Non obstetric surgical emergencies in Pregnancy
Diagnosis and Management

Dott. Stefano Sassi
U.O. Chirurgia Generale
Ospedale Santa Maria Bianca
Mirandola (MO)
Direttore
Dott. Ernesto Tamborrino
Objectives

1. History, Physical, Investigations:
   • How they differ in pregnancy

1. Differential Diagnosis of acute abdominal pain

1. Diagnostic Imaging: US/ CT/ MRI

1. A review of some of the more common causes of acute abdomen in pregnancy

1. In the Operating Room
   • Laparoscopy vs. Laparotomy
   • Issues specific to pregnancy
Scope of the Problem

- **Definition of Acute Abdomen:**
  - Intra-peritoneal acute disease best treated surgically

- ~1/500 women need non-obstetrical abdominal surgery during pregnancy

- **Most common non-obstetrical surgical emergencies:**
  1. Acute appendicitis
  2. Cholecistitis
  3. Intestinal Obstruction
  4. Pancreatitis
  5. Trauma
• “Earlier diagnosis means better prognosis”
  Sir Zachary Cope 1921

• Weigh risks and benefits of diagnostic modalities and therapies for both mother and fetus
Differential Diagnosis

Acute Abdomen in Pregnancy

Pregnancy Related

Gyne

Adnexal Accident, fibroid Degeneration…

Non-Gyne

GI

GU

Vascular
Common causes of acute abdominal pain

Right upper quadrant
- Acute hepatitis
- Acute pancreatitis
- Cholangitis
- Cholecystitis
- Cholelithiasis
- Duodenal ulcer
- Dyspepsia
- Hepatic abscess
- Hepatomegaly due to heart failure
- Herpes zoster
- Myocardial infarction
- Pericarditis
- Pneumonia
- Retrocecal appendicitis

Left upper quadrant
- Acute pancreatitis
- Duodenal ulcer
- Dyspepsia
- Gastric ulcer
- Gastritis
- Myocardial infarction
- Pericarditis
- Pneumonia
- Splenic abscess
- Splenic infarct
- Splenic rupture

Right lower quadrant
- Appendicitis
- Bowel obstruction
- Diverticulitis
- Ectopic pregnancy
- Endometriosis
- Hernia
- Inflammatory bowel disease
- Irritable bowel syndrome
- Kidney stones
- Meckel's diverticulitis
- Mesenteric adenitis
- Mittelschmerz
- Ovarian cyst
- Ovarian torsion
- Pelvic inflammatory disease/
  tubo-ovarian abscess
- Psoas abscess
- Spontaneous/threatened abortion

Left lower quadrant
- Bowel obstruction
- Diverticulitis
- Ectopic pregnancy
- Endometriosis
- Hernia
- Inflammatory bowel disease
- Irritable bowel syndrome
- Kidney stones
- Mittelschmerz
- Ovarian cyst
- Ovarian torsion
- Pelvic inflammatory disease/
  tubo-ovarian abscess
- Psoas abscess
- Spontaneous/threatened abortion

Diffuse
- Acute pancreatitis
- Bowel obstruction
- Dissecting aorta
- Early appendicitis
- Gastroenteritis
- Inflammatory bowel disease
- Irritable bowel syndrome
- Mesenteric infarct/ischemia
- Peritonitis
- Ruptured abdominal aortic aneurysm
- Sickle-cell crisis
Difficult Diagnosis

• Expanding uterus dislocates other intra-abdominal organs

• High prevalence of nausea, vomiting and abdominal pain in pregnancy

• General reluctance to operate in pregnancy
History

- P – Pain: onset, duration, intensity, character
- Q - Quality
- R – Radiates
- S – Severity
- T - Time

- Gestational age

- Associated symptoms – All frequent in normal pregnancy:
  - Nausea & vomiting
  - Constipation
  - Increased frequency of urination
  - Pelvic / Abdominal discomfort
Physical

• Peritoneal signs are often absent in pregnancy
  – lifting and stretching of the anterior abdominal wall
  – underlying inflammation has no direct contact with the parietal peritoneum
  – precludes muscular response or guarding that is expected

• The uterus can obstruct and inhibit the movement of the omentum to an area of inflammation

• < 24 weeks – document FHR

• > 24 weeks - A reassuring tracing allows the evaluation to continue at an appropriate pace

• Monitoring for contractions:
  – Throughout the evaluation period
  – After definitive treatment
Investigations

- Labs:
  - ↑WBC (T2 <16, T3 <20-30 in early labour)

- Ultrasound
- CT
- MRI
Ultrasound

- Safe

- Relatively high sensitivity and specificity

- Test of choice for most ob/gyn causes of abdominal pain

- Also useful first line test for many non-gyne conditions
Risk of Ionizing Radiation

• Risk based on gestational age and radiation dose

• First trimester: all or nothing phenomenon

• Most sensitive time for CNS teratogenesis is 10-17 wks

• In T2 and T3 – risk is childhood haematologic malignancy
  – Background risk is 0.2-0.3% of childhood cancer and leukemia –
    Increased risk by 0.06% per rad of exposure

• No single study should exceed 5 rads

• Accepted cumulative dose of ionizing radiation in pregnancy is 5-10 rads
MRI

- Safe in pregnancy for mother or fetus

- Becoming standard of care for investigation of placental implantation abnormalities, and further delineation of fetal anomalies

- Issue is contrast media
Treatment

• Conservative…

• Surgical
  – Laparoscopy
  – Laparotomy

• Obstetrical issues:
  – Preterm labour
  – Intra-op monitoring
  – Tocolyis
  – Delivery
Appendicitis

- Most common non-obstetric cause of surgical emergency in pregnancy
- Incidence: 1 in 500
- Pregnancy does not affect the overall incidence of appendicitis, but severity may be increased in pregnancy
- Appendicitis more common in T2 (40% of cases)
- Majority present with classic RLQ pain
- 25% of pregnant women will perforate
  - Don’t delay O.R. >24 hrs, ↑ perforation rate from 0% to 66%
  - Perforation occurs 2x more often in the T3 than T1,2
History

• Most reliable symptom is RLQ pain

• Nausea is present in nearly all cases

• Vomiting present in two thirds of patients

• Anorexia is present in only 1/3 – 2/3 of pregnant patients, while it is present almost universally in Non-pregnant patients
Physical

- Direct abdominal tenderness most common
  - T1: Tenderness well localized in RLQ
  - T2, T3: tenderness may change location: right periumbilical area, RUQ, diffuse

- Classic Signs:
  - Rebound present in 55-75% of patients
  - Abdominal muscle rigidity in 50-65%
  - Psoas sign observed less frequently in pregnancy
  - The Rovsing sign as frequent in pregnancy as non-pregnancy state

- Rectal tenderness is usually present, particularly in the first trimester
- Fever and tachycardia are variably present; not sensitive signs
- Uterine activity due to localized peritonitis is common
Investigations

• US is imaging of choice
  – Accuracy is greatest in T1; in T2 and T3 up to 40% normal appendix rate

• General Laboratory Investigations:
  – Elevated WBC
  – Neutrophils often >80%
  – Urinalysis: Pyuria is observed in 10-20%
Treatment

• Surgical: Laparotomy or laparoscopy

• If the appendix appears normal remove it because:
  (1) Early disease may be present despite its grossly normal appearance
  (2) Diagnostic confusion can be avoided if the condition recurs

SAGES
Society of American Gastrointestinal and Endoscopic Surgeons
http://www.sages.org

A. Uncomplicated Appendicitis

GUIDELINE: Laparoscopic appendectomy is a safe and effective method for treatment uncomplicated appendicitis and may be used as an alternative to standard open appendectomy. (level I, grade A)
Acute appendicitis and Diffuse Peritonitis (Perforation)

- Cefuroxime, ampicillin, metronidazole, oxygen pre-op
- Depending on G.A. consider CS as fetal loss rate up to 20-36%
- Pre-op intubation and ventilation in cases of hypovolemia
- Copious irrigation and use of intra-peritoneal drain

B. Perforated Appendicitis

GUIDELINE: Laparoscopic appendectomy may be performed safely in patients with perforated appendicitis. (Level II, grade B) \[8, 17\] and is possibly the preferred approach (level III, grade C)
Morbidity

- Perforation and abscess formation are more likely to occur in pregnant patients

- The rate of generalized peritonitis relates directly to the interval of time from symptom onset to diagnosis

- Maternal and fetal morbidity and mortality rates increase once perforation occurs

- Fetal mortality is dependant on if perforation is present: 20-35% vs. 1.5% is no perforation

- PTL/PTD is common – 5-14%, up to 50% in T3

- Maternal mortality should be <1%
Acute Cholecystitis

- Incidence in pregnancy is 1:2000
- Second most common cause of acute abdomen in pregnancy
- Cholelithiasis is the cause in 90% of cases
- Incidence of cholelithiasis in pregnant women having routine OB scans is 3.5-10%
History and physical examination

• Previous history; dyspepsia, intolerance of fatty foods
• RUQ/ mid-epigastrium pain; may radiate to the back
• Nausea & Vomiting ~ 50% of cases
• Fever occasionally
• Direct tenderness usually present in RUQ, Rebound tenderness is rare
• Cholecystitis can mimic appendicitis in the third trimester
Investigations

• Blood tests are of limited value
  – ↑ WBC, ↑ ALP – normal in pregnancy
  – AST/ALT may help distinguish cholecystitis from hepatitis
  – Amylase elevated transiently ~1/3; high amylase suggests pancreatitis
Investigations

- Ultrasound is diagnostic
  - Gall bladder calculi: present in > 95% with acute cholecystitis
  - Wall thickening > 3mm
  - Pericholecystic fluid
  - Sonographic Murphy’s sign
  - Dilation of intra and extra-hepatic ducts in common bile duct obstruction
Treatment

- Supportive: Intravenous fluids, I.V. antibiotics

**Non-surgical Management increases risk of:**

- Recurrence in pregnancy if episode occurs:
  - T1 92%
  - T2 64%
  - T3 44%

- Gallstone pancreatitis ~13% (Fetal loss rate 10-60%)
  - ↑ SA, ↑PTL, ↑PTD

- A percutaneous drainage procedure may be indicated in select patients in order to defer definitive surgery
Surgical Management

• Recently immediate surgical management is used more widely because:

  1. Reduced use of medications
  2. Recurrence rate in pregnancy is 44-92%, depending on trimester
  3. Shorter hospital stay
  4. ↓ risk of developing life-threatening complication: perforation, sepsis, peritonitis

• “Laparoscopy or laparotomy – depends on GA and surgeon skill”

Guideline 15: Laparoscopic cholecystectomy is the treatment of choice in the pregnant patient with gallbladder disease, regardless of trimester (Moderate; Strong).
Bowel Obstruction

• Third most common cause of acute abdomen in pregnancy: 1:1500 – 1:16,000

• **Etiology:**
  1. Adhesions – 60-70% of cases

  1. Volvulus ~25% of cases (much higher than non-pregnant)
     * Risk of cecal volvulus is highest at times of rapid changes in uterine size (16-20 wks, and 32-36 wks)
     * Any redundant or abnormally mobile cecum is raised out of the pelvis and allows for rotation around a fixed point
     * Small bowel volvulus is more common in T3 and PP

  2. <5% of time: Intussusception, incarcerated hernia, cancer, diverticulosis etc.
History

• Cramped abdominal pain ~90%
  – Constant or periodic, mimicking labor
  – Pain may radiate to the flank, imitating pyelonephritis
  – The severity of pain may not reflect the severity of disease

• Vomiting

• Constipation
Physical findings

- Classic distended tender abdomen with high-pitched bowel sounds is the exception in pregnancy

- Uterus/cervix/adnexa share the same visceral innervation as the lower ileum, sigmoid colon and rectum - separating GI and Gyn sources of pain is often difficult

- Abdominal tenderness may be absent

- Bowel sounds are often normal upon presentation

- A tender cystic mass can sometimes be palpated

- Rebound tenderness, fever, and tachycardia occur late in the course
Laboratory Studies

- Leukocytosis may be present
- Electrolyte abnormalities
- Hemoconcentration
- Elevated serum amylase levels

- X-Ray
  - Abdominal Plain film - best initial study
  - Sequential films may be needed
  - Air-fluid levels, progressive bowel dilation
Treatment

**Conservative**
- Fluid and electrolyte replacement
- NG suction
- Enema

**Surgical**
- Midline abdominal incision
- Decompress the bowel
- Relieve obstruction
- Resect nonviable tissue

**Prognosis**
- Maternal Mortality ~6%
- Fetal mortality ~26%
- Bowel strangulation requiring resection ~23%
With increasing experience with this technique, there are fewer barriers. Reports of successful appendectomy and cholecystectomy in the third trimester.
Pre-Op Decision Making

• Laparoscopy has the same indications as the non-pregnant patient

• Approach is based on skill of surgeon and availability of staff/equipment

• Benefits of Laparoscopy:
  – ↓ post-op pain
  – ↓ post-op ileus
  – ↓ LOS
  – Faster return to work
Benefits in the Pregnant Patient

• ↓ fetal depression due to less narcotic use

• ↓ risk of wound complications

• ↓ post-op maternal hypoventilation

• ↓ risk of VTE due to early mobilization

• ↓ uterine irritability leads to less PTL
Conclusions

• Laparoscopy is safe in all trimesters of pregnancy

• The Veress needle can be used – depends on surgeon experience with ‘alternate site’ entries

• Pressure of 12 mmHg – less than uterine ctx.

• Laparoscopy decreases maternal morbidity, LOS, fetal depression (due to less narcotic use)
Summary

- The incidence of acute abdominal pain in pregnancy which requires surgery is ~1/500.

- It is important to keep a broad differential diagnosis as signs, symptoms, and investigations can all be altered due to pregnancy.

- Diagnostic imaging is safe in pregnancy.

- Surgical options include laparotomy and laparoscopy.
C'est la gravité de l’urgence digestive abdominale et la rapidité du diagnostic qui déterminent le pronostic maternel et foetal.

La prise en charge des urgences abdominales pendant la grossesse est souvent associée à un retard diagnostique (vomissements, douleurs, etc.) et donc thérapeutique.

Les trois syndromes chirurgicaux principaux sont:
- l’appendicite aiguë,
- la cholécystite aiguë
- un syndrome occlusif.

Ces pathologies, rencontrées pendant la grossesse, doivent être prises en charge par les chirurgiens selon les principes habituels adoptés en dehors de toute grossesse et après concertation avec un gynécologue-obstétricien.
Take home message

POINTS ESSENTIELS (LAPAROSCOPIE)

• L’abord laparoscopique est possible pendant toute la durée de la grossesse mais reste en pratique peu utilisé à partir du deuxième trimestre.

• La technique ouverte (open laparoscopy) est recommandée pour la mise en place des trocarts et la réalisation du pneumopéritoine.

• La position des trocarts opératoires doit tenir compte de la taille et de la hauteur de l’utérus. La pression du pneumopéritoine ne doit pas dépasser 12 mmHg.

• La survenue de modifications hémodynamiques et gazométriques foetales, engendrées par le pneumopéritoine, est théorique mais possible.
Thank-You!