Abdominal pain in pregnancy

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• Normal physiologic changes that occur in pregnancy may obscure recognition of non-obstetric emergencies which threaten the mother and fetus
• These include
  – increased abdominal girth,
  – elevation of certain serum enzyme levels, and
  – alteration of the adrenocortical state
• Make it difficult to interpret signs usually used in early diagnosis of emergency conditions

Etiology of pain

Surgical conditions
- Appendicitis
- Biliary disease
- Cholecystitis
- Pancreatitis
- Bowel obstruction

Non-surgical conditions
- Ovarian cysts
- Renal/ureteral calculi
- Pyelonephritis

Trauma
- Motor vehicle accident
- Assault

Appendicitis

• Occurs in 1 in 1500 pregnancies
• Appendix undergoes a progressive upward displacement, reaching the level of the iliac crest by the end of the sixth month
• 25-40% perforation present at surgery
• Fetal loss
  – In 2% to 4% pregnant patients with appendicitis without perforation
  – 24% of cases perforation is present at surgery
  – 3-10% related to negative appendectomy

Appendicitis

• Increased risk of preterm labor in the first post operative week
• Elraiyah et al (J Surg Research, 2014)
• Performed a meta-analysis to see effect of ruptured appendicitis and appendectomy on fertility and future ectopics
• Significantly increased risk of future ectopic but no effect on fertility

Utility of US for evaluation of appendicitis in second and third trimester

• Lehnert et al. (Emerg Radiol, 2012)
• Retrospective review of 99 pregnant patients over 10 year period
• 97% appendix not visualized on US
• Concluded US not very effective in second and third trimester
Utility of CT for evaluation of appendicitis

- Woussen et al [Eur Radio, July 2015]
- Evaluated the number of CT and radiation dose at their university hospital
- Number of CT exams increased almost 3X over 5 year period
- Radiation dose to fetus was negligible for CT of head and neck and chest. Abdominal dose higher at a range of 28.7mGy
- This is similar to other published data

Utility of MR for evaluation of appendicitis

- Burke et al [AJOG, July 2015]
- MRI in imaging of acute appendicitis in pregnancy: a 5 year multi-center study
- Review all MRI for appendicitis between 2009-2014
- Sensitivity 96.8%, specificity 99.2%, accuracy 99%, PPV 92.4%, NPV 99.7%
- MRI useful and reproducible tool for diagnosis of acute appendicitis in pregnancy

Imaging findings suggestive of acute appendicitis on unenhanced CT: include a thickened appendix, greater than 6 mm in diameter, and evidence of periappendiceal inflammation, including fat stranding, phlegmon, fluid collection, and extraluminal air.

Imaging findings suggestive of acute appendicitis on MRI: periappendiceal inflammation is visualized as bandlike areas of high signal intensity on T2-weighted images and single-shot fast spin-echo images.

SO, What should I do
Management

- Surgical management necessary – either open or closed appendectomy
- Antibiotic coverage needed in suspected perforation

Intestinal Obstruction

- 1 in 1500 to 1 in 3000 pregnancies.
- Incidence increases throughout pregnancy with highest incidence in 3rd trimester
  - Due to enlarging uterus encroaching on the abdominal cavity.
- Etiology:
  - Adhesions from previous surgical interventions
  - Pelvic inflammatory conditions
  - Volvulus – 25% and
  - Intussusception – 5%

- Presentation:
  - Abdominal pain,
  - Nausea
  - Obstipation
  - Feculent and foul-smelling emesis
- Increased abdominal girth associated with obstruction is not easily distinguished from the effect of increased uterine growth

Management

- Initially managed with fluid and electrolyte replacement and bowel decompression via nasogastric suction.
- Viability of the bowel can be determined only by inspection.
- Aggressive intervention is warranted because maternal mortality can reach 20% and infant mortality more than double that.
Biliary disease

- Manifests as cholestasis, cholecystitis, choledocholithiasis or gallstone pancreatitis
- Symptoms: similar to non-pregnant patient
  - nausea, vomiting, acute onset of colicky or stabbing mid-epigastric pain, or right upper quadrant pain
- elevated levels of direct bilirubin and transaminases

Differential diagnosis:
- Appendicitis
- Fatty liver of pregnancy,
- Preeclampsia,
- HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome,
- Myocardial infarction,
- Pancreatitis,
- Hepatitis,
- Peptic ulcer disease,
- Pneumonia,
- Pyelonephritis, and
- Herpes zoster

Management

- Managed with abstinence from oral intake and nasogastric suction, pain control, and antibiotics.
- Indications for surgery include failure to respond to conservative treatment, systemic toxicity, and recalcitrant pancreatitis.
- Surgery in the second trimester results in the best fetal outcome; intervention in the third trimester is associated with premature labor.

Pancreatitis

- Occurs in 1 in 1000 to 1 in 5000 pregnancies
- More common in 3rd trimester
- Common causes include
  - Gallstones
  - Medications
  - Infections
  - Alcohol and
  - Hyperlipidemia
- Presentation: Severe epigastric pain that radiates to the back, nausea, vomiting, and fever

Management

- Treated conventionally with oral abstinence, nasogastric suction, analgesics, and intravenous feedings.
- Surgical interventions are reserved for those with abscess, ruptured pseudocyst, or hemorrhagic pancreatitis.
- Endoscopic retrograde cholangiopancreatography with papillotomy may be appropriate for gallstone-induced pancreatitis

Arterial aneurysms

- potentially fatal consequences as life-threatening hemorrhage
- first report by Beaussier in 1770
- Initial recognition and diagnosis of splenic artery aneurysm may occur after rupture.
- mostly occurs in the third trimester, during labor, or in the early postpartum period.
- Medial degeneration, hormonal and local hemodynamic factors, and elevated blood pressure all have been implicated in the development of the splenic artery aneurysms in pregnancy
Trauma

• Occurs in 7% of pregnancies
• Most common causes of trauma
  – Motor vehicle accidents
  – Falls
  – Direct assaults to the abdomen
• Increased risk of fetal loss and abruptio placentae
• Major injuries (long bone fractures, rib fractures, or life-threatening injuries) may result in a 41% fetal loss
• Fetomaternal hemorrhage occurs four to five times more frequently in gravid patients who have been injured than in those who have not been injured

Management

• Stabilization of the mother – fluid, oxygen, airway etc, trauma series – radiographs and/or CT as needed
• Avoid vasopressors – cause decrease in uterine blood flow
• Fetal assessment – determination of fetal heart tones and estimation of age.
• If not heart tones – Ultrasound recommended.
• If fetus shows signs of distress – emergency C-section

Conclusion

• Nonobstetric emergencies in pregnancy present a challenge to health care providers
• Must remain cognizant that the normal physiologic state of pregnancy causes alterations in presentation and management of many clinical situations.
• Important for clinicians to keep these alterations in mind, first, to be able to recognize hypotension, hypoxia, and acidosis in the gravid patient and, second, to be able to appropriately manage them.