Objectives

- Associate endometrial carcinoma with its risk factors, imaging appearance, and prognosis
- Distinguish the difference between a liomyoma and leiomyosarcoma
- Identify fallopian tube carcinoma risk factors, imaging characteristics, and long-term prognosis
- List the disease process and imaging characteristics for cervical carcinoma
- Summarize the genetic makeup of Persistent trophoblastic neoplasia

Endometrial Carcinoma

- Most common gynecologic cancer in USA
- Best prognosis with early diagnosis
- Risk factors
  - Obesity
  - Nulliparity
  - Late menopause
  - Adenomatous polyps
  - Family history
  - Unopposed estrogen

Endometrial Carcinoma

- Predisposing factors
  - Hereditary nonpolyposis colon cancer (HNPCC)
  - Breast cancer
    - Tamoxafin treatment
- Decreased risk
  - Oral contraceptives
  - Smoking

Endometrial Carcinoma

- Histology
  - 80% endometrioid type
- Typing
  - Type 1 due to long term estrogen therapy
  - Type 2 due to atrophic endometrium
- Ovarian carcinoma association
Endometrial Carcinoma-Classification

Endometrial Carcinoma-Clinical Diagnosis
- Occurs in 6th – 7th decade of life
- Clinical presentation
  - Bleeding
  - Pain
  - Uterine distention

Endometrial Carcinoma-Diagnostic Features
- Endovaginal imaging
  - Endometrial
    - Thickness
    - Texture

Endometrial Carcinoma-Treatment
- Total hysterectomy
  - Uterus
  - Ovaries
  - Tubes
- Lymphadenectomy with higher grade cancer
- Radiation and chemotherapy
Endometrial Carcinoma-Diagnostic Features

- Stage I or II
  - Confined to the uterus

- Stage III or IV
  - Extends beyond the uterus
  - Bladder/rectum infiltration
  - Adjacent mass
  - Ureteral obstruction

Endometrial Carcinoma-Doppler

- No flow
  - Normal
  - Atrophic
  - Hyperplastic
- Increased flow in cancerous lesion
  - RI = 0.42±0.20

Endometrial Carcinoma-Staging

- Stage I or II
  - Confined to the uterus

- Stage III or IV
  - Extends beyond the uterus
  - Bladder/rectum infiltration
  - Adjacent mass
  - Ureteral obstruction
Endometrial Carcinoma-Technique

- Endometrial thickness measurement
- Endometrial volume
- Power Doppler
- Diagnosis criteria
  - Subendometrial halo irregularity
  - Fluid
  - Vessel architecture
  - Vessel branching pattern

Endometrial Carcinoma-Technique cont.

- Uterine and cervix echogenicity
- Ascites
- Suspected neoplasm image
  - Liver
  - Abdominal viscera
  - Kidneys
  - Para aortic/caval adenopathy

Endometrial Carcinoma-Other Imaging

- MRI/CT
  - Lymphadenopathy
  - Metastatic disease (Stage III and IV)

Endometrial Carcinoma-Differential Diagnosis

- Endometrial hyperplasia
- Endometrial polyps
- Leiomyoma
- Cervical cancer

Leiomyosarcoma

Epidemiology

- Smooth muscle origin
- 3% of uterine tumors
- Metastasis common

Risk Factors

- Nulliparity
- 50 years and older
- Obesity
- Pelvic radiation
- Tamoxifen exposure
**Leiomyosarcoma—Pathophysiology**
- Usually intramural
- Gross appearance
  - Fleshy
  - Hemorrhagic/necrotic
  - Infiltrative borders

**Leiomyosarcoma—Clinical Diagnosis**
- Vaginal bleeding
- Pelvis and/or abdominal pain
- Rapidly increasing size
- Needle biopsy
- MRI

**Leiomyosarcoma—Treatment**
- Total hysterectomy
- Peritoneal washings
- Nodule sampling
- Radiotherapy

**Leiomyosarcoma—Diagnostic Features**
- Sonography
  - Rapid growing heterogeneous mass
  - Acoustic enhancement
  - Increased intratumoral flow

**Leiomyosarcoma—Sonographic Technique**
- Abdominal and vaginal imaging
- Study
  - Uterine echo texture
  - Adnexal masses
  - Free fluid
  - Para-aortic/caval area for adenopathy

**Leiomyosarcoma—Other Imaging**
- MRI/CT
  - Tumor numbers in uterus
  - Location
- FDG-PET
  - Differentiate masses from cancer
Leiomyosarcoma-Differential

- Other uterine sarcoma
- Endometrial adenocarcinoma
- Adenomyomas
- Gastrointestinal carcinoma
- Bladder carcinoma

Fallopian Tube Carcinoma

**Epidemiology**
- Less than 1% of gynecologic cancers
- Aggressive tumor
- Occurs in 6th decade

**Risk Factors**
- Infertility
- Nulliparity
- Low parity
- Pelvic inflammatory disease (PID)
- Family history of ovarian cancer

Fallopian Tube Carcinoma - Pathophysiology

- Most common histology
- Adenocarcinoma
- Elevated CA125
  - Remember, this is nonspecific
  - Other causes include
    - Myomas
    - Endometriosis
    - Pregnancy
    - PID

Fallopian Tube Carcinoma - Clinical Diagnosis

- Asymptomatic to abdominal pain
- Increased abdominal girth
- Vaginal bleeding
- Palpable pelvic mass
- Hydrops tubae profluens
  - Profuse watery discharge

Fallopian Tube Carcinoma - Treatment

- Total hysterectomy
- Peritoneal biopsy
- Lymph node sampling
- Radiation/chemotherapy
Fallopian Tube Carcinoma-Sonographic Imaging
- Vaginal imaging
- Solid or cystic adnexal mass
- Adnexal mass
  - Ill-defined
  - Sausage-shaped
- Hydrosalpinx

Fallopian Tube Carcinoma-Sonographic Technique
- Vaginal imaging
- Pelvic neoplasm suspected also image
  - Renals
  - Liver
  - Abdominal viscera

Fallopian Tube Carcinoma-Other Modalities
- CT
  - Images metastasis

Fallopian Tube Carcinoma-Differentials
- Ovarian carcinoma
- Myoma
- PID
- Other adnexal masses

Carcinoma of the Cervix-Epidemiology
- Second most common gynecologic malignancy
- Occurs in 3rd – 4th decade of life
Carcinoma of the Cervix - Risk Factors

- Human papilloma virus (HPV) infection
- Early sexual activity
- Multiple partners
- Low socioeconomic status
- Smoking
- Oral contraceptives
- Weak immune system
- Geography
- Diethylstilbestrol (DES) exposure

Carcinoma of the Cervix - Pathophysiology

Carcinoma of the Cervix - Clinical Diagnosis

- Symptoms
  - Abnormal vaginal discharge
  - Post-coital bleeding
  - Bladder irritability
  - Low back pain
  - Uretral obstruction

Carcinoma of the Cervix - Treatment

- Cone biopsy to preserve fertility
- Radiotherapy
- Extra cervical spread
  - Surgery
  - Radiotherapy/chemotherapy
Carcinoma of the Cervix - Prevention

- The American Cancer Society recommends Gardasil.
- Given to pre-pubescent and adolescent females before they become sexually active.
- 70% reduction of cervical carcinoma expected.

Carcinoma of the Cervix - Sonographic Imaging

- Stage I and II
  - Normal size/echogenicity
  - Hematometra due to cervical stenosis
- Stage III and IV
  - Bulky cervix
  - Bladder invasion
  - Hydronephrosis
  - Liver metastasis
  - Node formation around aorta and inferior vena cava (IVC)
Carcinoma of the Cervix-Technique

- Imaging
  - Translabial
  - Transperitoneal
  - Endovaginal
- Check for
  - Hydronephrosis
  - Retroperitoneal nodes
  - Liver metastasis

Carcinoma of the Cervix-Other Modalities

- CT
- MRI
  - Early Stage
  - Stages
    - II
    - III
    - IV

Carcinoma of the Cervix-Differentials

- Lower uterine segment leiomyoma
- Benign endometrial polyp
- Endometrial cancer

GESTATIONAL TROPHOBLASTIC NEOPLASIA-Epidemiology

- Complication of pregnancy
- Include;
  - Benign hydatidiform mole
  - Invasive mole
  - Choriocarcinoma
  - Placental-site trophoblastic tumor (PSTT)
GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Invasive Mole
  - Contains chorionic villi
  - Elevated hCG
  - Persistent heavy bleeding
  - Focal invasion

- Choriocarcinoma
  - Absence of chorionic villi
  - Occurs after
    - Complete or partial mole
    - Normal pregnancy
    - Still birth
    - Spontaneous abortion
    - Ectopic pregnancy

- Placental-site Trophoblastic Tumor (PSTT)
  - Arises from nonvillus trophoblast
  - Mild elevation of hCG
  - Presents months to years after term delivery
  - Infiltrates
    - Ovary
    - Parametrium
    - Rectum and/or bladder

- Epithelioid Trophoblastic Tumor
  - Rarest variant of PSTT
  - Presents 6-7 years after term pregnancy

- Affects on the Ovary
  - Theca-lutein cysts
  - Seen in 25% of cases
  - Increases risk of postmolar trophoblastic disease

- Clinical Diagnosis of invasive mole
  - Evacuation of hydatidiform mole
  - Elevated $\beta$-hCG titers
  - Persistent vaginal bleeding

- Symptoms
  - Cough
  - Hemoptysis
  - Neurologic disturbances or hemorrhage
GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Treatment
  - Methotrexate with or without folinic acid
  - Multidrug chemotherapy

GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Sonographic appearance of invasive mole
  - Focal areas of increased echogenicity

GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Sonographic appearance of choriocarcinoma
  - Focal, hemorrhagic nodule within endometrium
  - Secondary masses to cervix or vagina
  - Metastasis to liver

GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Sonographic features of Placental-site Trophoblastic Tumor (PSTT)
  - No specific distinguishing features
  - Irregular uterine mass
  - Patient history
  - Marked hypervascularity
  - Chaotic color flow pattern

GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Other imaging modalities
  - CT
  - MRI
GESTATIONAL TROPHOBLASTIC NEOPLASIA

- Differential diagnosis
  - Incomplete abortion
  - Hydropic degeneration of the placenta
  - Dermoids
  - Adenomyosis
  - Ovarian tumors
  - Cystic papillary adenomas