

Ectopic Pregnancy

Background

1. Definition
 - Ectopic pregnancy
 - Any pregnancy that occurs outside the intrauterine cavity
 - Ruptured ectopic pregnancy
 - Pregnancy outside the intrauterine cavity that outgrows the site of implantation and ruptures
 - Heterotopic pregnancy
 - Coexistence of intrauterine and ectopic pregnancies
2. True medical emergency

Pathophysiology

1. **Pathology**
 - Fertilized ovum implants outside of the intrauterine cavity
 - Embryo implants with no decidua formed
 - Trophoblastic cells erode through mucosa & muscularis, destroying tissues, opening blood vessels and producing intratubal hemorrhage
 - Hemorrhage increases size of tubal mass
 - May cause rupture or more commonly slow leakage of blood out through fimbriated end of tube with accumulation in posterior cul-de-sac
 - Common sites of implantation
 - Ampulla: 80%, ruptures at 8-10 wks
 - Isthmus: 15%, ruptures at 6-8 wks
 - Interstitial (corneal): 2.5%, ruptures at 8-16wks, can cause fatal hemorrhage due to involvement of ovarian and uterine vessels
2. **Incidence, prevalence**
 - Rate of ectopic pregnancy in North America climbed from <0.5% (4.5 per 1,000) of all pregnancies in 1970 to 1.97% (20 per 1,000) in 1992
 - Incidence of ectopic pregnancy rupture and fatality rate has declined from 35.5 deaths per 10,000 ectopics in 1970 to 3.8 per 10,000 in 1989
 - Incidence of heterotopic pregnancy 1:30,000 for naturally occurring pregnancies, approx 1:100 with the use of assisted reproductive technologies
3. **Risk factors**
 - PID most important risk factor but frequently absent
 - History of any process affecting fallopian tube
 - Previous ectopic, tubal surgery, infertility
 - In utero DES exposure
 - Genital infections
 - Current smoking
 - Age >35
 - Pregnancy occurring in patient with an IUD in situ or s/p tubal sterilization

4. **Morbidity, mortality**

- Leading cause of 1st trimester maternal death
- Ruptured ectopic pregnancy accounts for 10-15% of all deaths during pregnancy

Diagnostics

1. **History**

- High index of suspicion
 - Female of reproductive age with abdominal pain and vaginal bleeding after amenorrhea for approx 7 wks
 - PID history
 - IUD in situ
 - Previous ectopic or h/o infertility
 - Gynecologic procedures

2. **Physical exam**

- Vital signs
 - Often normal
 - Hypotension suggestive of ruptured ectopic pregnancy
- Cardiovascular
 - Hypotension or hemodynamic instability suspect ruptured ectopic pregnancy
- Abdomen
 - Unremarkable if unruptured
 - Dull & aching
 - Poorly localized
 - If ruptured
 - Significant tenderness
 - Guarding with rebound tenderness
 - Generalized peritonitis
- Pelvic
 - Unremarkable in 10% of patients
 - Normal or slightly enlarged uterus
 - Cervical motion tenderness
 - Adnexal tenderness/ palpable mass
 - Hemoperitoneum / bulging posterior cul-de-sac

3. **Diagnostic testing**

- Laboratory evaluation
 - **Beta HCG**
 - Not to be used as the only test
 - Most helpful in conjunction with ultrasound
 - Urine qualitative
 - Use to diagnose pregnancy
 - Sensitive to 15-50 mIU/mL or 3-4 days post implantation
 - Obtain in women of reproductive age presenting with abdominal pain and/or vaginal bleeding

- Serum quantitative:
 - Should increase by at least 53-66% every 2 days, peaking at >100,000 IU/L
 - Beta-HCG >6500: transabdominal ultrasound should be accurate
 - Beta-HCG >1500: transvaginal ultrasound should be accurate
- **Progesterone**
 - Often not useful clinically
 - <11 ng/mL: suggests abnormal pregnancy, but not all abnormal pregnancies are ectopic
 - >20 ng/mL: viable IUPs, but 2.6% of patients with ectopic pregnancies have progesterone levels >20 ng/mL
- Diagnostic imaging
 - **Ultrasound**
 - Should be part of the initial evaluation (SOR:C)^{3,7}
 - Absence of intrauterine gestational sac with beta- hCG level
 - >2,000 IU/L transvaginal ultrasound
 - >6,500 IU/L transabdominal ultrasound
 - Presumptive ectopic pregnancy (SOR:C)⁷
 - Limitations
 - Based on availability of ultrasound, gestational age and gestational number of pregnancy
- Other testing
 - **Culdocentesis**
 - Consider if ultrasound unavailable or indeterminant
 - 65% of ectopics will have positive test
 - Positive
 - Aspiration of >0.5 mL non-clotting blood
 - 65% nonruptured ectopics have (+) test
 - Negative
 - 0.5-5 mL serous fluid
 - Rules out ruptured ectopic only
 - Indeterminant
 - Dry tap or clotting blood
 - No conclusion can be drawn
 - Contraindicated with
 - Coagulopathy
 - Sharply retroverted uterus
 - Palpable posterior cul-de-sac mass
- **Diagnostic criteria**
 - Pregnancy not located on transvaginal ultrasound scan: obtain quantitative hCG
 - hCG <1,500 IU/L: repeat hCG level in 48 hr
 - hCG >2,000 IU/L: consider diagnostic uterine curettage or surgical
 - Exception: multiple gestations may not be seen until hCG >2,000 IU/L

- Pregnancy located on ultrasound scan
 - IUP on scan: is a threatened miscarriage if patient with pain and/or bleeding, needs re-evaluation in 2-3 days
 - Ectopic cardiac activity, ectopic gestational sac or ectopic mass: treatment of ectopic pregnancy

Differential Diagnoses

1. Miscarriage/threatened spontaneous abortion
2. PID
3. Tubo-ovarian abscess
4. Ruptured corpus luteum cyst
5. Ovarian follicle
6. Urinary calculi
7. Acute appendicitis

Therapeutics

1. **Ruptured ectopic, Pt unstable**
 - ABCs: ensure adequate or circulating volume
 - IV fluids, type and screen of type and cross-match, CBC
 - Emergent laparotomy (SOR:C)⁸
2. **Stable, unruptured ectopic**
 - Methotrexate (SOR:B)^{3,8}
 - Criteria for use
 - No rupture
 - hCG <5,000 IU/L
 - No maternal liver, renal or pulmonary Dz
 - Ectopic mass <3.5 cm with no cardiac activity
 - Methotrexate treated degenerating trophoblast is fragile
 - Careful physical exam only once
 - No ultrasound
 - Monitor with hCG levels
 - Laparoscopy with salpingostomy
 - Preferred surgical method (SOR:A)⁸
 - Expectant management (SOR:C)^{3,8}
 - Criteria (88% resolution)
 - No rupture
 - Initial hCG <200 IU/L
 - Ectopic mass <3 cm
 - Absence of fetal heartbeat
 - Must have close follow-up
 - Methotrexate vs tube-sparing laparoscopy
 - No difference in overall outcomes (SOR:A)³

Follow-Up

1. Medical management
 - hCG levels should begin declining day 4-7 after methotrexate
 - Second dose may be required if hCG decline is <15% between day 4 and 7

- Follow hCG weekly until none detected
- Treatment failure
 - Significantly worsening abdominal pain
 - Increasing hCG level after day 3 of Tx
- 2. Surgical management
 - hCG weekly until no longer detected
 - If hCG levels fail to decline, patient can be treated with methotrexate post-surgery
- 3. Expectant management
 - hCG weekly until no longer detected
 - Rising hCG level post-treatment
 - Surgical intervention necessary

Prognosis

1. Following treatment
 - Success rates with proper patient selection
 - 42-82% expectant mgmt
 - 90% medical mgmt
 - 92% surgical mgmt
2. Future fertility
 - Post-treatment conception rate approx 77% regardless of treatment
3. Risk of recurrence
 - 5-20%
 - 32% if two consecutive ectopic pregnancies

Screening

1. All women of reproductive age with abdominal pain or vaginal bleeding should have the diagnosis of ectopic pregnancy considered and expeditiously ruled out (SOR:B)³

References

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