

## CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

A 20 year old woman presents with two days of increasing pelvic pain, with no dysuria, diarrhea, or constipation. On physical examination, the right adnexa is full and tender to palpation; there is no cervical motion tenderness or abnormal vaginal discharge. Serum pregnancy test is negative and WBC count is normal.

Which is the imaging examination of choice for the initial evaluation of female pelvic pain?

- (a) pelvic computed tomography (CT)
- (b) pelvic magnetic resonance imaging (MRI)
- (c) pelvic plain film examination
- (d) pelvic ultrasound (US)

<b>RADIOLOGY QUIZ QUESTION, ANSWER, AND EXPLANATION</b>
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Which is the imaging examination of choice for the initial evaluation of female pelvic?

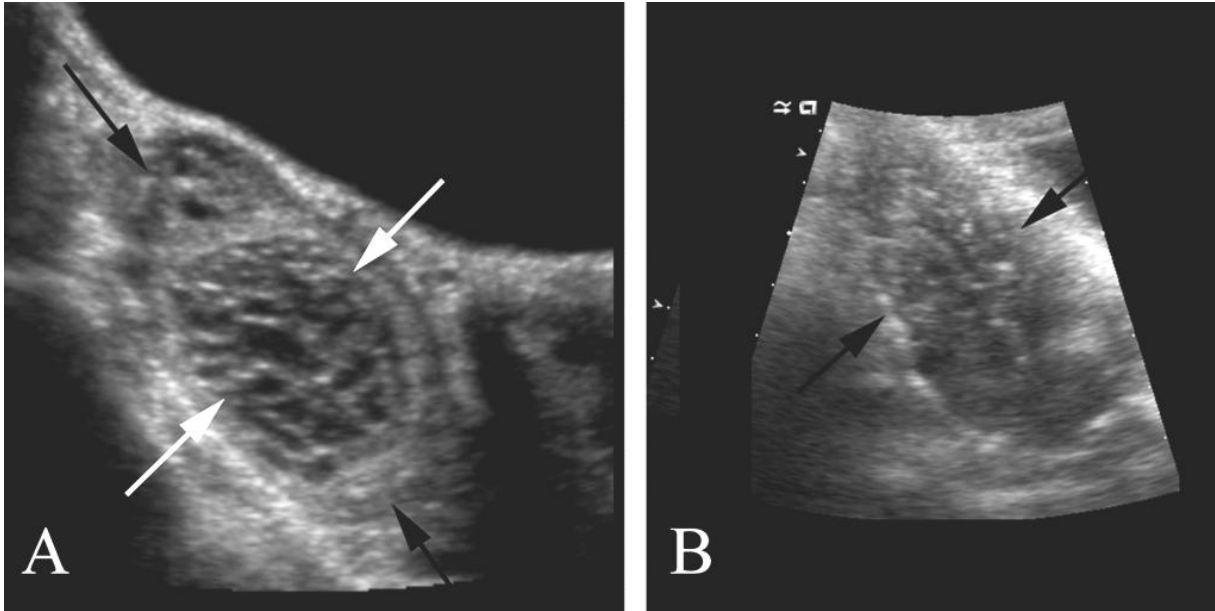
- (a) computed tomography (CT)
- (b) magnetic resonance imaging (MRI)
- (c) pelvic plain film examination
- (d) ultrasound (US)

Answer: (d), ultrasound. Pelvic ultrasound (US) is the imaging examination of choice for the evaluation of female pelvic pain.

Pelvic computed tomography (CT) may be used in evaluation of some female patients with pelvic pain, particularly when the pelvic ultrasound is not conclusive, but is not the initial imaging study of choice, and (a) is incorrect. Pelvic magnetic resonance imaging may be used in some cases for further evaluation of known pelvic masses (for example, for evaluation of endometriomas) and in evaluation of fertility problems, but it is also not the initial study of choice for the evaluation of pelvic pain, and (b) is also incorrect. Pelvic plain film examination may be used in some instances to document calcification in a fibroid or to evaluate for a possible fracture following trauma, but is not the imaging examination of choice for evaluation of nontraumatic pelvic pain, and therefore (c) is also incorrect.

## IMAGING STUDY AND QUESTIONS

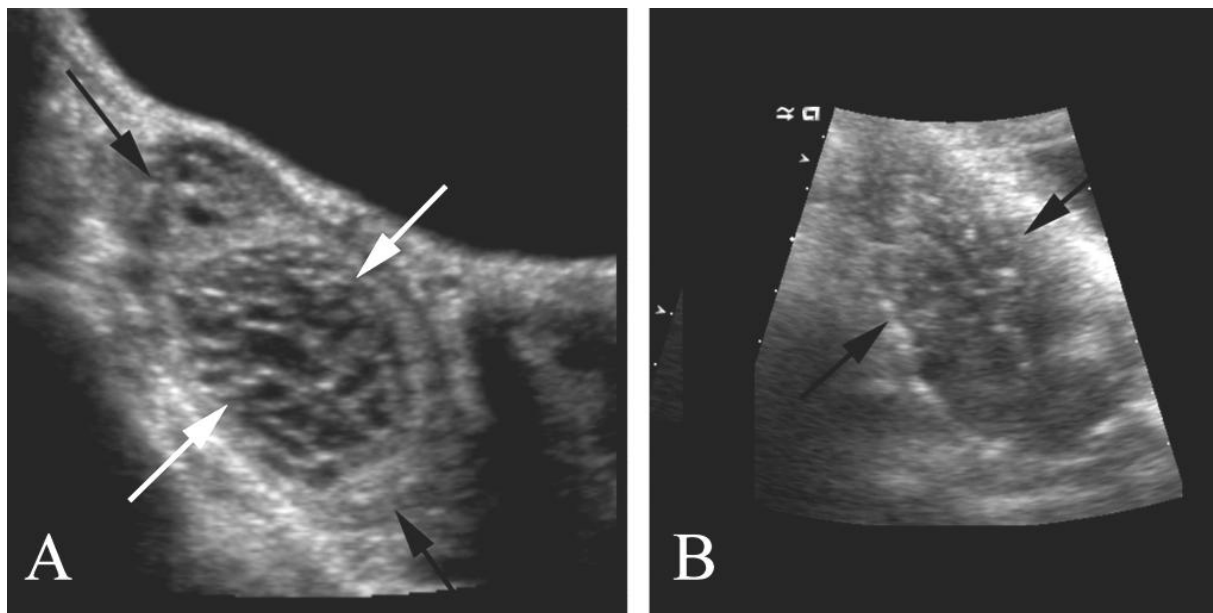
An imaging study was performed.



Imaging questions:

- 1) What type of study is this?
- 2) What is depicted by the black arrows in A?
- 3) What is depicted by the white arrows in A?
- 4) What is the differential diagnosis for this abnormal imaging finding?
- 5) What is the next step in patient management?
- 6) Image B was obtained five months later. What is depicted by the black arrows in B? How does this influence the answer to question 4?

## IMAGING STUDY QUESTIONS AND ANSWERS



Imaging questions:

- 1) What type of study is this? Pelvic ultrasound.
- 2) What is depicted by the black arrows in A? The right ovary.
- 3) What is depicted by the white arrows in A? A lesion within the right ovary.
- 4) What is the differential diagnosis for this abnormal imaging finding? Almost certainly a hemorrhagic ovarian cyst, with endometrioma of the ovary and benign or malignant complex primary ovarian neoplasm significantly less likely.
- 5) What is the next step in patient management? Given the overwhelming likelihood of hemorrhagic ovarian cyst, symptomatic treatment and a follow-up scan to document return to normal is reasonable.
- 6) Image B was obtained five months later. What is depicted by the black arrows in B? The right ovary, which is now normal in appearance. How does this influence the answer to question 4? This appearance supports the diagnosis of a hemorrhagic cyst of the ovary, and typically no further imaging or treatment is necessary.

<b>PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP</b>
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A presumptive diagnosis of hemorrhagic ovarian cyst was made at the time of the initial pelvic ultrasound, and the patient was treated with pain medication. Her symptoms gradually resolved, and she was pain free (and symptom free) at the time of the follow-up study.

## SUMMARY

**Presenting symptom:** Pelvic pain in a female patient of child-bearing years should be evaluated on an emergent basis given the dire consequences of ruptured ectopic pregnancy. This patient's pregnancy test was negative, essentially excluding this diagnosis. Other causes of pelvic pain include a physiologic ovarian cyst, a ruptured ovarian cyst, a hemorrhagic ovarian cyst, endometriosis, ovarian torsion, and pelvic inflammatory disease.

**Imaging work-up:** Following the physical exam, pregnancy test, and blood work, such patients will usually require a pelvic ultrasound for further evaluation. It is imperative for the interpreting radiologist to know the patient's pregnancy status so that the correct interpretation of the study can be offered. Pelvic ultrasound is highly accurate in many of the causative findings in women with pelvic pain, such as an empty gestational sac (with or without extrauterine abnormalities) in ectopic pregnancy, simple and hemorrhagic ovarian cysts, ovarian torsion, and endometriomas.

**Establishing the diagnosis:** The diagnosis of hemorrhagic ovarian cyst is typically made on the basis of classic ultrasound features such as were seen in this case. Classic findings include a "fish-net" or reticulated appearance of a lesion contained in the ovary, along with the classic history of unilateral adnexal pain with a negative pregnancy test and no features of pelvic inflammatory disease. The diagnosis is supported by return of the ovary to a normal appearance on follow-up ultrasound studies.

**Treatment:** Treatment for hemorrhagic ovarian cyst is typically symptomatic, with a follow-up study to secure the diagnosis by showing a return to a normal appearance.

**Take-home message:** Ultrasound is the imaging study of choice for evaluation of female pelvic pain.

## FURTHER READING

Droz JLB, Howard F. Evaluation of acute pelvic pain. UpToDate, accessed 12/26/08.

Renfrew, DL. Female Pelvis and Male Scrotum. Chapter 2 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at [www.symptombasedradiology.com](http://www.symptombasedradiology.com).