Management of Biliary Disease in the Pregnant Patient

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SURGERY GRAND ROUNDS
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23yo obese g4p3 F 28wks pregnant with 3 days back pain and RUQ pain after meals since 10 wks gestation

PMH: mild gallstone pancreatitis at 20wks gestation

PSH: none

Labs: WBC 11   bili 1.3   alk phos 265
      AST/ALT 100/79   lipase 2599
RUQ US: gallstones. No gallbladder wall thickening, pericholecystic fluid, or sonographic Murphys sign, CBD 4mm
MANAGEMENT

- Amylase, lipase, bilirubin returned to normal after 2 days NPO
- Underwent open cholecystectomy with fetal heart rate monitoring
- Findings: chronic cholecystitis
- Postoperative course: diet advanced, discharged home POD 5
Non-obstetric surgery is necessary in up to 1% of pregnancies in the US each year.

Cholecystectomy for symptomatic cholelithiasis is second to appendectomy as the most common nonobstetric surgical procedure performed during pregnancy.

Complications from nonoperative management of gallstone disease result in an increase in maternal & fetal mortality.

For expectantly managed gallstone pancreatitis, maternal mortality of 15% and fetal mortality of 60% have been reported.
Abdominal discomfort, nausea, vomiting, diarrhea, and constipation are often encountered in pregnancy in the absence of intra-abdominal pathology.
PHYSIOLOGIC CHANGES IN PREGNANCY

- Gallbladder volume doubles in the 2\textsuperscript{nd} & 3\textsuperscript{rd} trimesters
- Gallbladder emptying is markedly slower than in the nonpregnant state
- Up to 4\% of pregnant patients have gallstones on routine obstetric ultrasound
- Only 1 in 1000 pregnant patients develops symptoms
## Differential Diagnosis of RUQ Pain in the Pregnant Patient

<table>
<thead>
<tr>
<th>Left Column</th>
<th>Right Column</th>
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</thead>
<tbody>
<tr>
<td>• Gastroesophageal reflux</td>
<td>• HELLP syndrome</td>
</tr>
<tr>
<td>• Peptic ulcer disease</td>
<td>• Preeclampsia</td>
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<tr>
<td>• Acute cholecystitis</td>
<td>• Pneumothorax</td>
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<tr>
<td>• Biliary colic</td>
<td>• Pneumonia</td>
</tr>
<tr>
<td>• Acute pancreatitis</td>
<td>• Acute appendicitis</td>
</tr>
<tr>
<td>• Hepatitis</td>
<td>• Hepatic adenoma</td>
</tr>
<tr>
<td>• Acute fatty liver of pregnancy</td>
<td>• hemangioma</td>
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**www.downstatesurgery.org**
Ultrasound remains the initial imaging study of choice in the evaluation of the pregnant woman presenting with acute abdominal pain.
Radiation exposure > 15 rads may lead to chromosomal mutations, neurologic abnormalities, mental retardation, and risk for leukemia especially between 10 to 17 wks gestation.

<table>
<thead>
<tr>
<th>Examination type</th>
<th>Est fetal radiation dose (cGy)</th>
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<tbody>
<tr>
<td>Chest X ray</td>
<td>0.00007</td>
</tr>
<tr>
<td>Abdominal CT</td>
<td>2.6</td>
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<tr>
<td>HIDA scan</td>
<td>0.15</td>
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<tr>
<td>Cholangiography</td>
<td>0.5</td>
</tr>
<tr>
<td>ERCP</td>
<td>2-12</td>
</tr>
<tr>
<td>Fluoroscopy</td>
<td>20 rads/min</td>
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</table>
ULTRASONOGRAPHIC IMAGING DURING PREGNANCY IS SAFE AND USEFUL IN IDENTIFYING THE ETIOLOGY OF ACUTE ABDOMINAL PAIN IN THE PREGNANT PATIENT.

EXPEDITIOUS AND ACCURATE DIAGNOSIS SHOULD TAKE PRECEDENCE OVER CONCERNS FOR IONIZING RADIATION. CUMULATIVE RADIATION DOSAGE SHOULD BE LIMITED TO 5-10 RADS DURING PREGNANCY.

INTRAOPERATIVE AND ENDOSCOPIC CHOLANGIOGRAPHY EXPOSES THE MOTHER AND FETUS TO MINIMAL RADIATION AND MAY BE USED SELECTIVELY DURING PREGNANCY. THE LOWER ABDOMEN SHOULD BE SHEILED WHEN PERFORMING CHOLANGIOGRAPHY.
Aortocaval compression by the gravid uterus in the supine position in the latter half of pregnancy can be overcome by placing a wedge under the right hip during positioning.

Initial abdominal access can be accomplished with open, veress needle or optical trocar techniques.

Camera port must be placed in supraumbilical position later in pregnancy, and remaining ports placed under direct visualization.
LAPAROSCOPIC TREATMENT OF ACUTE ABDOMINAL DISEASES HAS THE SAME INDICATIONS IN PREGNANT AND NON-PREGNANT PATIENTS

LAPAROSCOPY CAN BE SAFELY PERFORMED DURING ANY TRIMESTER OF PREGNANCY

INSUFFLATION PRESSURE OF 10-15 MMHG CAN BE SAFELY USED FOR LAPAROSCOPY IN THE PREGNANT PATIENT
MANAGEMENT OF BILIARY DISEASE

- Diagnosis made based on same symptoms, laboratory & radiographic criteria
- Biliary Colic
- Acute cholecystitis
- Choledocholithiasis
- Gallstone pancreatitis
- Cholangitis
In a review of 12K patients, maternal mortality was 0.006% and miscarriage rate 5.8% after nonobstetric surgery.
## Laparoscopy vs. Laparotomy

<table>
<thead>
<tr>
<th>ADVANTAGES TO LAPAROSCOPY</th>
<th>DISADVANTAGES TO LAPAROSCOPY</th>
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<tbody>
<tr>
<td>Decreased fetal narcosis</td>
<td>Risk of uterine injury during trocar placement</td>
</tr>
<tr>
<td>Lower rates of wound infections &amp; hernias</td>
<td>Decreased uterine blood flow</td>
</tr>
<tr>
<td>Diminished maternal hypoventilation</td>
<td>Increased risk of fetal acidosis from CO2 pneumoperitoneum</td>
</tr>
<tr>
<td>Decreased uterine manipulation</td>
<td>Decreased visualization with gravid uterus</td>
</tr>
<tr>
<td>Faster recovery</td>
<td></td>
</tr>
<tr>
<td>Decreased risk of ileus</td>
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</table>
LAPAROSCOPIC CHOLECYSTECTOMY IS THE TREATMENT OF CHOICE IN THE PREGNANT PATIENT, REGARDLESS OF TRIMESTER

CHOLEDOCHOLITHIASIS DURING PREGNANCY MAY BE MANAGED WITH PREOPERATIVE ERCP WITH SPHINCTEROTOMY FOLLOWED BY LAPAROSCOPIC CHOLECYSTECTOMY, LAPAROSCOPIC CBD EXPLORATION, OR POSTOPERATIVE ERCP
Based on direct effects of anesthetic agents and effects of maternal hypotension on fetus

No definitive evidence to link anesthesia with fetal outcome, but given that differentiation of the major organ systems occurs in the 1st trimester, delaying semielective surgical procedures until the 2nd trimester may theoretically reduce risk for teratogenicity

Risk for preterm delivery is highest in the 3rd trimester

Delays in treatment have also been shown to increase the chance of preterm labor
### PERIOPERATIVE MEDICATIONS

<table>
<thead>
<tr>
<th>SAFE</th>
<th>AVOIDED</th>
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<tr>
<td>ACETAMINOPHEN</td>
<td>NSAIDS</td>
</tr>
<tr>
<td>MORPHINE or FENTANYL PCA</td>
<td></td>
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<tr>
<td>Decrease respiratory depression &amp; drug transfer to fetus</td>
<td></td>
</tr>
<tr>
<td>1ST &amp; 2&lt;sup&gt;ND&lt;/sup&gt; GEN CEPHALOSPORINS</td>
<td>CIPROFLOXACIN</td>
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FETAL MONITORING

- Before and after surgery if 1\textsuperscript{st} or 2\textsuperscript{nd} trimester
- Continuous intraoperative monitoring in late 2\textsuperscript{nd} and in 3\textsuperscript{rd} trimester whenever possible
- Transvaginal ultrasound can be used during abdominal operations
FETAL HEART MONITORING SHOULD OCCUR PREOPERATIVELY AND POSTOPERATIVELY IN THE SETTING OF URGENT ABDOMINAL SURGERY DURING PREGNANCY

TOCOLYTICS SHOULD NOT BE USED PROPHYLACTICALLY IN PREGNANT WOMEN UNDERGOING SURGERY BUT SHOULD BE CONSIDERED PERIOPERATIVELY WHEN SIGNS OF PRETERM LABOR ARE PRESENT
Question 1

Which of the following physiologic changes does NOT occur during pregnancy?

- A: dilutional anemia
- B: mild, compensated respiratory acidosis
- C: increased cardiac output
- D: decreased gastric and intestinal motility

B
During pregnancy, when is the optimal time to perform abdominal operations?

- A: 5 to 9 weeks
- B: 10 to 13 weeks
- C: 15 to 18 weeks
- D: 26 to 28 weeks
- E: after 32 weeks
Regarding laparoscopy during pregnancy, which of the following is recommended?

- A: Antibiotic prophylaxis with a fluoroquinolone
- B: Right lateral decubitus position
- C: Limiting carbon dioxide pneumoperitoneum to 12 mmHg
- D: Using an umbilical entry site for laparoscopy for gestational ages beyond 24 weeks
- E: Performing open rather than laparoscopic procedures after 24 weeks gestation

C