma or previous rupture, 4. The spleen should be normal on gross and histologic examination other than findings of hemorrhage and rupture (4). Splenic rupture secondary to subclinical viral infection may occur (5). Crate and Payne in 1991 added the fifth criteria, "Full virological studies of acute phase and convalescent sera should show no significant rise in viral antibody titers suggesting recent viral infection of types associated with splenic involvement."(6).

The etiology of spontaneous rupture of the normal spleen is not known. There are many different speculations regarding the cause of this rare clinical entity, but most of these theories lack strong evidence to support them. These theories include (2, 4):

1. Localized involvement of the spleen with a pathologic process, which upon rupture all evidence of pathologic changes are destroyed.
2. Reflex spasm of splenic vein causing acute splenic congestion.
3. Portal venous congestion with chronic splenic congestion.
4. Abnormally mobile spleen that undergoes recurrent torsions and the resultant congestion leads to rupture.

5. Rupture of a degenerative or aneurysmal splenic artery.
6. Forgotten or unnoticed trauma.
7. Sudden increase in abdominal pressure leads to rupture (i.e. A heavy meal, defecation, lifting, sexual intercourse).

Spontaneous rupture of the spleen has been reported as a complication of infectious, inflammatory, hematologic, neoplastic, and gastrointestinal disorders that are summarized in **Table 1** (3-5, 7-18).

Summary

In summary, primary spontaneous splenic rupture is a rare entity that needs a high index of suspicion for diagnosis. Abdominal CT scan is very helpful to detect this potentially fatal condition. Other inflammatory, neoplastic, and infectious causes of splenic rupture should be considered in differential diagnosis.

Figure 1. Abdominal CT scan. Notice splenic hematoma (arrow) and fluid around the liver (arrow head).

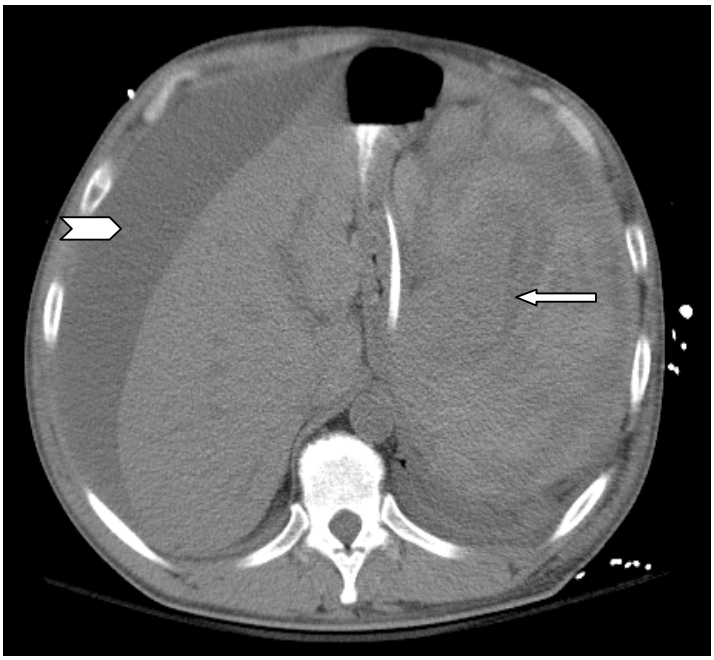

Figure 2. Histologic examination showed expanded red pulp and moderate follicular hyperplasia.

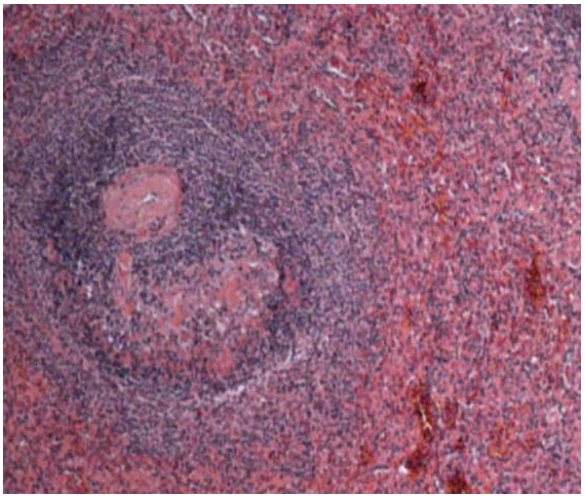

Table 1.Causes of Spontaneous Splenic Rupture

Infectious causes	Infectious mononucleosis Viral Hepatitis Subacute bacterial endocarditis Typhoid fever Relapsing fever Tuberculosis Tularemia Brucellosis Syphilis Malaria Kalazar
Hematologic and Neoplastic causes	Hemophilia Anticoagulation Hemolytic anemia Myeloid metaplasia/fibrosis Lymphoma and leukemia Multiple myeloma
Gastrointestinal causes	Crohn's disease Pancreatitis
Infiltrative causes	Amyloidosis Felty's syndrome Gaucher's disease Sarcoidosis Metastatic cancer

References

1. Laseter T. McReynolds T. Spontaneous splenic rupture. *Military Medicine. 169:673-4, 2004.*

2. Badenoch DF. Maurice HD. Gilmore OJ. Spontaneous rupture of a normal spleen. *Journal of the Royal College of Surgeons of Edinburgh. 30:326-7, 1985.*

3. Lieberman ME. Levitt MA. Spontaneous rupture of the spleen: a case report and literature review. *American Journal of Emergency Medicine. 7(1):28-31, 1989.*

4. Orloff, MJ. Peskin, GW. Spontaneous rupture of the normal spleen-a surgical enigma. *International Abstracts of Surgery. 106:1-11 1958.*

5. Hyun BH. Varga CF. Rubin RJ. Spontaneous and pathologic rupture of the spleen. *Archives of Surgery. 104:652-7, 1972.*

6. Crate ID. Payne MJ. Is the diagnosis of spontaneous rupture of a normal spleen valid?. *Journal of the Royal Army Medical Corps. 137:50-1, 1991.*

7. Arnold RE. Van Vooren A. Spontaneous rupture of the spleen with Hematoma. *Southern Medical Journal. 68:863-4, 1975l.*

8. Ford GA. Bradley JR. Appleton DS. Thiru S. Calne RY. Spontaneous splenic rupture in polyarteritis nodosa. *Postgraduate Medical Journal. 62:965-6, 1986.*

9. Andrews DF. Hernandez R. Grafton W. Williams DM. Pathologic rupture of the spleen in non-Hodgkin's lymphoma. *Archives of Internal Medicine. 140:119-20, 1980.*

10. Saba HI. Garcia W. Hartmann RC. Spontaneous rupture of the spleen: an unusual

presenting feature in Hodgkin's lymphoma. *Southern Medical Journal. 76:247-9, 1983.*

11. McCain M. Quinet R. Davis W. Serebro L. Zakem J. Nair P. Ishaq S. Splenic rupture as the presenting manifestation of vasculitis. *Seminars in Arthritis & Rheumatism. 31:311-6, 2002.*

12. Ahmed A, Eller PM, Schiffman FJ. Splenic rupture: an unusual complication of colonoscopy. *Am J Gastroenterol. 92: 1201-4, 1997.*

13. Zingman BS. Viner BL. Splenic complications in malaria: case report and review. *Clinical Infectious Diseases. 16:223-32, 1993.*

14. Blankenship, James C. Spontaneous Rupture Complicating anticoagulation or Thrombolytic Therapy. *American Journal of Medicine. 94: 433-437, 1993.*

15. Sharma OP. Splenic rupture in sarcoidosis. Report of an unusual case. *American Review of Respiratory Disease. 96:101-2, 1967.*

16. Van Landingham SB. Rawls DE. Roberts JW. Pathological rupture of the spleen associated with hepatitis A. *Archives of Surgery. 119:224-5, 1984.*

17. Brook, J. Newnam, PE. Spontaneous rupture of the spleen in hemophilia. *Archives of Internal Medicine. 115: 595-7, 1965.*

18. Ahmed A. Eller PM. Schiffman FJ. Splenic rupture: an unusual complication of colonoscopy. *American Journal of Gastroenterology. 92:1201-4, 1997.*

Published October 8th 2005