Q: What terms should I be familiar with when evaluating biliary disease in pregnancy?
- biliary colic: the pattern of symptoms associated with biliary disease which includes pain, fullness, nausea and vomiting.
- cholelithiasis: gallstones.
- cholecystitis: inflammation and/or infection of the gallbladder.
- choledocholithiasis: stones in the common bile duct.
- cholangitis: infection of the biliary tree.
- gallstone pancreatitis: inflammation of the pancreatitis due to gallstone obstruction of the pancreatic duct.

Q: What does the gallbladder do and how does it cause problems?
- The gallbladder serves as a bile reservoir. Commonly, stones develop which can then travel and cause a backup of bile which causes symptoms.
- Depending on where they get stuck, the patient is at risk for different problems.

Q: Why is this important in pregnancy?
- Women have a higher incidence of biliary disease and pregnant women are at even higher risk.
- Complications from biliary disease can have significant effects on the outcome of the pregnancy.

Q: What labs and imaging are commonly ordered in the evaluation of biliary disease?
- Labs and imaging for biliary disease include CBC, CMP (including LFTs and bilirubin), lipase and RUQ ultrasound.

Q: What are the typical clinical courses of pregnant patients with biliary disease?
- The most common scenario for pregnancy and biliary disease is biliary colic that is resolved with supportive measures. If it either does not resolve or leads to complications such as cholecystitis, then surgical intervention should be considered.
Q: What does the appendix do?
- Function is still uncertain, tissue there produces some lymphoid tissue that may have an immunologic function.

Q: What are the typical signs and symptoms of appendicitis?
- Abdominal pain that starts near umbilicus and then migrates combined with nausea, anorexia and vomiting are the most common signs.

Q: What are the issues with evaluating appendicitis in pregnancy?
- First, if missed and the appendix ruptures, then there is a significant risk of fetal loss, reported up to 36%.
- Second, the main diagnostic tool used in appendicitis is CT scanning which carries the inherent risk of potentially harmful radiation exposure to the fetus.

Q: What physical exam changes are present in appendicitis in pregnancy?
- Most patients will still have RLQ pain, but up to 20% will have RUQ pain or other less classic findings.

Q: What diagnostic imaging strategies are recommended currently?
- Graded compression ultrasound is the first line of imaging according to current guidelines. It is non invasive, fast, and does not have contrast or radiation exposure. It is highly operator dependent and sometimes is inconclusive.
- MRI has an excellent record of accuracy but it is not widely available.
- CT scanning is still sometimes used despite radiation exposure concerns if U/S is inconclusive and MRI is not available.

Q: What role does clinical judgement play?
- Given the difficulty in balancing risks of surgery with radiation exposure, the surgeon, after a thorough history and physical, and a discussion of risks and benefits with the patient may decide to offer a surgery based on the clinical picture even if a diagnosis has not been confirmed via imaging. For this reason, early referral to a surgery service is recommended since delaying treatment is associated with poor outcomes.
Biliary Disease and Pregnancy

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Outline
- Anatomy and Physiology
- Why we do what we do and terms we use.
- Biliary disease and pregnancy
- Case 1 –
- Questions?

Anatomy
- Gallbladder is in RUQ tucked under the liver
- Usually about 4” long and robin egg blue
- Reservoir for bile
- Stone formation occurs and where this stone gets stuck determines what problems you have

Gallbladder diagram

Picture of gallbladder during lap chole

Gallbladder and Extrahepatic Bile Ducts
Sectioned
What the gallbladder normally does

- When you eat, particularly when you eat fat... bile is injected from the gallbladder into the duodenum to help break down the fat.

What can go wrong

- **Cholelithiasis:**
  - Stones can block some part of the path of bile to the duodenum. Where these get stuck, determines the severity and type of problem the patient experiences.

- **Acalculous biliary disease**
  - Dyskinesia
  - Wall or anatomical abnormalities
  - Sludge

Biliary colic

- Pattern of symptoms associated with gallbladder problems
- Fullness, bloating, nausea, sometimes vomiting and RUQ pain
- These symptoms are thought to be caused by the gallbladder contracting but not emptying...
- Usually transient – 1-5 hours
- About 70% will report that they have had these symptoms, but more mild, in the last 6-12 months.

cholelithiasis

- Stones from Cholesterol 80%
- Stones from pigment 20%
- Stones cause symptoms in 1-4% of patients
- Stones come and go based on physiological factors

**gallstones**
**Gallstones on U/S**

**cholecystitis**

- Meant to imply inflammatory condition but also refers to possible infection.
- In addition to biliary colic symptoms, fever, leukocytosis, murphy’s sign.
- U/S findings: wall thickening, percholecystic fluid and sonographic murphy’s sign.
- Ranges from mild to gangrene, perforated etc.

**Choledocholithiasis**

- Term means Stone caught in the common bile duct.
- Causes biliary colic type symptoms
- Causes backup into the biliary tree and subsequent infection(cholangitis) or backup into pancreatic duct(causes pancreatitis)
- Treatment usually includes ERCP with cholecystectomy.
cholangitis
- Bacterial infection of the biliary tract in a patient with biliary obstruction. (due to stasis)
- Fever, jaundice, abdominal pain.
- Evidence on ultrasound of common bile duct obstruction.
- Sepsis is a big concern.

Gallstone Pancreatitis
- Gallstones are the most common cause of pancreatitis (40% of all cases, 65% of cases in pregnancy)
- Only 3-7% of patients with symptomatic gallstones develop pancreatitis.
- Requires a perfect size of stone.
- Treated quickly with supportive therapy and ERCP and/or cholecystectomy.
- Mortality for mom and fetus used to be very high and complications still remain a big concern.

Clinical Case
- 37 yr old female pregnant female c/o 7/10 crampy RUQ abdominal pain x 8 hours. Some nausea, no vomiting. No fever. 36 weeks gestation, normal pregnancy.

Differential diagnosis 1
- Biliary disease
- UTI/pyo
- Bowel obstruction
- Food poisoning
- Gastroenteritis
- Appendicitis
- PUD
- GERD
- Pneumonia
- Hepatitis

Differential diagnosis 2
- Preeclampsia/HELLP – (HTN, low PLT)
- Acute fatty liver- elevated LFTs, preeclampsia, low BG, DIC, renal failure.
- Abruption – vaginal bleeding, uterine pain
- Uterine rupture – sick. Fetal distress, peritoneal signs. Shock.
- Intraamniotic infection – fever, diffuse abdominal pain, WBC, tachycardia, PROM?
Subjective data

- HPI – pain started approx 1-2 hours after McDonalds. Got steadily worse, no eating or drinking anything for past 6 hours. Feels nauseated but no vomiting. Pain comes in waves and radiates to right shoulder.
- ROS – no fever, no wt loss. No constipation or diarrhea, no dysuria, hematuria or frequency.
- PMHx, medications, allergies all unremarkable.

Biliary disease and pregnancy

- Gallstones are more common in women, and much more common in pregnancy
  - Estrogen increases cholesterol secretion
  - Progesterone slows gallbladder emptying causing stasis
  - Pre-pregnancy obesity is a major risk factor
  This risk appears to increase all the way until about 6 weeks post partum.
  After that, over half of patients with gallbladder sludge had resolution on ultrasound and about a third who had small stones had negative ultrasounds.

Old sayings

- "Fair, female, fat , fertile”.
- ? Contraceptives increase gallstones

How many patients have problems?

- Less than 10% of patients who had symptoms and stones developed a complication like acute cholecystitis, pancreatitis, cholangitis etc.

Objective data

- Vitals normal
- PE shows pregnant female NAD. Abd soft, mild tenderness to RUQ otherwise nontender, no murphy’s sign. No CVAT. BS nl x 4 quadrants.
- Strip normal without contractions.

What labs and imaging to order?
Labs and imaging

- UA (proteinuria, UTI)
- CBC (HELP, infection, shock)
- CMP (lytes + LFTs) (fatty liver, hepatitis)
- Bilirubin (choledocholithiasis)
- Lipase (pancreatitis)
- Ultrasound RUQ (stones and or complications from stones)

What not to get:

- CT
- MRI
- HIDA scan
- X-ray

Management

- IV fluid for hydration
- Anti nausea medication
- Opiate analgesia
- Observation and ruling out of other causes.
- NPO
- Abx if infection is suspected – (zosyn)

A phone call to the surgery service is a good idea...

Here is what we will say:

- IF you are feeling sure the symptoms are biliary and there is no reason to suspect any other problem...then:
- If symptoms improve with supportive treatment, then its biliary colic and patient can be counseled and sent home. Can likely wait for delivery for intervention. This happens often and we like this... especially near term.
- We often see people back in our office at about 6 weeks. Important to note that symptoms, and indeed sometimes even the stones themselves can disappear. It is then a decision between patient and surgeon whether to consider surgery.
Evidence based treatment?

- All evidence is retrospective and observational.
- Much of the research was done before laparoscopic surgery became widespread.
- No randomized trials.
Historical dogma has been to not operate in the first trimester due to spontaneous abortion and congenital abnormalities and not to operate in the third trimester due to premature labor. These guidelines are now becoming old fashioned due to the risks of non treatment and established safety of surgery.

Recurrent biliary colic in pregnancy

- If symptoms do not get better with conservative treatment or if there are recurrent symptoms... but there is no sign of complicated biliary disease... then surgery and midwifery need to discuss the advantages to surgery.
- Is the pregnancy adversely affected?
- Is it likely to go on for a long time (how close to delivery?). The longer the symptoms go on, or the more flare ups.. The more risk of a complication.
- Thus, the closer to term... the more reluctant we are to operate. The earlier in the pregnancy.. The more it makes sense to intervene.

cholecystitis

- Recurrence rates are about 50%.
- Each recurrence is risky for mom and fetus.
- Each recurrence represents a possibility for a complication.
- Thus, operative management is usually recommended because of relapse and readmission rates.
- If it is thought to be very mild symptoms then non operative management can be tried, especially near term.
- There is no data to support or refute the idea of induction in near term cases. In my practice, we prefer to have poor surgical candidates induced prior to cholecystectomy if gestational age allows.

Cholangitis, choledocholithiasis, pancreatitis

- It is time to get official consults from general surgery, GI and possibly the hospitalist service.
- You need these consultants to see the patient immediately and decide on management.

references


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questions

- Aaron Huston – hustona@seattleu.edu
Appendicitis in pregnancy
Aaron Huston, ARNP

Overview
- Appendicitis – classic presentation
- Evaluation and treatment of non-pregnant appendicitis
- Appendicitis in pregnancy
- Factors that might help decide
- Diagnostic imaging in pregnancy

Understanding the difficulty
- As opposed to biliary disease, where the diagnosis is straightforward but treatment decisions are complicated.....
- Treatment decisions for appendicitis are straightforward once appendicitis is confirmed. It is the diagnosis that is the difficult part.

Appendicitis in pregnancy
- Fetal loss if appendicitis is missed and ruptures is reported at 36% versus 1.5% after appendectomy.
- Most common non-OB surgery in pregnancy

Clinical Case
- 38 yr old female 28 weeks gestation complains of gradual onset 7/10 abdominal pain that is primarily in her RLQ. She has nausea and states “I feel terrible”.
- No fever, no dysuria. No vomiting or bowel changes. No urinary changes. Normal pregnancy. No vaginal bleeding or d/c. This is her second pregnancy, never felt this pain before. No radiation.
- Vitals are nl.
- PE shows an adult female in NAD. Abdominal exam shows pain diffuse pain in the right side of the abdomen. No rebound. No CVAT. +BSx4. rest of exam including pelvic unremarkable.

Differential diagnosis
- Ectopic
- Pregnancy blahs
- Round ligament
- Pylo/UTI
- Preeclampsia/HELLP
- Abruption/rupture
- Adhesions
- Ovarian issues
What is the appendix?

- Earthworm shaped structure at cecum.
- Function not certain – makes lymphoid pulp that aids immunologic function.
- Obstruction due to fecolith or tissue is commonly implicated in appendicitis.
- Severity varies... infected, perforated, gangrenous.
Classic presentation
- Abdominal pain starts around umbilicus and then migrates to RLQ.
- Anorexia, nausea and vomiting.
- Nonclassic presentations are common.
- Heartburn, bowel irregularity, flatulence, malaise, diarrhea, rectal or urinary symptoms

Classic appendicitis
- Tender over McBurney’s point
- Rebound tenderness
- Fever
- WBC
- CT scan shows appendicitis.
- To OR for laparoscopic appendectomy.

Appendicitis in pregnancy
- RLQ pain 75%
- RUQ pain 20%
- Nausea 85%
- Vomiting 70%
- Anorexia 65%
- Dysuria 8%
- WBC with left shift 80%

What labs and imaging to order?

Labs and imaging
- CBC, UA, BMP
- Some sort of imaging….What is the goal of imaging?

ultrasound
- The imaging modality of choice in pregnancy is Ultrasound. Ultrasound has distinct advantages, but is less reliable in pregnancy and is poor at excluding appendicitis.
- Factors that affect ultrasound are gestational age, BMI, and most importantly…. training of the ultrasonographer and radiologist.
MRI
- Excellent tool. Sensitivity reported at 100% and specificity at 93%.
- Expensive
- Some patients cannot tolerate MRI.
- Not widely available.

CT
- There are some new, lower rad protocols.
- Guidelines on the use of CT in pregnancy are tricky.
- Some sources use CT as second line if MRI is not available.
- It is many surgeons practice to use clinical judgement in these cases rather than risk the radiation exposure.

pearls
- Pain that progresses and does not get better.
- Nausea.
- Anorexia “do you feel hungry?”
- Ultrasound is great – go ahead and order it.
- After the results, call surgery team to help decide where to go next.

Outpatient considerations
- Probably, this will need to take place at an ER or hospital that has U/S capability and even better MRI capability. Checking on this might be a good idea before sending patient.
- If you practice in a location without either of these, then contacting a surgeon directly may help to get an idea of what they would like to do for evaluation.
references

- http://www.uptodate.com/contents/acute-appendicitis-in-pregnancy?source=search_result&search=appendicitis+pregnancy&selectedTitle=1%7E150#H4

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