



Postcoital cyst rupture presenting as peritonitis and hemorrhagic shock: A case report

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ABSTRACT

Introduction: This report presents an unusual case of severe post-coital abdominal pain and signs of hemorrhagic shock requiring admission to a surgical intensive care unit (SICU) and emergent laparoscopy. This case was unique given the timing and progression of the patient's symptoms, as well as her age, surgical history, and symptomatic progression. Here we document the notable characteristics and treatment of this patient.

Case presentation: The patient presented to a local emergency department with signs progressive peritonitis and shock after an episode of non-traumatic intercourse. Her initial computed tomography (CT) scan showed signs of free fluid in the abdomen around the bladder and liver with no definitive source of bleed. She developed worsening shock with severe pain. She was then emergently transferred to a tertiary care center for evaluation by gynecology service and for general trauma surgery evaluation. She was further stabilized in the emergency department, and then admitted to the surgical critical care service. Following additional imaging, she received exploratory surgery with gynecology to control a hemorrhagic ruptured cyst. She remained stable and was discharged the next day.

Conclusion: This case demonstrated a complication of an often-benign diagnosis, revealing the potential danger of underestimating this chief complaint, as well as the importance of understanding how minimal trauma can lead to cyst rupture.

1. Introduction

Ovarian cysts are common sources of abdominal pain and discomfort in the emergency department. Patients rarely present with symptoms of severe abdominal pain consistent with peritonitis, and even fewer presenting with hypotension and shock. Here, we present a case of a 38-year-old woman with post-coital peritonitis complicated by hemoperitoneum and hypotension.

2. Case Presentation

A 38-year-old woman presented to the emergency department (ED) as a stable transfer from a local emergency department for severe abdominal pain and concerns for hemoperitoneum on preliminary abdominal computed tomography (CT) imaging. Her history included three pregnancies, with two preterm vaginal births and one molar

pregnancy that resulted in a total abdominal hysterectomy without oophorectomy and a subsequent tubal ligation. Transfer was initiated for surgical evaluation, given signs of abdominal bleeding and shock.

The patient initially presented with sudden-onset severe right lower-quadrant pain that began at 7:30 in the morning. She denied preceding symptoms or injury prior to the day of presentation. The pain occurred approximately 30 min following consensual, non-vigorous, non-painful intercourse with her husband. She denied any trauma or vaginal bleeding before, during, or immediately after intercourse. She denied the use of any penetrative vaginal or rectal devices. On review of systems, she denied any nausea or vomiting, fever, or chills. She also reported no family history of bleeding disorders or abnormal menstrual pain or bleeding. Of note, she did report history of chronic, frequent nonsteroidal anti-inflammatory use of ibuprofen at a dose of 800–1000 mg for treatment of pain related to a traumatic orthopedic injury three months prior to presentation.

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At the local ED, presenting vital signs were unremarkable but laboratory results were notable for a hemoglobin level of 14 g/dL (reference range 12.0 to 16.0 g/dL). Labs included a negative urine pregnancy test. Contrast-enhanced abdominal and pelvic CT was ordered due to the patient's severe abdominal pain, which showed a complex fluid collection adjacent to the spleen and anterior liver, tracking into the paracolic gutters and pelvis. Preliminary radiology reports indicated free fluid consistent with blood [Fig. 1]. The liver showed a low-density lesion within the right hepatic lobe measuring up to 1.9 cm. Repeat labs demonstrated a hemoglobin drop to 11 g/dL, which coincided with progressive hypotension with systolic blood pressure less than 75 mmHg. Resuscitative measures included three liters of crystalloid fluid and two units of packed red blood cells. The patient was then transferred to an academic tertiary care facility for management of hemorrhagic shock requiring possible surgical intervention.

On arrival at the tertiary care facility, the patient reported worsening abdominal pain despite previous administration of opioid analgesics. Vitals were notable for a reported blood pressure of 106/71 mmHg, with heart rate at 72 bpm. Given the patient's presentation and symptoms, as well as information from the local hospital, the initial differentials included ruptured ovarian cyst, traumatic dehiscence of the vaginal cuff, ruptured hepatic adenoma, and bleeding pelvic aneurysm. However, large-vessel injury, non-accidental trauma, or a severe coagulopathy were also considered.

Physical exam was remarkable for diffuse tenderness to palpation, worse in bilateral lower quadrants and suprapubic region with guarding. Bedside point-of-care ultrasound demonstrated free fluid in the anterior Morrison's pouch, peri-splenic free fluid, and trace fluid in the anterior pelvis. Pelvic exam did not demonstrate any trauma, frank bleeding, or dehiscence of the patient's vaginal cuff.

Labs showed hemoglobin of 11.5 g/dL, negative pregnancy test, and mild elevation in prothrombin time of 15 s (normal range 9.4 to 12.15 s). Given the presentation of peritonitis and shock, the patient was also given one gram of tranexamic acid in accordance with post-partum hemorrhage dosing. A thromboelastographic (TEG) was drawn to determine any need for reversal of ongoing coagulopathy. The patient remained stable throughout her ED stay, with stable vital signs, no significant drop in hemoglobin or hematocrit or signs of worsening shock. Due to the severity of her pain, as well as initial hypotension and likely ongoing bleed, the acute care surgery team determined admission to SICU would be necessary for close monitoring while awaiting further imaging and identification of the patient's active source of bleeding.

During the patient's SICU admission, a contrast-enhanced abdominal magnetic resonance imaging (MRI) study was completed to identify the source of symptoms and hemoperitoneum [Fig. 2]. It demonstrated a 3.1 by 2.5 cm cystic structure within the right ovary. The radiology preliminary image interpretation indicated the mass was most likely a

ruptured hemorrhagic cyst. The MRI also demonstrated active extravasation of contrast material with an associated large volume of pooled blood within the pelvis, likely indicating continued bleeding. Celiac artery stenosis was also seen, which was thought to be related to median arcuate ligament syndrome rather than traumatic injury. This was thought to be a possible incidental finding and was not indicated on the initial preliminary read. Lastly, a non-bleeding hepatic lobe hemangioma was redemonstrated [Fig. 2], which could also have been a source of bleeding.

The patient's TEG demonstrated only minimal signs of coagulopathy, with clot formation time (R time) at 4.7 min (normal at five to ten minutes), the time it took for clot to reach fixed stability (K time) at one minute (normal at one to three minutes), the speed of fibrin accumulation measurement (Alpha angle) at 69.7 degrees (normal at 53–72 degrees), maximum amplitude demonstrating platelet function (MA) at 65.6 mm (normal at 50–70 mm), and demonstration of effective fibrinolysis (ly30) at 0.8% (normal at 0–8%). Due to these grossly normal findings, reversal of anticoagulation was withheld.

Overnight in the SICU, the patient's hemoglobin dropped from 11.3 g/dL to 9.4 g/dL and was accompanied by worsening pain. The patient was subsequently taken to the operating room by gynecology for emergent diagnostic laparoscopy and treatment and ablation of any identified ongoing hemorrhage. Operative documentation indicated the patient maintained mean arterial pressure readings above 65 mmHg throughout the operation, with only 600 mL of crystalloid administered. Surgical findings demonstrated a right hemorrhagic cyst with scant bleeding as well as significant blood in the pelvis. The cyst was cauterized until hemostasis was achieved. Estimated blood loss was reported at approximately 1300 mL throughout the procedure. Additional histopathologic findings were not initially reported.

The patient tolerated the procedure well, with no further signs or symptoms of peritonitis or shock post-operatively. She was discharged to home the same day as her operation with a stable hemoglobin of 10.1 g/dL and pain well controlled.

Following her successful discharge, the patient remained well and was followed up roughly two weeks post-operatively, when she endorsed symptoms of continued fatigue and reported anemia, which was confirmed by laboratory analysis. She did not, though, require any blood or crystalloid transfusions, nor opioid medication post-operatively and reported near resolution of painful symptoms. No additional plans for further imaging or surgical intervention were planned.

3. Discussion

Ovarian cysts are common sources of abdominal pain and discomfort in the emergency department.[1,6,8,9,11] Physiologically, most develop from a functional corpus luteum cyst from a developing ovarian

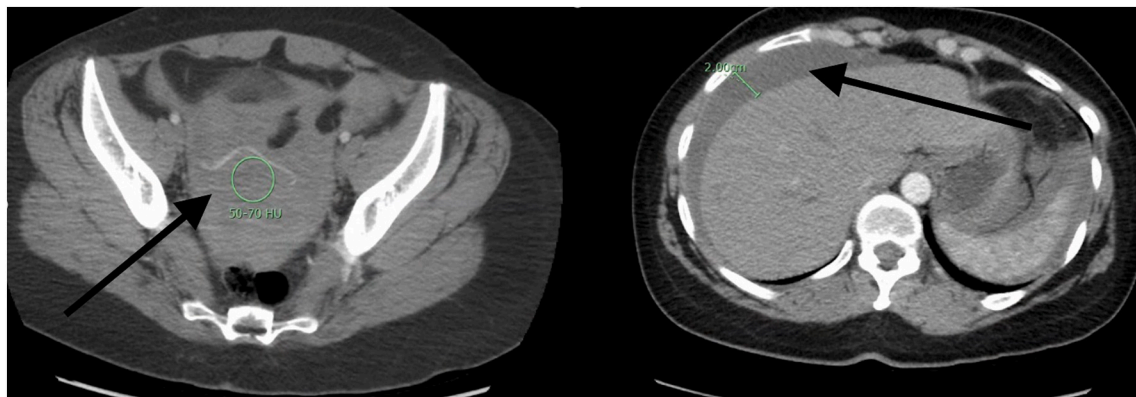


Fig. 1. Computed tomography (CT) demonstrating hemoperitoneum. The first arrow indicates suprapubic free fluid and the arrow on the right points to peri-hepatic free fluid.

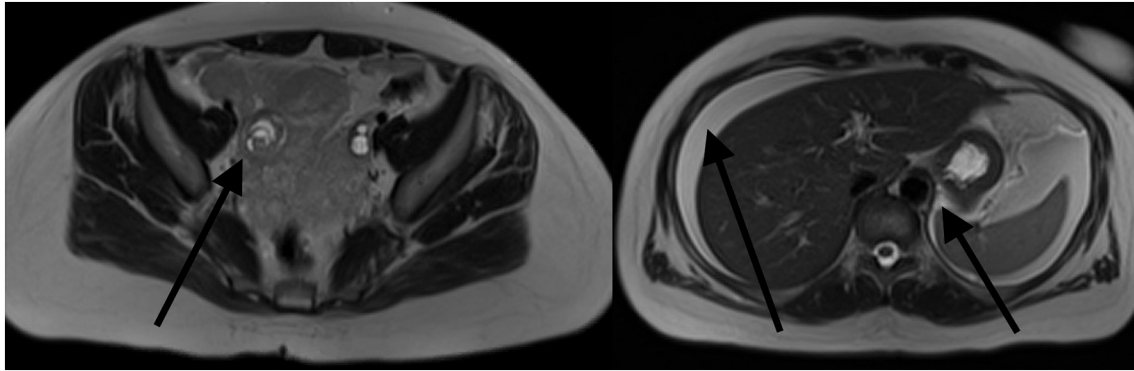


Fig. 2. Magnetic resonance imaging demonstrating a complex fluid collection around the liver and spleen. The arrow on the left indicates the site of the likely hemorrhagic cyst. The first arrow on the left points to free fluid around the liver with the second pointing to free fluid around the patient's kidney and spleen.

follicle during normal menstruation. Occasionally, a cyst may not appropriately involute, leading to enlarged cyst growth. As most cysts are thin walled and have multiple vascular sources, ovarian cysts can often lead to intraabdominal hemorrhage. Most cysts are roughly one to two cm in diameter and rarely cause any significant symptoms. Previous research has indicated that symptoms of hemorrhagic cysts often directly correlate with their size. They are most often seen in premenopausal women under the age of 30, with multiparous individuals demonstrating overall higher risk of rupture [4]. Studies indicate that ruptured ovarian cyst is the causative factor in 86% of cases of non-traumatic hemoperitoneum in women under the age of 35 [5,8].

The mechanism of post-coital ovarian cyst rupture has been speculated, but not well defined or confirmed. Hypotheses include rupture due to direct trauma from vaginal intercourse or vigorous penetration, or due to rapid acceleration/deceleration forces that may occur during vaginal penetrative sex [3]. As this patient did not report vigorous intercourse or demonstrate physical exam findings consistent with external trauma, the cause of her cystic rupture is uncertain.

The overall incidence of post-coital ovarian cyst rupture is unknown. While multiple case reports have been published, case series or clinical trends have not been well documented. We believe this case is unique, given the presentation age greater than 40 [2,7], as well as the patient's surgical history of hysterectomy. The reported size of the cyst is also uncharacteristically small for the severity of the patient's symptoms. Few case reports have documented significant exsanguination necessitating multiple transfusions and exploratory laparoscopy.

Transvaginal ultrasound is typically first line for diagnostic imaging, as CT has been demonstrated to have lower specificity in ovarian pathology. Given the patient's undifferentiated shock, the physician at the local hospital, in conjunction with the academic surgical team, opted instead for CT and MRI. Reports of bleeding cysts have been noted even with negative CT and negative laparoscopic evaluation [3]. Reliance on CT and MRI may have led to a delay in proper diagnosis; however, it is unlikely that this delay affected the overall outcome.

Hemorrhagic cysts may often require immediate resuscitation based on their initial presenting signs and symptoms, with a wide range of differential diagnoses if hypotension is present [10]. If stable, conservative measures are often utilized with frequent abdominal exams and lab trends being key to determine surgical necessity. Coagulopathy and blood loss should be reversed on an emergent basis. The patient did not require any reversal of anticoagulation, and while a TEG was utilized to identify coagulopathy, it is noted that its accuracy has not been demonstrated in ovarian cysts. Further management of a ruptured ovarian cyst often begins with conservative measures and can be escalated depending on clinical suspicion. If there are signs of heavy or ongoing blood loss, patients should be observed in the hospital for hemodynamic instability and changes in hemoglobin and hematocrit. Surgical intervention is not typically required for management of a

ruptured cyst. However, if admission and emergent consultation are determined to be unnecessary, it is still strongly advised to have patients follow up appropriately with a gynecologist on an outpatient basis.

4. Conclusion

Post-coital pain and bleeding is not an uncommon chief complaint in the emergency department. It is important to keep a wide differential in cases of peritonitis and shock in ED patients. However, as this case demonstrates, ruptured ovarian cyst should always be considered in those presenting with abdominal pain following vaginal intercourse, with appropriate resuscitation and transfer as needed to tertiary medical centers.

Contributors

Travis P Martin coordinated all information gathering, patient contact, literature review, and compilation of the manuscript.

Amanda Chung assisted in preliminary case report development and manuscript authorship.

Mary Knotts assisted in gathering information regarding the patient's outcome in ICU care.

Timothy Panknin assisted in formatting pictures and figures.

Philipp Hannan was faculty mentor and reviewer.

All authors contributed to patient care.

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Patient consent

Obtained.

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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