



NOTES

OVARIAN & UTERINE DISORDERS

GENERALLY, WHAT ARE THEY?

PATHOLOGY & CAUSES

- Gynecological disorders; adversely affect reproductive function

SIGNS & SYMPTOMS

- Pelvic pain
 - Focal/diffuse
- Disorder-specific

DIAGNOSIS

DIAGNOSTIC IMAGING

Ultrasound, MRI

- See individual disorders

OTHER DIAGNOSTICS

- Obstetric, gynecologic history
- Physical examination

TREATMENT

- Considerations: desire to preserve fertility, menopausal/post-menopausal status, presence of malignancy

MEDICATIONS

- Disorder-specific
 - Hormonal

SURGERY

- Disorder-specific

ENDOMETRIOSIS

osms.it/endometriosis

PATHOLOGY & CAUSES

- Inflammatory disorder characterized by **ectopic endometrial-like tissue** (endometrial **glands, stroma**) implantation, growth outside uterus
- Benign disorder with invasive, disseminating malignancy characteristics
 - May regress during menopause

Common locations

- **Ovaries** (most common); referred to as **endometrioma**/"chocolate cyst"

- Anterior/posterior cul-de-sac; fallopian tubes; posterior broad, round, uterosacral ligaments
- May also implant in non-reproductive sites (bowel, bladder, diaphragm, thorax, brain, skin)

CAUSES

- Implantation cause unclear
 - Multifactorial process involves immune, endocrine, cellular, genetic factors

- Current theories
 - **Metastatic theory:** lymphatic/hematogenous spread, iatrogenic implantation, retrograde menstruation
 - **Metaplastic theory:** metaplastic Müllerian remnants changes
 - **Induction theory:** undifferentiated mesenchyme stimulated to form endometriotic tissue

TYPES

Pelvic

- Endometrial tissue within pelvic cavity
 - Peritoneum, pelvic organs/rectouterine pouch

Ovarian

- Ovarian cyst lined with endometrial tissue

Deeply infiltrating endometriosis

- Endometrial tissue extension ≥ 5 mm into retroperitoneal space; may exist in several regions

RISK FACTORS

- Nulliparity
- Prolonged endogenous, physiologic estrogen exposure
 - Early menarche/late menopause, short menstrual cycles
- Menstrual flow obstruction
- In utero diethylstilbestrol (DES) exposure
- ↓ body mass index (BMI)
- ↑ dietary trans-fats
- Nucleotide polymorphisms (e.g. rs10965235 in CDKN2BAS gene at locus 9p21.3)
- Age
 - Peak incidence: 25–29 years old

COMPLICATIONS

- Infertility
- Chronic pain
- Endometrioma
 - ↑ ovarian rupture/perforation/torsion risk
- Pneumothorax, hemothorax (thoracic endometriosis)
- ↑ epithelial ovarian cancer (EOC) risk

SIGNS & SYMPTOMS

- May be asymptomatic
- Symptoms often related to implantation site
 - **Gynecological:** dysmenorrhea, pelvic pain, dyspareunia, menorrhagia
 - **Bowel:** constipation, hematochezia, obstruction
 - **Bladder:** pain, dysuria, hematuria
 - **Thoracic:** hemoptysis, bronchospasm

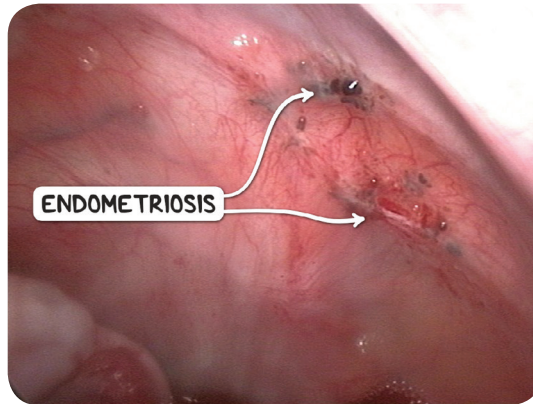


Figure 129.1 An intraoperative photograph of a focus of endometriosis in the parietal peritoneum.

DIAGNOSIS

DIAGNOSTIC IMAGING

Ultrasound

- Abdominal/transvaginal ultrasonography (TVUS)
- Endometrioma
 - Visualization of homogeneous hypoechoic ovarian cyst containing diffuse low-level internal echoes ("ground-glass" echogenicity)
- Lesions found elsewhere
 - Hypoechoic lesions, retroperitoneal tissue thickening; severe endometriosis may demonstrate "kissing ovaries" (ovaries joined behind rectouterine pouch)

MRI

- If ultrasound findings inconclusive
- Hemorrhagic “powder burn” areas appear bright on T1
- Solid deep lesions
 - T1 hyperintense, T2 hypointense
- Fibrotic adhesions
 - Isointense to pelvic muscle on both T1, T2

Laparoscopy

- Ectopic endometrial tissue identification
 - Irregularly-shaped reddish/reddish-blue lesions
 - Whitish opacifications; occasional hemorrhagic blue-brown areas (“powder burns”)
 - Nodules, cysts may be present
 - Fibrous adhesions (severe disease)

OTHER DIAGNOSTICS

- Pelvic exam
 - Limited motion of ovaries, uterus (fixed uterus)
 - Adnexal mass palpated; may be tender
 - Nodules in posterior fornix

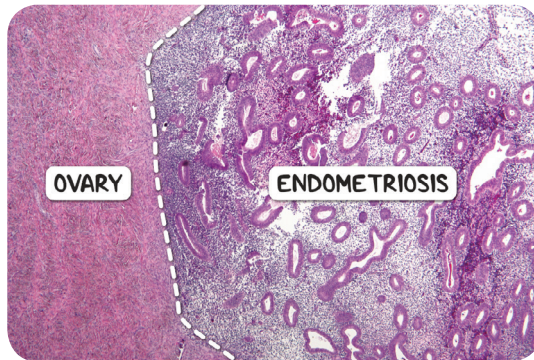


Figure 129.2 The histological appearance of endometriosis affecting the ovary. Ovarian stroma is seen on the left and an endometrial deposit on the right.

TREATMENT

- No definitive treatment; management options depend on desire to preserve fertility

MEDICATIONS

- Combined norgestimate–ethinyl estradiol cyclic/**continuous oral contraceptives**
 - ↓ dysmenorrhea, ↓ endometrioma volume
- Gonadotropin-hormone releasing (**GnRH**) **antagonists**
 - Pituitary gonadotropin hormone suppressed → ↓ estrogen
- Pain management
 - Nonsteroidal anti-inflammatory drugs (**NSAIDs**)

SURGERY

- **Laparoscopic** ectopic endometrial tissue **removal**
- Hysterectomy

OVARIAN CYST

osms.it/ovarian-cyst

PATHOLOGY & CAUSES

- Fluid-filled growth that develops in/on ovary
 - Usually benign (occasionally malignant)
- Majority of cysts occur during reproductive years
- Size
 - 1–10cm/0.4–3.9in
- Strenuous physical activity/sexual intercourse → rupture
 - Contain components that irritate peritoneal cavity upon rupture (cystic serous/mucinous fluid/blood; sebaceous fluid, hair, fat, bone, cartilage from dermoid cysts)

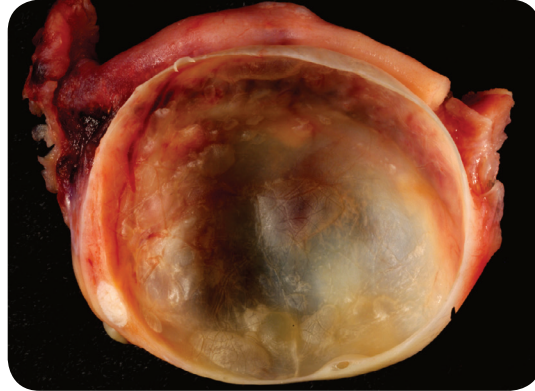


Figure 129.3 The gross pathological appearance of a large, benign ovarian cyst. The internal lining of the cyst is smooth and would have contained serous fluid prior to opening.

TYPES

Functional/physiologic

- Abnormally large ovarian components
 - Follicular cyst
 - Corpus luteum cyst
 - Theca-lutein cyst (usually bilateral)

Neoplastic

- Benign/malignant
 - Polycystic ovaries
 - Endometrioma
 - Serous cystadenoma
 - Mucinous cystadenoma
 - Dermoid cyst (benign cystic teratoma)

RISK FACTORS

- Early menarche, obesity, infertility, fertility treatments, polycystic ovarian syndrome, hypothyroidism, hyperandrogenism, tamoxifen use, smoking (mucinous cysts)

COMPLICATIONS

- Rupture, hemorrhage, ovarian torsion

SIGNS & SYMPTOMS

- May be asymptomatic
- **Pelvic pain**/lower abdominal pressure sensation
- **Dyspareunia**

Ruptured cyst

- Sudden severe, sharp pain onset
- Pain may be referred to shoulder/upper abdomen (due to subphrenic blood extravasation)
- Rebound tenderness/guarding may be present (due to peritoneal irritation)

Hemorrhage

- Hemodynamic instability signs (e.g. hypotension, tachycardia)

DIAGNOSIS

DIAGNOSTIC IMAGING

Ultrasound

- TVUS/abdominal
- Provides mass characterization
 - Generally round/oval anechoic mass; smooth, thin walls
 - Different mass types have unique characteristics

MRI

- If ultrasound indeterminate for surgical resection evaluation

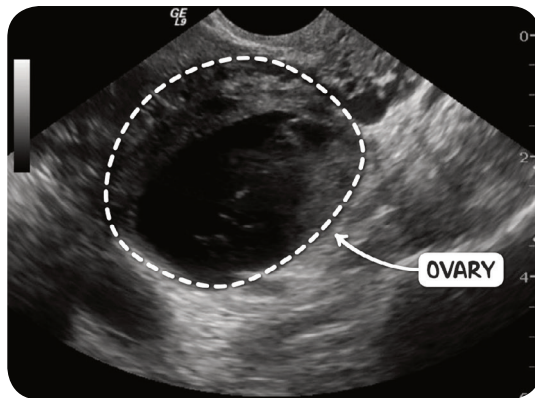


Figure 129.4 An ultrasound scan of the pelvis in an individual with a hemorrhagic ovarian cyst. The ovary (outlined) contains a large hypoechoic area which has displaced most of the ovarian parenchyma.

LAB RESULTS

- Serum CA-125 (in menopausal, postmenopausal individuals)
 - Assists in ruling out ovarian cancer

Histopathological examination

- Ultrasound-guided aspiration
- Histology varies widely, depending on type (e.g. benign mucinous tumor—single layer of columnar epithelial cells with mucinous cytoplasm)

OTHER DIAGNOSTICS

- Obstetric, gynecologic history

Pelvic examination

- Adnexal tenderness/palpable mass
- Usually unilateral, localized

TREATMENT

- Functional/physiologic cysts usually resolve spontaneously

MEDICATIONS

- Uncomplicated cyst rupture (hemodynamically stable)
 - Pain management (e.g. NSAIDs)

SURGERY

Laparoscopy/laparotomy

- Ongoing hemorrhage, hemodynamic instability, torsion/rupture risk
- Ovarian cystectomy
 - Removal of abnormal tissue only
- Unilateral/bilateral oophorectomy
 - Removal of entire ovary(ies); recommended for menopausal/postmenopausal individuals, if malignancy confirmed

OTHER INTERVENTIONS

- Significant blood loss
 - *Inpatient care:* fluid replacement; monitor complete blood count (CBC)
- Uncomplicated cyst rupture (hemodynamically stable)
 - Expectant management

OVARIAN TORSION

osms.it/ovarian-torsion

PATHOLOGY & CAUSES

- Gynecological emergency caused by rotation of ovary on its vascular pedicle
 - If the fallopian tube twists with the ovary, adnexal torsion occurs
- Blood supply from ovarian artery, uterine artery's ovarian branch pass through mesovarium (suspends ovary between ovarian, suspensory ligaments) → ovarian torsion cuts off ovary's blood supply → ischemia, infarction, hemorrhage, adnexal necrosis
 - Venous, lymphatic drainage also impeded → ovarian edema

RISK FACTORS

- **Ovarian enlargement** (e.g. tumor, cyst)
 - ↑ if > 5cm/2in, though can occur with normal ovary
- Strenuous exercise
- Sudden ↑ abdominal pressure
- Pregnancy
- Ovulation induction/hyperstimulation (infertility treatment)
- Most cases occur during reproductive years

COMPLICATIONS

- Ovarian necrosis, peritonitis, pelvic adhesion formation, hemorrhage

SIGNS & SYMPTOMS

- **Pelvic pain**
 - Unilateral, severe, sharp
- Nausea/vomiting
- Fever, ↑ heart rate (HR), ↑ blood pressure (BP) may indicate necrosis

DIAGNOSIS

DIAGNOSTIC IMAGING

Pelvic ultrasound

- Enlarged, edematous ovary; displaced follicles appear as "string of pearls"
- Ovary may be located anterior to uterus (rather than lateral)

Doppler imaging

- ↓ blood flow to ovary
- "Whirlpool" sign
 - Indicates coiled ovarian vessels
 - Hypoechoic stripes indicate vascular pedicle twisting

MRI

- If ultrasound equivocal
- Enlarged, edematous ovary, abnormal location; "whirlpool" sign

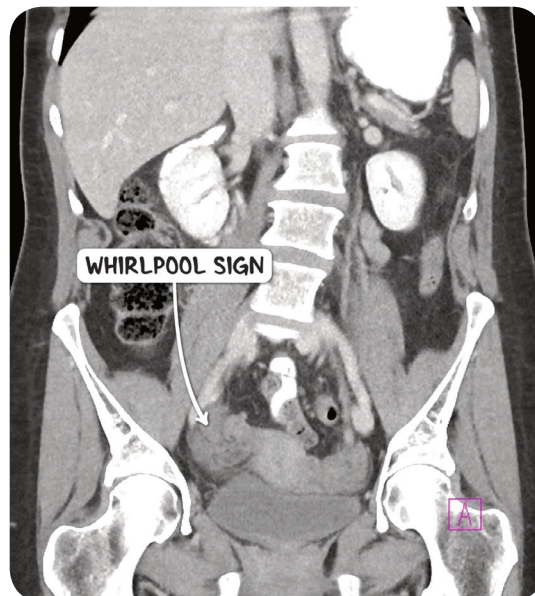


Figure 129.5 A CT scan of the abdomen and pelvis in the coronal plane demonstrating whirlpool sign in an individual with torsion of the right ovary.

OTHER DIAGNOSTICS

- Obstetric, gynecologic history

Physical examination

- Tender adnexal mass may be palpated
- Necrosis present → guarding, rebound tenderness

TREATMENT

SURGERY

- Ovarian benign mass cystectomy

Laparoscopic surgery

- Confirm torsion (direct visualization) → perform detorsion
- Determine ovary's viability
 - Preserve viable ovary (may be edematous/hemorrhagic) for premenopausal individuals
 - Salpingo-oophorectomy (necrotic ovary) for postmenopausal individuals/suspected malignancy

UTERINE FIBROID

osms.it/uterine-fibroid

PATHOLOGY & CAUSES

- Most common benign pelvic neoplasm in reproductive-age individuals
 - AKA leiomyoma/myoma
- Arises from myometrial smooth muscle cells → forms firm, round smooth muscle, connective tissue tumors
- **Hormone fluctuation sensitive:** ↑ cyclically during menses; ↓ after menopause

TYPES

- International Federation of Gynecology and Obstetrics (FIGO) classification

Intramural myoma

- FIGO type: 3, 4, 5
- Found within uterine wall

Submucosal myoma

- Arise from cells just below endometrium, extend into uterine cavity
- FIGO type: 0, 1, 2
 - **Type 0:** completely within endometrial cavity
 - **Type 1:** extend < 50% into myometrium
 - **Type 2:** extend ≥ 50% within myometrium

Subserosal myoma

- FIGO: type 6, 7
- Arise from serosal surface
- Pedunculated
- Growth may be intraligamentary (between broad ligament folds)

Cervical myoma

- FIGO: type 8
- Arise from cervix

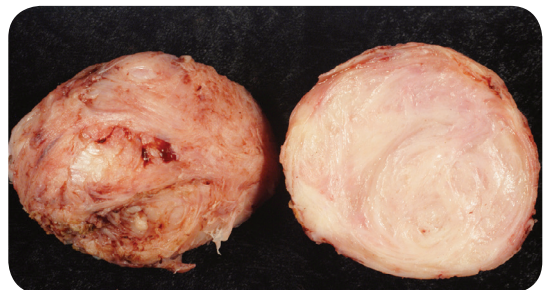


Figure 129.6 The gross pathological appearance of a uterine fibroid. The specimen has been bisected revealing a firm, whorled cut surface.

RISK FACTORS

- Family history
- Nulliparity
- Early menarche
- Prenatal exposure to diethylstilbestrol (DES)
- ↑ (body mass index) BMI
- Environmental exposures
 - Phthalates, polychlorinated biphenyl, bisphenol A
- Dietary factors
 - Insufficient vitamin D
 - Significant red meat consumption
 - Alcohol (especially beer)
- Hypertension history
- Physical/sexual abuse history
- ↑ risk in biologically-female individuals of African descent

COMPLICATIONS

- Surrounding structure pressure
 - Constipation, urinary retention/frequency
- ↑ bleeding → anemia
- Pedunculated fibroid torsion (surgical emergency)

SIGNS & SYMPTOMS

- Often asymptomatic
- Enlarged/distorted uterus
- Abnormal uterine bleeding (e.g. longer/heavier periods)
- Pelvic pain/pressure
- Dysmenorrhea
- Dyspareunia

DIAGNOSIS

DIAGNOSTIC IMAGING

MRI

- Determines specific fibroid type (e.g. intramural)

Transvaginal ultrasound

- Visualize fibroids

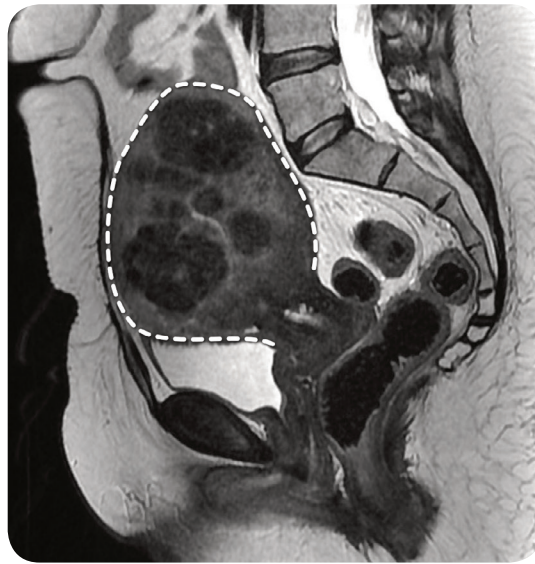


Figure 129.7 An MRI scan of the pelvis in the sagittal plane. The uterine corpus is outlined. The many hypodense objects within it are uterine fibroids.

OTHER DIAGNOSTICS

Physical examination

- Pelvic exam
 - Lumpy, cobblestone uterus upon palpation

TREATMENT

- Depends on symptomatology degree
 - Whether/not fertility preservation desired, menopausal status

MEDICATIONS

- GnRH agonists
- Endometrial atrophy inducement
 - Oral estrogen-progestin contraceptives
- Menstruation suppression (medroxyprogesterone)
- Pain management (NSAIDs)

SURGERY

- Myomectomy (recurrence possible)
- Hysterectomy

- Endometrial ablation
- Laparoscopic myolysis
 - Thermal, radiofrequency, cryoablation

OTHER INTERVENTIONS

- *Mild* cases: expectant management
 - Annual pelvic exams
- Interventional radiology
 - Uterine artery embolization

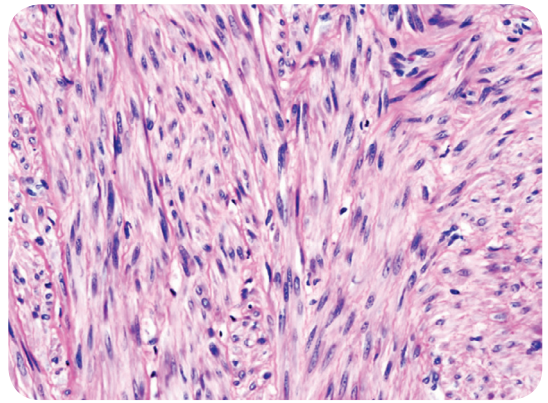


Figure 129.8 The histological appearance of a uterine leiomyoma. The tumor is composed of bundles of spindled smooth muscle cells with no atypia.