

## Case: Syncopal Episode

A 36-year-old G2P2 female with no past medical history presents to the ED following a syncopal episode. She reports having abdominal pain, feeling lightheaded, and then passing out. A witness to the episode denies that the patient had seizure activity. In the ED, the patient reports a mild headache, right-sided flank pain, and diffuse abdominal pain. Her vital signs are stable and she is afebrile. On physical exam she has right-sided suprapubic tenderness. There is no CVA tenderness. Which of the following is the most appropriate initial imaging study for this patient's condition?

- A. CT Abdomen/Pelvis with contrast**
- B. CT Abdomen/Pelvis without contrast**
- C. Pelvic Ultrasound**
- D. Upright Chest X-ray**
- E. Brain MRI**

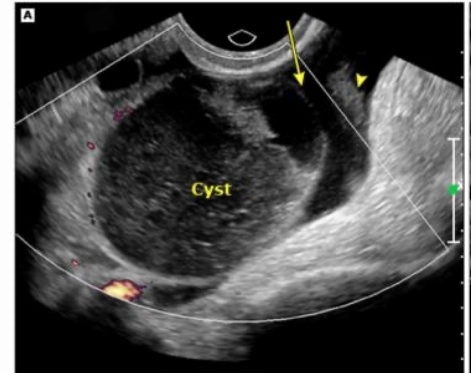


Figure 1. TVUS with power Doppler of ovary shows a hemorrhagic ovarian cyst. Cyst rupture indicated by break in ovary wall (arrow) and fluid and debris (arrowhead) next to the cyst.[1] Copyright 2022 by UpToDate®.



Figure 2. Hemoperitoneum Due to Ovarian Cyst Rupture.  
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## Discussion

The correct answer is **C. Pelvic Ultrasound**

Ruptured ovarian cyst is a well-known cause of unilateral pelvic pain in reproductive age females. This condition may have a range of presentations from mild pelvic pain to severe pain with syncope and hemodynamic instability. It is difficult to estimate incidence of ruptured ovarian cysts as presentation may be asymptomatic, mild, or quickly resolve preventing the patient from seeking further evaluation.

The presence of ovarian cysts in reproductive age women is normal and due to follicular rupture during the menstrual cycle. These physiologic cysts are typically less than 3 centimeters and can be filled with either serous fluid or blood. Physiologic ovarian cysts usually self-resolve however, if the cyst continues to collect blood or fluid, it can persist, enlarge, and become symptomatic. Larger cysts are more likely to rupture causing patients to present to the emergency department. Risk factors for ovarian cyst rupture include ovulation induction, history of ovarian cysts, vaginal intercourse, and anticoagulation. Interestingly, cysts are more likely to be present on the right ovary; a study by Abduljabbar concluded that of 244 ovarian cysts, 63% were right-sided [2].

A ruptured ovarian cyst may present with transient, intense unilateral pelvic pain that is typically sharp and focal. It is not uncommon to present following strenuous physical activity. In the cases of significant hemorrhage from a ruptured cyst, the pain may be diffuse and can present as flank pain, upper quadrant abdominal pain, pain with deep inspiration, or radiation to the shoulders.

Because of the wide differential for abdominal pain, investigation to rule out nephrolithiasis, ectopic pregnancy, ovarian torsion, and appendicitis may be warranted in patients with ovarian cyst rupture.

## Diagnosis & Treatment

Imaging of the pelvis is the mainstay of diagnosis in patients with suspected ovarian rupture. Pelvic ultrasound is the initial preferred method to evaluate the ovaries. Ultrasound has proven to be very effective in identifying hemorrhagic cysts with high likelihood ratios for cysts with certain characteristics [3]. Diagnostic characteristics include fibrin strands or a retracting clot and 90% of hemorrhagic ovarian cysts will have at least 1 of the 2 features [3]. For example, an ultrasound finding of an ovarian mass with fibrin strands, no septations and a smooth wall has a likelihood ratio of 200 for being identified as a hemorrhagic ovarian cyst [3].

Pelvic ultrasound is preferable, however, a contrast-enhanced CT of the abdomen and pelvis may be necessary to evaluate significant hemoperitoneum. In the case presented above, the patient had intra-abdominal fluid surrounding the proximal portion of the liver, both pericolic gutters, and hepatorenal recess or Morison's pouch. Initial ultrasound findings can mimic a ruptured ectopic pregnancy therefore a beta-hCG level should always be assessed [4].

## Diagnosis & Treatment (cont.)

Unstable patients require resuscitation and surgery. If concerned for blood loss, stable patients may be admitted for observation; ongoing blood loss usually requires surgical intervention. Large volume blood loss is characterized by large hemoperitoneum or a 10-point decrease in hematocrit [1].

If patient is stable and there is possible infection, the patient should be worked up for causes of infection like appendicitis or tuboovarian abscess. Malignancy should also be considered and ruled out. In the case of uncomplicated cyst rupture, patient may be observed then discharged for outpatient care.

In this patient presentation, blood pressure was 106/70 and laboratory evaluation detected a drop in her hemoglobin from 10.2 (Hct 30.5) to 8.8 (Hct 26.2). Following the management algorithm, this patient was admitted for observation.

## Take Home Points

- **The presentation of a ruptured ovarian cyst can be uncomplicated (asymptomatic, mild-severe transient sharp pelvic pain) or complicated (hemodynamic instability, ongoing blood loss, diffuse abdominal pain, pleuritic pain with inspiration).**
- **Ovarian cysts are easily visualized with pelvic ultrasound.**

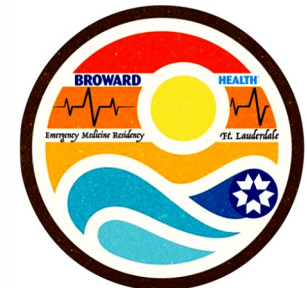


### About the Author

This month's case was written by Amanda Kahn. Amanda is a 4th year medical student from FIU-HWCOM. She did her emergency medicine rotation at BHMC in June 2022. Amanda plans on pursuing a career in Emergency Medicine after graduation.

### References

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