

Female Pelvic Ultrasound

(1st trimester bleeding and suspected ectopic pregnancy)

Basics

- Goal of 1st trimester ultrasound is to rule in intrauterine pregnancy (IUP)
- Use for 1st trimester bleeding and suspected ectopic pregnancy
- Consider ectopic pregnancy if: no IUP, fertility previous assistance, or significant pain or fluid within pelvis
- Presence of IUP has a negative predictive value for ectopic pregnancy close to 100% (except with fertility drugs)

Relevant Anatomy

- Pouch of Douglas (space between uterus and rectum) is most dependent area of female pelvis
- Uterus is pear-shaped, between bladder and colon
- Majority anteverted (10% retroflexed)
- Ovaries are lateral to body of uterus, anterior and medial to internal iliacs
- Ovaries are usually 2 cm x 3 cm
- Fallopian tubes rarely seen on ultrasound

Technique

- Patient should be supine and draped
- Transabdominal technique should be attempted first
- If no IUP, switch to transvaginal technique

Transabdominal Technique

- Select transabdominal probe
- Probe marker towards patient right for transverse view or patient's head for longitudinal view
- Best performed with full bladder
- Track the vaginal stripe to the cervix
- Track the endometrial stripe through the uterus
- Increase depth so Pouch of Douglas is visible
- Scan through entire uterus (cervix to fundus)

Transvaginal Technique

- Find a chaperone!
- Empty bladder necessary for exam

- Place gel on endocavitary probe, put on protective covering, and apply sterile gel to outside
- Structures closest to probe will be at the top of the screen
- For longitudinal view probe marker is anterior (facing up)
- For transverse view probe marker is towards patient right
- Insert probe along anterior vaginal wall

Ovaries

- Scan in transverse plane
- Usually at the level of the uterus
- Ovarian parenchyma is hypoechoic relative to myometrium
- Ovarian follicles: fluid-filled cystic structures (give ovaries a chocolate chip cookie appearance)
- Follicular cysts: < 1cm
- Luteal cysts: thin wall, unilocular cysts, < 5 cm
- Cysts > 3 cm need follow up

Pregnancy

- IUP confirmed by presence of yolk sac or fetal pole
- Yolk sac: echogenic ring within gestational sac
- Fetal pole: can be echogenic material or fully formed fetus in the gestational sac
- Myometrial mantle around gestational sac should be at least 5 mm thick
- Double decidual sign (DDS): 2 concentric, thick, hyperechoic endometrial rings (results of deformation by implantation)
- Presence of a DDS = beta HCG 1,000 - 2,000

Fetal Heart Rate

- Fetal heart beat can be seen near base of yolk sac (sometimes before fetal pole is visible)
- Measure fetal heart rate is measured in M mode
- Place M mode spike through fetal heart for heart beat tracing

- Use fetal heart rate calculator on machine (you will have to measure distance between heart beats with calipers for this)
- 100 - 180 BPM is normal

Determining Fetal Age

- Can use mean sac diameter calculation or crown-rump length calculator
- MSD calculator uses 3 measurements of sac (2 transverse planes and 1 longitudinal plane) and divides by 3.
- Crown-rump length calculation measures the fetus in the longest axis
- CRL is most accurate in early pregnancy

Pregnancy Pathology

- With miscarriage clot may be seen in the endometrium or cervical canal
- Subchorionic hemorrhage: blood between chorion and myometrium

Ultrasound Signs of Abnormal Gestation

- Absence of yolk sac in presence of mean sac diameter > 10 mm
- Absence of fetal pole or fetal heart beat in presence of mean sac diameter > 18 mm
- Gestational sac appears shaggy
- No fetal heart beat with fetal pole > 5 mm (on transvaginal ultrasound)

Ultrasound Findings in Ectopic Pregnancy

- No UIP
- Adnexal mass
- Products of conception in an adnexal mass
- Adnexal sac with thick wall and color-flow signal (known as the "ring of fire")
- Gestational sac in cervix without myometrial mantle ≥ 5 mm