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# Splenic cyst during pregnancy

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ABSTRACT

*INTRODUCTION:* Splenic cyst during pregnancy is rare and may result in spontaneous rupture during the third trimester, which increases perinatal morality.
*PRESENTATION OF CASE:* We present a 27-year-old healthy Caucasian female who presented at 18 weeks gestation with left flank pain, early satiety and weight loss. Imaging studies demonstrated a large complex multiloculated splenic cyst. The patient underwent a successful laparoscopic splenectomy and delivered a healthy child at term without complication.
*DISCUSSION:* Spontaneous rupture of a splenic cyst during the third trimester incurs a perinatal mortality rate as high as 70%. Surgical management includes open or laparoscopic splenectomy or fenestration and preservation of the spleen.
*CONCLUSION:* Laparoscopic splenectomy during the second trimester appears to be safe and offers definitive management of a large symptomatic splenic cyst during pregnancy.


## 1. Introduction

The incidence of splenic cysts in the general population is low with only 800 cases reported worldwide.[1] Splenic cysts during pregnancy are even more rare with only 8 cases reported thus far.[2] Types of cysts documented include cystic spuria, hydatid, epithermoid and pseudocyst.[2–8] Cysts larger than 5 cm in diameter are more likely to be symptomatic and the most feared complication is spontaneous rupture.[1,9] Rupture results in hemoperitoneum, peritonitis, abscess or shock and is related with a perinatal mortality as high as 70%.[10]

## 2. Presentation of case

A 27-year-old Caucasian female presented at 18 weeks gestation with left sided flank discomfort, early satiety and weight loss. She underwent ultrasound imaging that detected a splenic cyst. This was further evaluated by magnetic resonance imaging (MRI), which demonstrated a complex, multiloculated cystic lesion, which measured 11 cm × 6.6 cm × 11.4 cm (Fig. 1a and b). The splenic vasculature was patent and there was no evidence of an aneurysm.

The patient had a prior miscarriage at 6 weeks gestation and her past medical history was significant for mononucleosis. She did not have a history of trauma, recent travel or illness. She did not have any prior abdominal surgery. She also denied family history of lymphoma. Laboratory studies included an IgG level that was within normal limits indicating that she did not harbor a parasitic (hydatid) cyst. Given the increased risk of rupture and fetal loss during the third trimester, we proceeded with a laparoscopic splenectomy. The patient was given meningococcal, pneumococcal and influenza vaccines 2 weeks preoperatively.

Given the patient's symptoms of pain and associated weight-loss as well as the possibility of cyst rupture or infection in the setting of pregnancy, intervention was recommended over conservative management. All treatment options including drainage, fenestration, marsupialization and partial vs. total splenectomy were considered preoperatively and discussed with the patient at great length. The risks and benefits of each intervention were compared with respect to likelihood of cyst recurrence, need for re-intervention, as well as potential complications and time to recovery. Splenic preservation could be accomplished with simple drainage, fenestration, marsupialization or partial splenectomy. However given the size of the cyst and its many loculations, which abutted the splenic vessels, pancreas, stomach and colon, it would have been technically challenging and may have lead to early recurrence, bleeding or infection as well as the need for further intervention. By performing a laparoscopic splenectomy, a single intervention could be performed relatively safely with the least likelihood for recurrence and with a shorter recovery time, when compared to an open operation.

A laparoscopic splenectomy was performed through 5 ports. The patient was placed in full right decubitus position and essentially lying on her right flank, in order to avoid compression of the inferior vena cava by the fetus. There were no hypotensive episodes experienced during surgery and the patient positioning provided excellent visualization of the spleen and associated vasculature.

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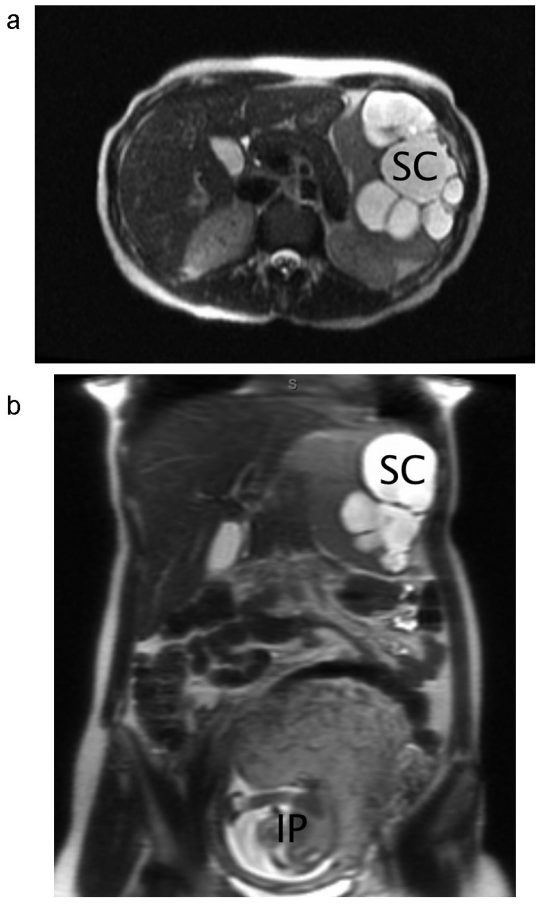


**Fig. 1.** (a) MRI (axial) of splenic cyst (SC). (b) MRI (coronal) of splenic cyst (SC) also demonstrating the intrauterine pregnancy (IP).

A large multiloculated splenic cyst was identified laparoscopically (Fig. 2). The operative technique involved initial exposure and dissection of the splenic vasculature, use of surgical staplers to divide the splenic artery and vein and finally, dissection of the spleen from the splenocolic and splenophrenic ligaments.

The operative time was 4 h and 30 min and blood loss was estimated at 300cc. The specimen was placed into a sterile laparoscopic bag and then morcellated within the bag, prior to removal through the umbilical port (Fig. 3). The patient was discharged on postoperative day 4. There were no postoperative complications and the patient delivered a healthy child at term. Final pathology demonstrated a benign epidermoid splenic cyst.

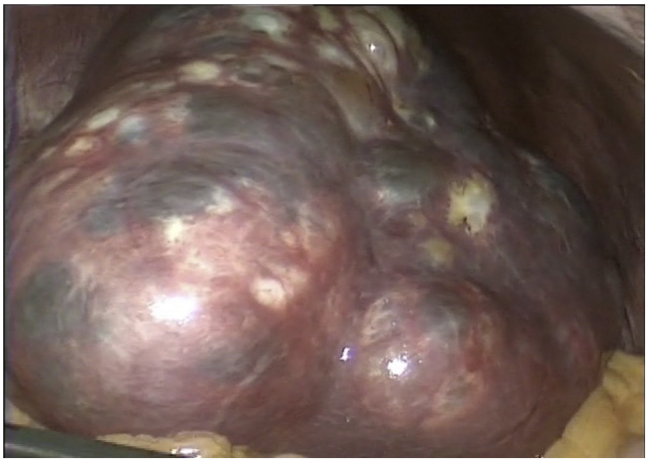

**Fig. 2.** Intraoperative image of splenic cyst during laparoscopy.

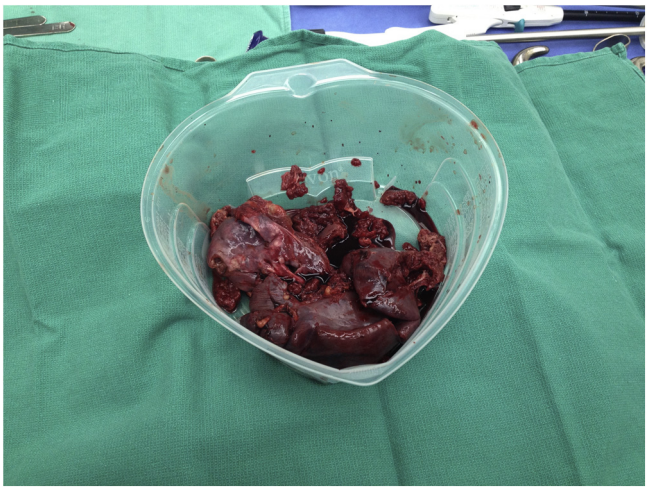

**Fig. 3.** Morcellated spleen after laparoscopic splenectomy.

## 3. Discussion

Primary splenic cysts are classified as parasitic, congenital or neoplastic, while secondary cysts (pseydocysts) are usually posttraumatic in origin. Primary splenic cysts represent 30–40% of cysts encountered and are more common among children and young adults.[11] Parasitic (hydatid) cysts are commonly caused by the parasite *Echinoccocus granulosus* and rupture of the cyst may result in anaphylactic shock.[12] Congenital cysts are further classified depending on their tissue of origin: epidermoid, dermoid or endodermoid. The epidermoid type accounts for 90% of primary nonparasitic cysts.[13] Neoplastic cysts may involve all three germ layers or cystic vascular lesions such as hemangiomas or lymphangiomas.[14] Although trauma accounts for the majority of secondary splenic cysts, other causes of secondary splenic infarction include sickle cell anemia and infections such as mononucleosis, tuberculosis or malaria.[8] Splenic infarcts may also occur as a result of hormonal changes during pregnancy.[14]

Although more than 70% of patients with splenic cysts are asymptomatic, symptoms may include pain, nausea, vomiting, early satiety or weight loss.[15] Large cysts may result in referred pain to the left shoulder and involvement of the left kidney may result in proteinuria or hypertension.[9,13] Finally, circulatory changes may result in thrombocytopenia, and anemia.

Both serological studies and imaging assist in making the diagnosis. Ultrasonography (US), computed tomography (CT) and magnetic resonance imaging (MRI) are useful as they are able to distinguish between cystic and solid masses of the spleen, identify key morphology of the cyst (i.e. unilocular vs multilocular) as well as the composition of the cystic fluid, presence of calcifications and vascular anatomy. Splenic cysts are typically depicted by signal intensity that equals water on both TI and T2 MRI images.[16] Since rupture of a hydatid cyst may result in anaphylactic shock, thus it is important to obtain a serum IgG antibodies to rule out a parasitic etiology before surgery. Epidermoid splenic cysts can be ruled out with a normal carbohydrate antigen 19-9 (CA 19-9) level.[13] Finally, percutaneous aspiration of a benign appearing cyst can help exclude the diagnosis of a neoplastic process, however there is a small risk of seeding the tract with malignant cells.[8]

Splenic cysts larger than 5 cm in diameter should be managed surgically as they are more likely to result in complications such as rupture or infection.[9,11,17,18] Treatment options include