What’s going on in the Uterus?
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No conflicts to disclose
Objectives

- Normal uterine findings
- Fibroids
- Polyps
- Saline Infusion Sonography
- Clinical correlation
Keeping oriented
Indications for U/S

- Abnormal bleeding
- Enlarged uterus
- Pelvic pain
- Abnormal bimanual exam
Uterus

- Position
- Overall size
- Examine cervix to fundus
- Measure endometrial thickness
Uterine Positions
Uterus - Sagittal
Uterus - Sagittal fundus
Uterus - Coronal
Nabothian Cyst

- Endocervical gland
- Filled with mucus
- Benign
Cervix - Nabothian cyst
20 yo 1 month s/p c/s at 27 weeks with persistent bleeding
37 yo G3P3 s/p C/S X 3, bleeding
Bicornuate uterus
Fibroids - Leiomyomata Uteri

- Most common uterine neoplasm
- Clinically seen in 20-30% of women over age 30
- Found in up to 75% of hysterectomy specimens
**Fibroids**

- Smooth muscle cell tumors
- Benign
- Location
  - Intramural
  - Subserosal
  - Submucosal
Fibroids

- Spherical
- Pedunculated
- Cystic degeneration
- Calcification causes shadowing
Intramural fibroid
Submucosal fibroid
Submucosal & subserosal fibroid
Subserosal fibroid
Calcified fibroid
Which type of fibroids cause abnormal bleeding?

- Submucosal
- Intramural
- Subserosal
- All of the above
- None of the above
Endometrium - Cyclic changes

- Basalis layer unchanged throughout cycle
- Functionalis layer
  - Glands determine the echogenic pattern
  - Proliferative phase - hypoechoic due to narrow glands and a low gland to stroma ratio
  - Secretory phase - hyperechoic due to increased glandular volume
EM Stripe - Proliferative

- Trilaminar
  - Basalis layer defines interface between endometrium and myometrium
  - Functionalis - glands are hypoechoic
  - Bright specular reflection - smooth luminal surfaces
EM Stripe - Secretory

- Glands become tortuous and occupy more volume
- No longer trilaminar
EM Stripe - Measurement

- Thickest site
- Both walls, excluding intracavitary fluid
- Basalis to basalis
- Expect <5 mm in:
  - Post-menopausal
  - OCP’s or Depo-Provera
  - GnRH agonist >3 weeks
EM Stripe - post menstrual
EM Stripe - mid proliferative
EM Stripe - late proliferative
EM Stripe - secretory
Tamoxifen

- Anti-estrogen in breast
- Estrogen agonist in endometrium
- Heterogeneous uterine changes
- Up to 6-8 mm endometrium normal
- SIS shows proximal myometrial changes

Goldstein, 1996
6 days post endometrial biopsy
Endometrium

- 45 yo P1 with scant bleeding and no menses for prior 6 months, unable to biopsy
Endometrium coronal
Endometrial Polyps

- Localized hyperplastic overgrowth of the endometrial glands and stroma

- Rarely neoplastic
  - 509 women with endometrial polyps
  - Benign: 70%
  - Hyperplasia without atypia: 26%
  - Hyperplasia with atypia: 3%
  - Cancer: 0.8%

Endometrial Polyps

- Incidence peaks in 5th decade of life
- Responsible for ¼ of cases of AUB
- Metrorrhagia: most frequent symptom
- Diagnosis:
  - Endometrial Biopsy
  - TVUS
  - SIS
  - Hysteroscopy
Endometrial Polyps

- 106 women with menometrorrhagia s/p TVUS, SIS and Hysteroscopy with biopsy
- SIS more accurate than TVUS in diagnosing endometrial polyps
  - Higher Sensitivity: 93% vs 65%
  - Higher Specificity: 94% vs 76%

Thickened Endometrium
After SIS: Multiple Polyps

Williams, P. L. et al. Radiographics 2003;23:703-718
Endometrial Polyps

- Improve TVUS diagnosis:
  - “Bright Edge of Endometrial Polyp”
  - Hyperechoic line between the myometrium and thickened endometrium
  - Probe must be perpendicular to the polyp
  - Sensitivity 96%, Specificity 82%
Hyperechoic Line Consistent with Polyp

Baldwin, M. T. et al. Radiographics 1999;19:927-935
Endometrial Polyps

- Improve TVUS Diagnosis:
  - Feeding Blood Vessel
    - Doppler shows single blood vessel feeding the polyp
  - Specific but not very sensitive finding
Polyp: Feeding Vessel

Endometrial Polyps

- No imaging modality can distinguish benign from malignant polyps reliably
  - No correlation between resistance to blood flow and final histology
  - No correlation between size of polyp and final histology
  - No correlation between the presence or absence of AUB and final histology

Endometrial Polyps

- No data from randomized trials to guide therapy for asymptomatic polyps
  - Remove polyps of any size in asymptomatic patients with risk factors
    - Postmenopausal
    - Family or personal Hx of ovarian, breast, colon or endometrial cancer
    - Tamoxifen use
    - Obesity
    - Chronic anovulation
    - Estrogen therapy
    - Prior endometrial hyperplasia
Endometrial Polyps

- Remove polyps in asymptomatic patients without risk factors:
  - Multiple polyps present
  - Single polyp >2 cm in premenopausal women
  - Single polyp >1 cm in postmenopausal women
Saline Infusion Sonography

- SIS
- Hydrosonography
- Saline hysterography
- Hydrohysterography
- Sonohysterography
**SIS**

- **Indications**
  - Abnormal bleeding
  - Abnormality seen on gyn U/S
  - Infertility
  - Congenital anomalies
  - Suspected intrauterine synechiae
SIS

- Contraindications
  - Pregnancy
  - Pelvic infection
**SIS Procedure**

- Real time gyn U/S
- Place speculum
- Prep cervix
- Draw up saline (20 cc)
- Flush catheter (Soules IUI catheter)
**SIS Procedure**

- Insert catheter
- +/- Remove speculum
- Insert transducer
- Infuse ~5 cc sterile saline slowly
- Obtain images in at least 2 planes
SIS - Case history

- 45 yo G1P1 with menorrhagia unresponsive to medical management.
SIS

- Polyp - sagittal view
SIS

- Polyp - coronal view
Hysteroscopic view
SIS - Case history

- 36 yo G0 with menorrhagia and infertility.
SIS - Gyn U/S
SIS

- Submucosal fibroid
SIS - Gyn U/S

- 27 yo G0 on OCP’s for 6 years, now presents with metrorrhagia.
SIS Submucosal fibroid
Hysteroscopy submucosal fibroid
Cole and Caden
37 yo G3P3 s/p C/S X 3, bleeding
SIS Three prior C/S
24 yo s/p PPROM and delivery at 17 weeks two weeks ago, now with pelvic pain
24 yo s/p PPROM and delivery
Essure
17 yo with uterine anomaly
Three dimensional ultrasound
Three dimensional ultrasound
Summary

- Fibroids often cause acoustic shadowing.
- SIS is useful in the evaluation of abnormal bleeding.
- SIS is more accurate than TVUS alone in the diagnosis of endometrial polyps.
- Three dimensional ultrasound may be used in evaluating uterine anomalies.
Questions?