



A Pregnant Woman with Upper Right Quadrant Pain

Urgent message: When a pregnant patient presents to urgent care with right upper quadrant pain, initial bedside ultrasound screening for gallbladder disease can facilitate interventions and expedite follow-up care.

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History

A 25-year-old nulliparous female 24 weeks pregnant presented 4 hours after onset of nausea, vomiting, and right upper quadrant pain. She was feeling weak with an acid taste in her mouth. She reported being in good health and having an unremarkable pregnancy, with routine prenatal care. She had a normal fetal anatomy ultrasound at 23 weeks gestation. No trigger food, travel, or substance exposure was identified. Family history was negative for biliary disease.

Physical Examination

Her face was ashen, she was lying on the cart clasping an emesis bag. Mucus membranes were dry. Heart rate was regular and without excess heart tones. Lungs were clear to auscultation.

Abdomen was gravid 24 cm above the umbilicus. There was no abdominal rigidity, guarding or rebound tenderness; she had no McBurney's point tenderness although her Murphy's sign was positive.

Point-of-Care Ultrasound

Bedside ultrasound showed good fetal movement and a measured heart rate of 154. Laying the patient in the left decubitus position simplified locating her gallbladder; brief sweeps in both long and short axis revealed a single

Temperature	97.4° F
Heart rate	76
Blood pressure	108/69
Respiratory rate	18
Pulse oximetry	100%



large hyperechoic structure near the gallbladder neck with an accompanying posterior shadow. There was no pericholecystic fluid. The anterior wall of her gallbladder measured <3 mm, sonographic Murphy's equivocal and the common bile duct (CBD) was not visualized. These findings were consistent with cholelithiasis.

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Table 1. Differential Diagnoses

Differential Diagnosis	Classic Presentation
Acute fatty liver of pregnancy	Third trimester anorexia, headache, malaise, nausea, nonspecific abdominal pain, vomiting; progressive to jaundice, ascites, DIC, hypoglycemia and encephalopathy
Appendicitis	Diffuse periumbilical pain localizes to RLQ (though atypical RUQ pain may be seen in later gestation); anorexia, fever, nausea, vomiting. Exam findings: McBurney's/psoas/obturator/Rovsing signs; rebound and guarding
Ascending cholangitis	Jaundice, fever, RUQ pain (Charcot's triad); altered mentation and hypotension (Reynold's pentad)
Biliary colic	Intermittent nausea and vomiting, dull RUQ pain; provoked by fatty food
Bowel obstruction	Gradual onset of nausea, vomiting, cramping and obstipation. History of abdominal surgeries, malignancy, inflammatory bowel disease. Exam findings: abdominal distention
HELLP Syndrome (hemolysis, elevated liver enzymes, low platelets)	Variable presentation, though after 20 weeks gestation: colicky abdominal pain, nausea, vomiting, malaise; evidence of hypertension such as altered mentation, headache, vision changes
Myocardial Infarction	Varying symptoms, can include chest pressure, diaphoresis, dyspnea, dyspepsia, nausea, emesis
Pancreatitis	Acute onset of epigastric pain, nausea, or vomiting; exam findings of fever, hypotension, hypoxemia, tachypnea, tender epigastrium
Preeclampsia	Variable; headache, abdominal pain, peripheral edema, hyperreflexia/ankle clonus, visual changes, seizures (end stage); exam findings of elevated blood pressure after 20 weeks' gestation
Preterm labor	Menstrual-like cramping, contractions, low back ache, pressure in pelvis/vagina, spotting
Uterine rupture	Sudden onset of abdominal pain; exam findings of signs of shock with hypotension, uterine tenderness, non-reassuring fetal heart tones

Follow-up

The patient was transferred to the emergency department where she had labs including liver function testing and lipase which came back normal. Formal ultrasound confirmed cholelithiasis without cholecystitis. She received IV fluids and antiemetics and felt much better.

Per consultation with OB and general surgery, outpatient follow-up was advised. Cholecystectomy was postponed until 2 months postpartum. She had a successful vaginal delivery at 40 weeks 1 day gestation. Shortly after her cholecystectomy she returned to tolerating her normal diet.

Discussion

Gallbladder disease occurs in 20 million individuals in the United States, and is common in gravid women. The most common gallbladder disease in pregnancy is cholelithiasis, occurring in up to 3% of pregnancies. Risk factors include female sex, increased age, obesity, high serum lipid levels, as well as genetic predisposition.^{1,2} Women are at an increased risk during pregnancy due to the effects of progesterone and estrogen on the body.

Estrogen increases cholesterol secretion while progesterone reduces soluble bile acid secretion which leads to an increase in gallstone formation. Progesterone also

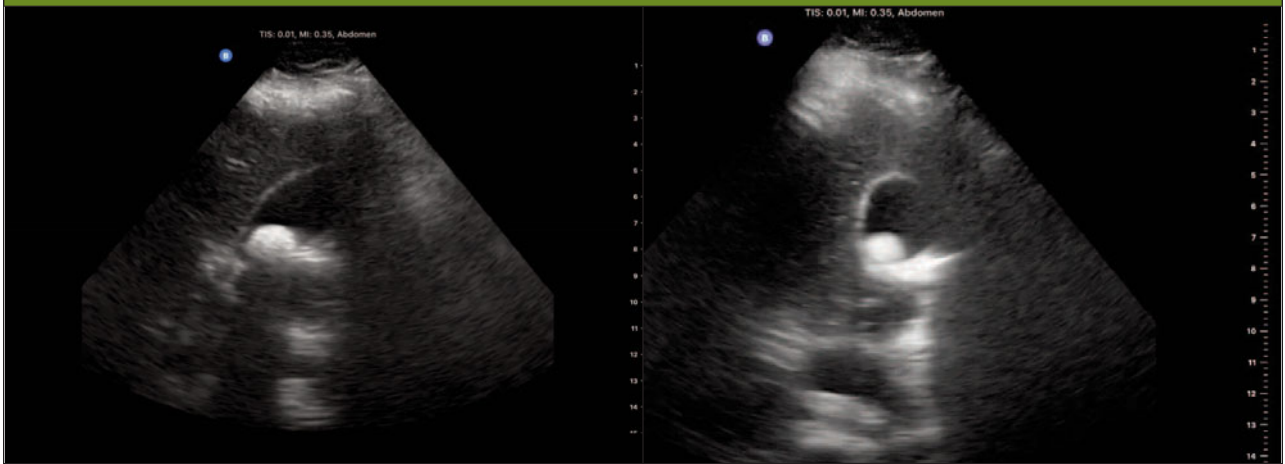
slows emptying of the gallbladder.² Both estrogen and progesterone naturally increase as gestational age advances, therefore increasing the risk of gallstone formation with advanced maternal age. Multiparous women have a higher risk of gallstone development (19%) compared to their nulliparous counterparts (7%).¹

Biliary colic presents in pregnancy much like non-gravid patients,⁶ with constant or intermittent pain in the RUQ that may radiate to the shoulder or scapula. The pain frequently presents as sudden onset often associated with eating, particularly after consumption of a high-fat meal. In general, biliary diseases in pregnancy are considered complicated.

In pregnancy, POCUS can help to identify gallstones, although more serious etiologies (Table 1), still need to be excluded.

Conditions with high morbidity and/or mortality such as acute cholecystitis, appendicitis, ascending cholangitis, HELLP, myocardial infarction, preeclampsia, and pancreatitis deserve careful consideration even in the presence of cholelithiasis seen on POCUS. The literature supports the utilization of POCUS in a variety of specific clinical scenarios to assess for a number of pathologic processes; however, each application needs

Figure 1. Gall stone with posterior shadowing in the neck of the gall bladder.



to be used within the indications and guidelines supported by evidence-based medicine. In the presentation of RUQ pain with or without pregnancy, the personal and family history, risk factors, exam findings, and ancillary tests all add to the clinical decision-making process.

POCUS is both sensitive and specific for assessing the presence of cholelithiasis as well as acute cholecystitis. These sonographic features are synonymous in the pregnant and nonpregnant patients.² Bedside ultrasound can help diagnose biliary pathology and expedite treatment.³

POCUS involves assessing for the presence of:

- Gallstones or sludge
- Gallbladder wall thickening (normal is <3 mm)
- Pericholecystic fluid
- Sonographic Murphy's sign
- Common bile duct (CBD) dilation (normal: <8 mm)

The last four features are characteristic signs of acute cholecystitis.^{1,3,4}

Identifying the dilation of the CBD is the most technically challenging component of a limited RUQ sonographic exam, but is unlikely to be of benefit in patients with normal lab values, without sonographic Murphy's sign, who have a gallbladder wall thickness <3 mm, and have no pericholecystic fluid on POCUS.³

Ultrasound is the preferred imaging modality in pregnancy.⁵ Ultrasound for cholecystitis is 85% sensitive in pregnancy and 95% specific, vs 91.7% sensitivity and 99.1% specificity with CT scan.²

Outcome of Case

With this particular patient, obtaining the POCUS allowed for direct visualization of a stone and empow-

ered the clinician to provide supportive measures immediately. Keeping in context this patient's history, stable/afebrile vitals, and physical exam with additional ultrasonic measurements of a normal gall bladder wall thickness, and the absence of pericholecystic fluid, the clinician had sound reason to treat this pregnant woman with biliary colic in-house.

With her report of fetal movement, no uterine contractions or vaginal bleeding in addition to her ongoing stable vitals and clinical response to medical management, she had no indication for emergent transfer.

This scenario highlights a POCUS opportunity within the scope of urgent care to assist with providing specific answers in the face of acute biliary symptoms in and outside of pregnancy. Bedside ultrasound can reduce resource expenditure as well as reduce time to diagnosis and definitive care. It is important to acknowledge red flags in pregnant individuals who present with acute biliary disease as they are relatively high-risk individuals. UC clinicians may take an opportunity such as this to further patient advocacy and provide interspecialty continuation of care. ■

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