

Pelvic Masses

Introduction

Pelvic masses are a common gynecological health issue and may be found in women of all ages.

An estimated 10% of women will undergo surgery for a mass in their lifetime.

They may be associated with symptoms that affect the quality of life or fertility.

Despite their high prevalence, less than 20% of newly discovered pelvic masses will be malignant.

The principal goals when evaluating a pelvic mass is to determine whether:

- ❖ The mass is benign or malignant.
- ❖ There's an urgent condition that requires immediate medical or surgical intervention (ex: Ectopic pregnancy or ovarian torsion).

Differential Diagnosis

1) Gynecological:

- **Pregnancy-related:** Normal intrauterine pregnancy, ectopic pregnancy or molar pregnancy.
- **Uterine:** Fibroids, adenomyosis, advanced uterine carcinoma/ sarcoma or hematometra/ pyometra.
- **Adnexal:**
 - Ovarian(most common): Tumor, cyst or cyst accidents (rupture, hemorrhage and torsion).
 - Tubal: Hydrosalpinx/ pyosalpinx, tubo-ovarian abscess or advanced tubal cancer.

Differential Diagnosis

2) Non-gynecological:

- **Benign:** Appendiceal abscess, diverticular abscess, pelvic kidney, urinary retention, bladder diverticulum and lymphadenopathy.
- **Malignant:** Colorectal carcinoma, retroperitoneal sarcoma, Hodgkin and non-Hodgkin lymphoma.

Ovarian masses

Benign:

- Functional: follicular cysts, corpus luteal cysts, theca luteal cysts
- Endometriomas
- Serous cystadenoma
- Mucinous cystadenoma
- Mature Teratoma

Malignant:

- . Primary: germ cell tumor, epithelial carcinoma, sex-cord tumor
- . Secondary: predominantly breast and gastrointestinal carcinoma

Presentation:

- 1) Asymptomatic (Incidental finding on routine ultrasound)
- 2) Pain
- 3) Pressure symptoms: bloating, urinary frequency, bowel symptoms
- 4) Symptoms of endometriosis: dysmenorrhea, dyspareunia, infertility
- 5) Sinister features (malignant cyst features): weight loss, bloating, urinary frequency, ascites

Investigations:

1) **Pelvic US:** most effective way of evaluating an ovarian cyst
(Transvaginal US is preferable due to its increased sensitivity over transabdominal US)

2) **MRI:** for large cysts (>7cm)

3) **Tumor markers:**

- Lactatedehydrogenase(LDH), α -FP and bhCG:

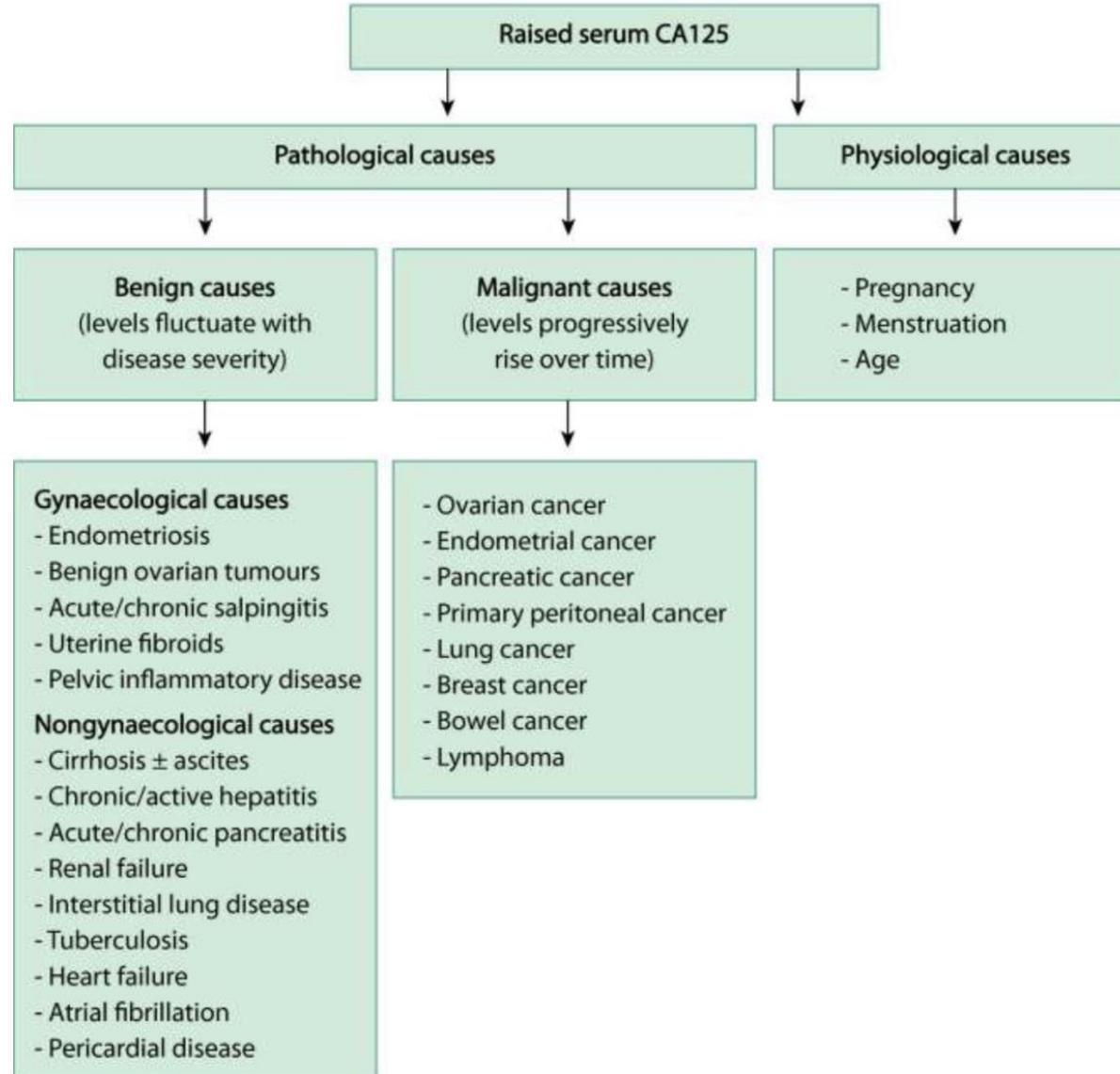
(should be measured in all women under age 45 with a COMPLEX ovarian mass because of the possibility of germ cell tumors)

- CA-125:

. CA-125 is primarily a marker for epithelial ovarian carcinoma and is only raised in 50% of early stage disease

. not highly specific nor sensitive

(CA-125 may be raised in numerous conditions including fibroids, endometriosis, adenomyosis, pelvic infection, pregnancy, menstruation)



How to differentiate between simple and complex cyst?

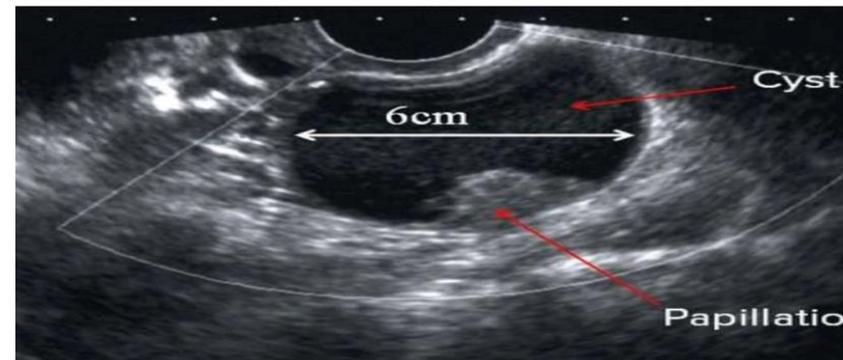
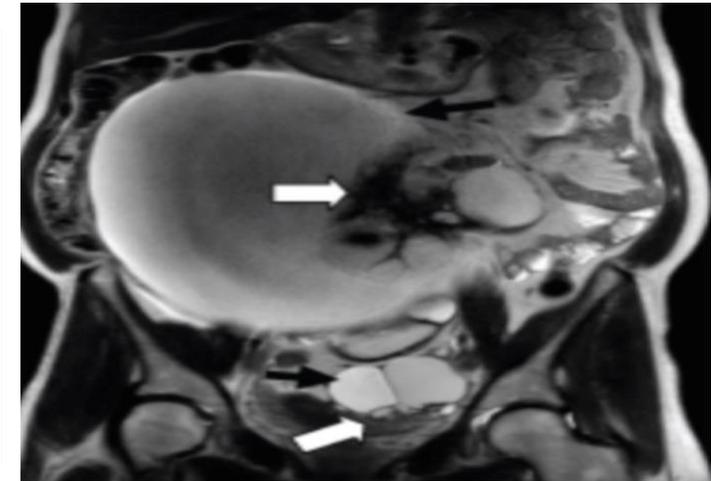
By Ultrasound

1) Simple cyst: unilocular , small , regular in shape round or oval , thin wall, anechoic fluid, no solid components, no free fluid in Pouch of Douglas , no other masses.



How to differentiate between simple and complex cyst?

2) Complex cyst : irregular, multilocular (different echogenicity equals different components), solid components, papillary projections, septations, associated with ascites either in the pelvis or pouch of Douglas.



Management of premenopausal simple cyst:

****fluid containing structure less than 3cm called follicle and larger than 3cm called cyst****

The management depends on the size of the cyst :

1) Cysts from 3-5 cm: does not require treatment or follow up .

Mostly physiological either follicular or corpus luteal and almost always resolve within 3 menstrual cycles.

2) Cysts from 5-7 cm: ultrasound follow up every year.

Management of premenopausal simple cyst:

3) Cysts larger than 7 cm: either further imaging such as MRI to know the exact component of the cyst or surgical (try to be conservative as possible).

4) Cysts that persist or increase in size after several cycles: need surgical intervention because these cysts are unlikely to be functional and at increase risk of pain and ovarian accidents.

**With the widespread use of ultrasound in clinical practice incidental finding of simple ovarian cysts has become commonplace. In one study 4% of women, with a median age of 26 years, had an ovarian cyst greater than 30 mm in diameter in their luteal phase.

*The use of **combined oral contraceptive pill** does not promote the resolution of functional ovarian cysts.

***The laparoscopic approach** for elective surgical management of ovarian masses presumed to be benign is associated with lower postoperative morbidity and shorter recovery time. Laparoscopic management is cost effective because of the associated earlier discharge and return to work.

*In the presence of large masses with solid components for example large dermoid cyst laparotomy may be appropriate.

***Aspiration of ovarian cysts** either vaginally or laparoscopically is less effective and associated with high rate of recurrence.

***Spillage of cyst contents** should be avoided where possible because pre/intraoperative assessment cannot absolutely preclude malignancy and it can result in chemical peritonitis.

Risk of Malignancy Index (RMI)

The RMI I combines three pre surgical features. It is a product of the serum CA125 level (iu/ml); the menopausal status (M); and an ultrasound score (U) as follows:

$$\text{RMI} = \text{U} \times \text{M} \times \text{CA125}$$

The ultrasound result is scored 1 point for each of the following characteristics: multilocular cysts, solid areas, metastases, ascites and bilateral lesions.

U = 0 (for an ultrasound score of 0)

U = 1 (for an ultrasound score of 1)

U = 3 (for an ultrasound score of 2–5)

The menopausal status is scored as:

1 = premenopausal

3 = postmenopausal

Serum CA125 is measured in iu/ml and can vary between zero and hundreds or even thousands of units.

IOTA classification

B-rules

Unilocular cysts

Presence of solid components where the largest solid component < 7 mm

Presence of acoustic shadowing

Smooth multilocular tumour with largest diameter < 100 mm

No blood flow on colour Doppler

M-rules

Irregular solid tumour

Ascites

At least four papillary structures

Irregular multilocular solid tumour with largest diameter \geq 100 mm

Prominent blood flow on colour Doppler

Management of ovarian cyst in postmenopausal women

- Cyst in a post menopausal woman is a tumor until proven otherwise.
- Incidence is approx between 4 – 17%.
- Can be detected incidentally.

- **BEAT symptoms:**

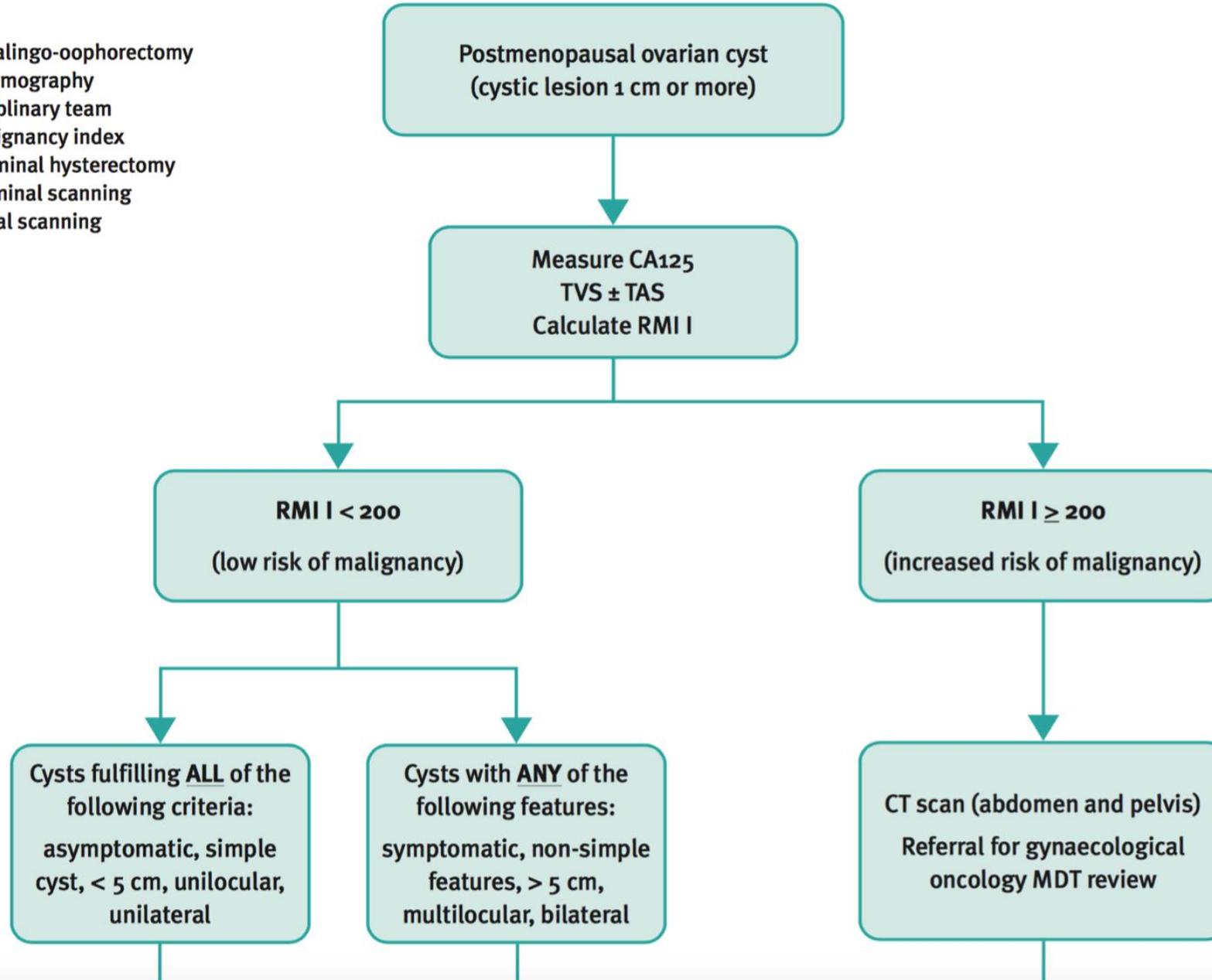
1-Bloating 2- Early satiety 3- Abdominal Distension /Pain 4-Toilet (Urinary frequency).

1.History 2.Full examination

3.USS 4.Blood tests – CA 125 5.CT TAP/MRI

Abbreviations

- BSO** bilateral salingo-oophorectomy
- CT** computed tomography
- MDT** multidisciplinary team
- RMI** risk of malignancy index
- TAH** total abdominal hysterectomy
- TAS** transabdominal scanning
- TVS** transvaginal scanning



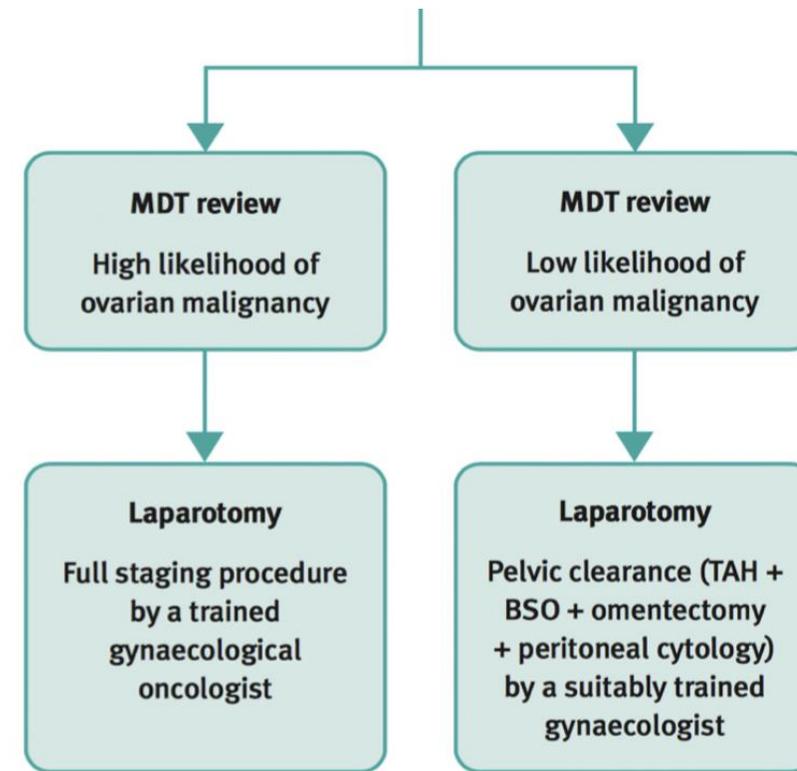
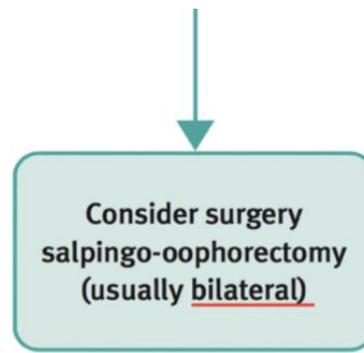
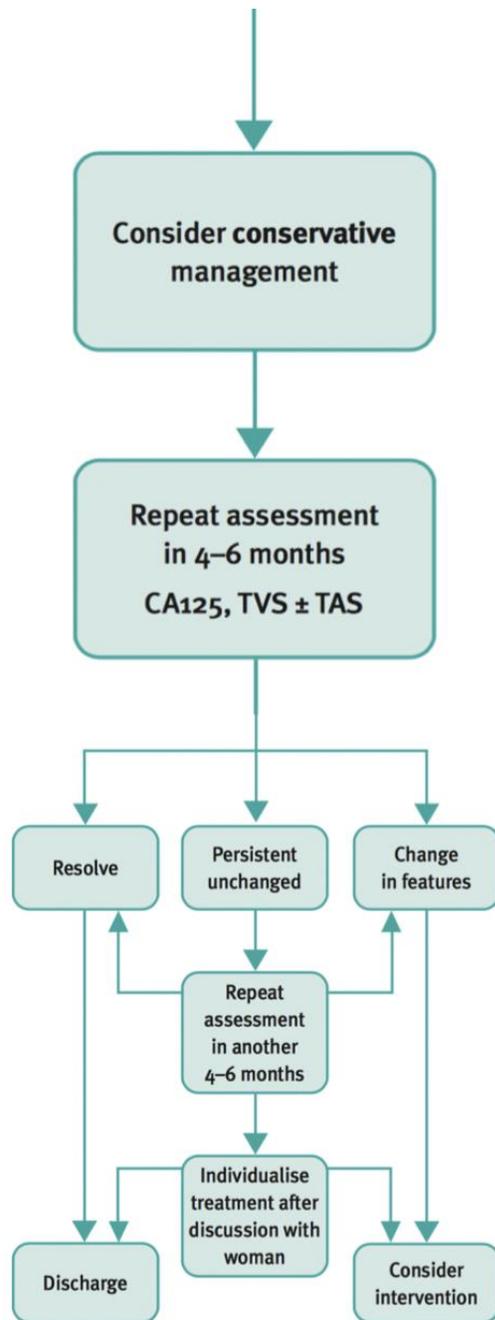


Table 11.1 Types of benign ovarian cyst

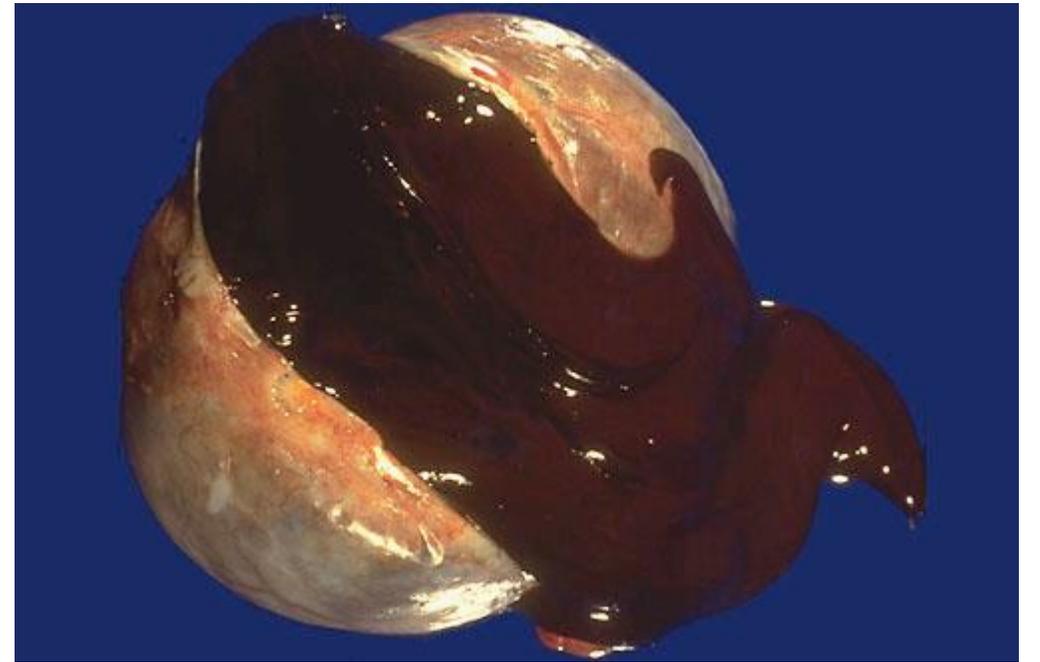
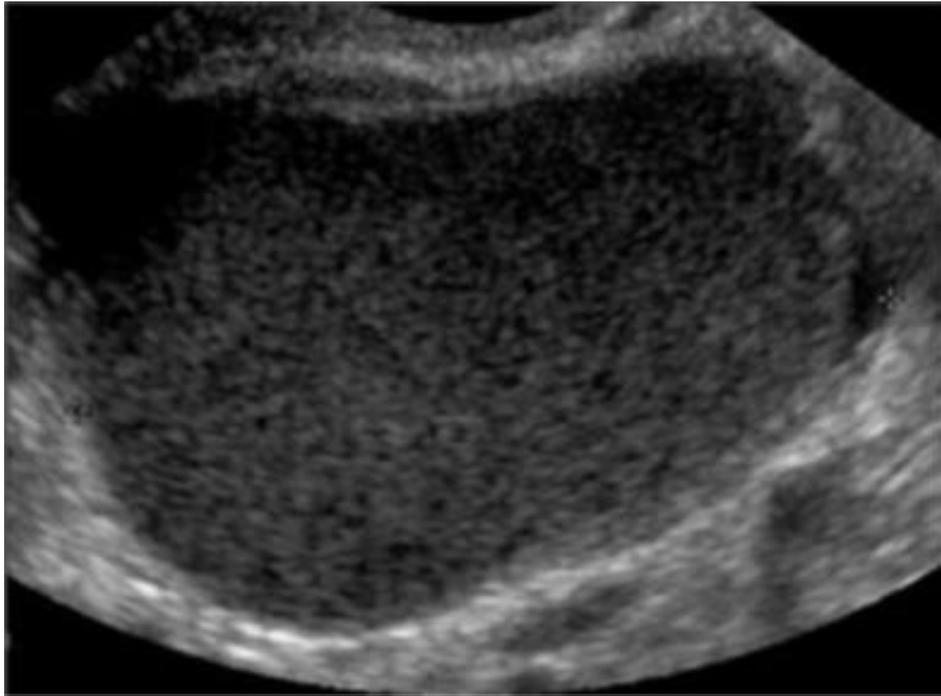
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|------------------|--|
| Functional | Follicular cyst Corpus luteal cyst Theca luteal cyst |
| Inflammatory | Tubo-ovarian abscess Endometrioma |
| Germ cell | Benign teratoma (dermoid cyst) |
| Epithelial | Serous cystadenoma Mucinous cystadenoma Brenner tumour |
| Sex cord stromal | Fibroma Thecoma |

Endometrioma / Chocolate Cyst

- Common with ovarian endometriosis
- Most common in young women.
- Presents with dysmenorrhea, dyspareunia, infertility.
- Ultrasound will show a **complex cyst**
- Definitive diagnosis is made by **laparoscopy**
- **Treatment** : NSAIDs for symptomatic relief, OCPs, GnRH analogues
- **Surgical removal** if the patient is symptomatic, infertile or the endometrioma is larger than 5 cm.

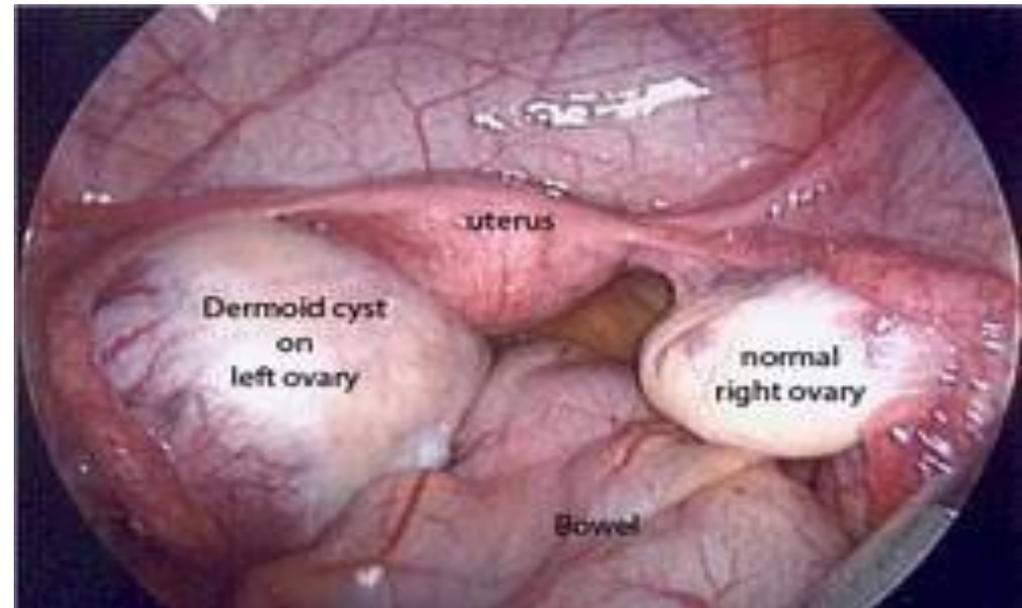
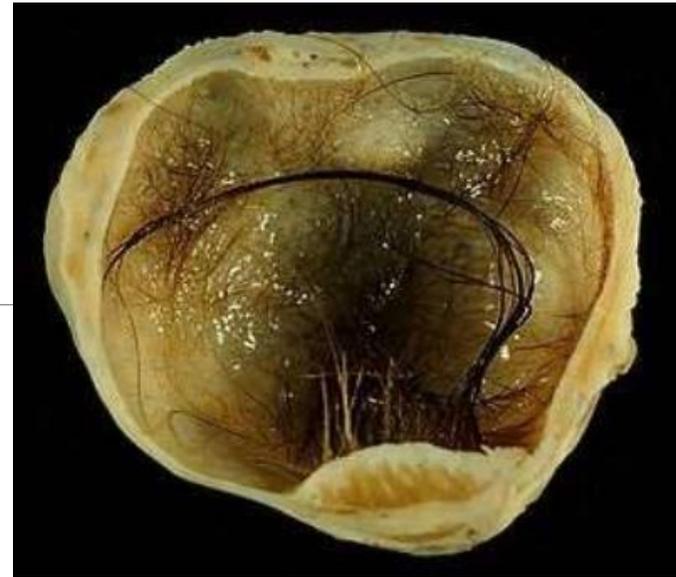


Endometrioma / Chocolate Cyst



Mature teratoma/ dermoid cyst

- One of the most common complex ovarian cysts in premenopausal women.
- Which contains fully differentiated tissue types derived from all three embryonic germ cell layers (mesenchymal, epithelial and stroma). Hair, teeth, fat, skin, muscle, cartilage, bone and endocrine tissue are frequently present
- Composed primarily of ectodermal tissue, with some mesodermal and rarely endodermal elements.
- Due to its heavy weight it is likely to twist around its vascular supply leading to ovarian torsion.
- 15-20% are bilateral
- The risk of malignant transformation is rare (<2%)
- Cystic teratomas (dermoid) should be treated by ovarian cystectomy because spontaneous resolution is unlikely.
- Cystectomy will prevent ovarian torsion and provide tissue for histological analysis.



Ovarian Cancer

- Fourth most common cancer for women
- Life time risk is 1-2%
- 10% is familial :BRCA/Lynch
- 80% postmenopausal
- **Pathology:**
 - I. Epithelial 90%
 - II. Germ Cell tumor 3%
 - III. Sex cord stromal tumor: less than 2%

1) Epithelial Tumors

Serous 75%

Endometrioids 10%

Clear Cell 7%

Mucinous 5% (grows to large size)

Carcinosarcoma (rare / aggressive/advanced stage / poor prognosis)

2) Germ cell tumors

Dysgerminoma (most common)

Yolk sac tumor

Embryonal carcinoma

Choriocarcinoma

Teratoma

3) Sex cord stromal tumor

Granulosa cell tumor (produces estrogen and may cause abnormal uterine bleeding)

Sertoli- Leydig tumor

Steroid cell tumor

Fibroma/thecoma(presents with meigs syndrome)

Meigs' syndrome is classically defined as the triad of ascites, pleural effusion, and benign ovarian fibroma.

Risk factors: (anything will result in more ovulation)

1. Age
2. Nulliparity
3. Early menarche
4. Late menopause
5. Late age at first birth
6. Ovarian stimulation
7. Family history
8. Obesity
9. Ionizing radiation

Protective factors: (anything will result in less ovulation)

1. Increasing parity
2. OCP
3. Breastfeeding
4. Tubal ligation
5. Salpingectomy: there are some theories state that ovarian cancer origin from the fallopian tube so once we remove them this will reduce the risk.
6. Hysterectomy

Genetic Risk:

1. **BRACA1:** 45% associated with breast cancer in 72%
2. **BRACA2:** 27% associated with breast cancer in 69%
3. **Lynch syndrome (non polyposis colorectal cancer):** associated with CRC in 60-80% and Endometrial cancer in 40%

Familial factor:

1. One person first degree relative : 4%
2. Two persons first degree relative : 12%

Presentation:

In most cases it is asymptomatic

1. Abdominal or pelvic pain
2. Bloating
3. Early satiety
4. Urinary symptoms
5. Dyspareunia
6. Abnormal uterine bleeding
7. Weight loss

Recognize the signs &



Bloating that is persistent
Eating less and feeling fuller
Abdominal pain
Trouble with your bladder

rule

Any patient more than 40 years old complaining from new or recurrent IBS symptoms, should be evaluated to rule out ovarian malignancies.

Investigations

Tumor markers

1) Alpha- Feto protein 2) Beta- HCG 3) Lactate dehydrogenase 4) CA-125

Imaging

CT Tap/ Pelvic MRI

Histology/ Cytology

Peritoneal tapping (If ascites is present), Pleural tapping (If pleural effusion is present).

Optimization of comorbidities

MDT

Refer to a gynecological oncologist when:

1. Serum CA-125 of more than 200 units/ml.
2. Ascites.
3. Evidence of abdominal or distant metastasis.
4. First degree relative with breast or ovarian cancer.

Management

Primary cytoreduction

Removal of fallopian tubes, omentum, parts of the peritoneum, pelvic lymph nodes, paraaortic lymph nodes, bowel resection in advanced stages.

Neoadjuvant chemotherapy (3-4k carboplatin/ paclitaxel)

Adjuvant chemotherapy (6k carboplatin/ paclitaxel)

PARPi

Ovarian Torsion

Ovarian torsion is caused by twisting of the ligaments that support the adnexa, cutting off the blood flow to the organ where it goes septic and die if left untreated.

The fallopian tube often twists with the ovary is referred to as adnexal torsion.

It represents a true surgical emergency.

Risk Factors:

Increased length of ovarian ligament

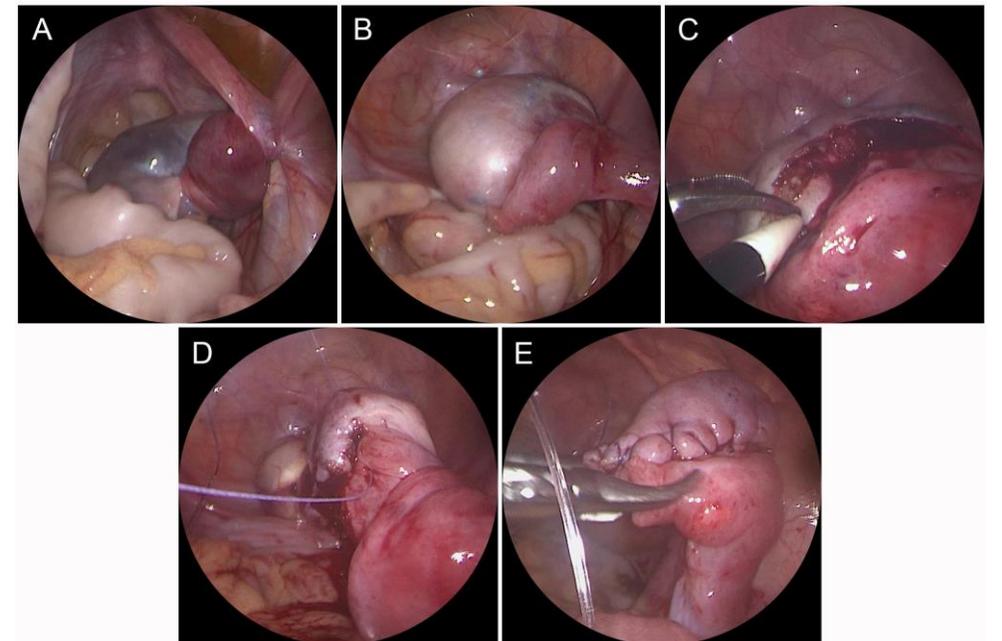
Large ovaries more than 6 cm

Ovarian masses or cysts

Enlarged corpus luteum in pregnancy

Presence of a mobile ovarian mass

History of prior ovarian torsion



Clinical Features

Toxic appearance

The symptoms of a twisted ovary arise suddenly and intensely. They include severe unilateral pain in the pelvic region, as well as nausea and vomiting. The sudden pain is often preceded by occasional cramps for several days, or sometimes, for weeks (often because the ovary twists and untwists repeatedly).

Fever

On physical examination, abdomen is tender +/- guarding

Investigations

IT IS A CLINICAL DIAGNOSIS!!

1) CBC:

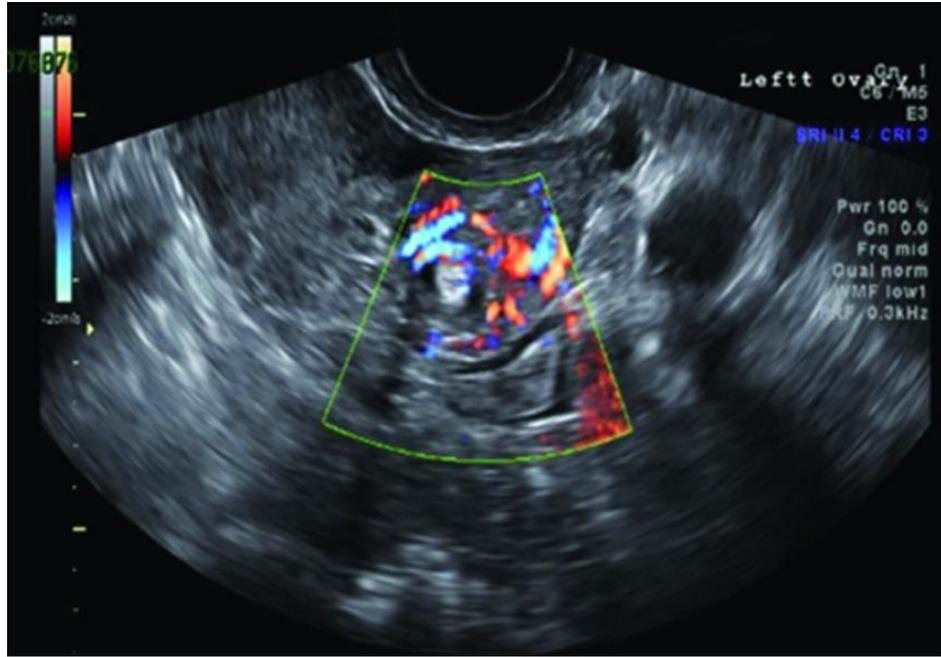
Raised WBC count (shifted to the left) and high CRP
(A right ovarian torsion can mimic an appendicitis)

2) Doppler US:

- a) Little or no intra-ovarian venous flow.
- b) Less commonly, there is an absent arterial flow.

3) TVS:

- a) Enlarged hypoechogenic or hyperechogenic ovary
- b) Peripherally displaced ovarian follicles
- c) Free pelvic fluid. This may be seen in more than 80% of cases
- d) Whirlpool sign of twisted vascular pedicle
- e) Uterus may be slightly deviated towards the torsed ovary.



Whirlpool Sign

Ovarian Edema



Management

ABCDE

Analgesia

Laparoscopy to uncoil the torted ovary

Possibly oophoropexy to fixate the ovary which is likely to twist again

Where blood flow is cut off to the ovary for an extended period of time, necrosis of the ovary can occur

So progress oophorectomy

Postoperative care — Postoperative care and instructions following detorsion should include observation for signs of peritonitis or sepsis (fever, worsening abdominal pain, peritoneal signs, hemodynamic instability). This rare complication was reported in a pregnant patient who underwent laparotomy and detorsion of a hyperstimulated ovary with reperfusion of the torsed adnexa observed intraoperatively.

Tubo-ovarian abscess

- Inflammatory mass of fallopian tube, ovary, and occasionally adjacent organs characterised by the presence of pus
- Serious complication of PID and can be life-threatening condition
- Diagnosed when a patient with PID has a pelvic mass that is palpable during bimanual examination
- Risk factors include: multiple sexual partners, IUD use, HIV
- Common organisms: E.coli, Streptococci, Bacteroides fragilis, Peptostreptococcus

Clinical features

- Lower abdominal or vaginal pain
- Fever
- Adnexal mass
- Cervical motion tenderness
- Uterine tenderness

Diagnosis

The diagnosis is made when the clinical findings are associated with raised inflammatory markers and radiological findings demonstrating a mass.

Investigations

Transvaginal ultrasound

CBC

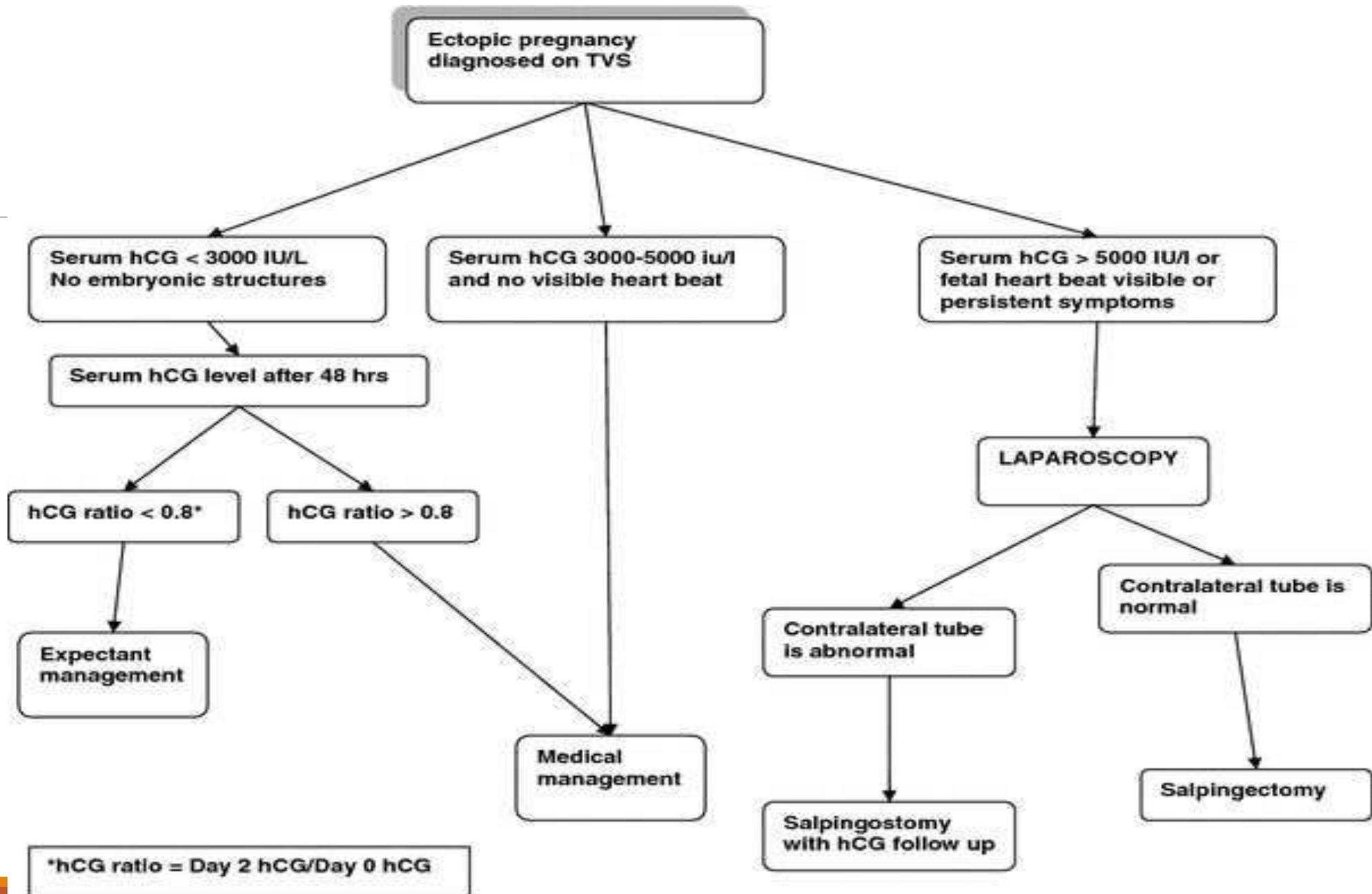
Treatment

- 70% of women with tubo-ovarian abscess respond to antimicrobial therapy alone.
- Failure of medical therapy suggests the need for drainage of the abscess.

| TABLE 22-6 |
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| CENTERS FOR DISEASE CONTROL (CDC) RECOMMENDED FIRST-LINE REGIMEN FOR PARENTERAL TREATMENT OF PELVIC INFLAMMATORY DISEASE |
| Recommended Parenteral Regimen A |
| Cefotetan 2 g IV every 12 hours |
| OR |
| Cefoxitin 2 g IV every 6 hours |
| PLUS |
| Doxycycline 100 mg orally or IV every 12 hours |
| Recommended Parenteral Regimen B |
| Clindamycin 900 mg IV every 8 hours |
| PLUS |
| Gentamicin loading dose IV or IM (2 mg/kg of body weight), followed by a maintenance dose (1.5 mg/kg) every 8 hours. Single daily dosing (3 to 5 mg/kg) can be substituted. |
| Alternative Parenteral Regimens |
| Ampicillin/sulbactam 3 g IV every 6 hours |
| PLUS |
| Doxycycline 100 mg orally or IV every 12 hours |

Ectopic Pregnancy

- Implantation of a fertilized egg in a location outside the uterine cavity (the fallopian tube in approximately 97.7% of cases).
- **Risk factors:** PID, surgery, ligation, history of previous ectopic pregnancy, IUD and smoking.
- **Clinical triad:** Pain, amenorrhea and vaginal bleeding.
- **Diagnosis:** Abnormal doubling and ultrasound.
- Ruptured vs intact.
- **Treatment:** Expectant, medical and surgical.



Fibroids (leiomyomas)

Uterine fibroids are noncancerous monoclonal tumors arising from the smooth muscle cells and fibroblasts of the myometrium.

Fibroids are the most common neoplasm of the uterus.

Occurs in 70% of women over the age of 50

Risk Factors:

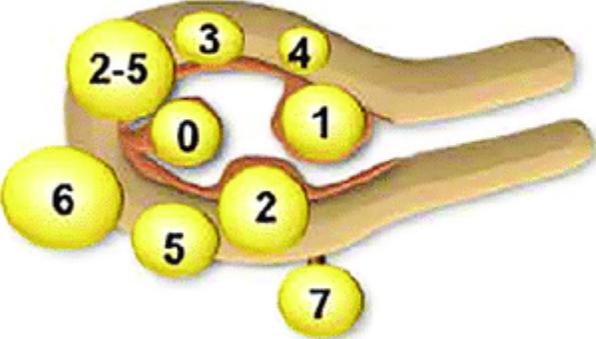
1. Nulliparity
2. Early menarche and late menopause
3. Obesity
4. African American race
5. Family history of fibroids
6. PCOS
7. Age

Protective Factors:

1. Smoking
2. Multiparity
3. Progestin Pills
4. Late menarche

FIGO Leiomyoma Subclassification System

Leiomyoma Subclassification System



| | | |
|-----------------------|---|--|
| S – Submusosal | 0 | Pedunculated intracavitary |
| | 1 | < 50% intramural |
| | 2 | ≥ 50% intramural |
| O – Other | 3 | Contacts endometrium; 100% intramural |
| | 4 | Intramural |
| | 5 | Subserosal ≥ 50% intramural |
| | 6 | Subserosal < 50% intramural |
| | 7 | Subserosal pedunculated |
| | 8 | Other (specify e.g. cervical, parasitic) |

| | | |
|--|--|--|
| Hybrid leiomyomas (impact both endometrium and serosa) | Two numbers are listed separated by a hyphen. By convention, the first refers to the relationship with the endometrium while the second refers to the relationship to the serosa. One example is below | |
| | 2-5 | Submusocal and subserosal, each with less than half the diameter in the endometrial and peritoneal cavities, respectively. |

Clinical presentation

- 80% are asymptomatic
- Abnormal uterine bleeding
- Infertility
- Pelvic pressure
- Bloating
- Heaviness in the lower abdomen
- Low back pain
- Recurrent miscarriages if pregnant
- Frequency of urination and nocturia

Investigations

Transvaginal ultrasound

MRI

Management

Management of fibroids is influenced by many factors including the age of the patient, her fertility wishes, whether or not she has any symptoms, and the size and number of fibroids present.

1. Expectant

2. Medical:

Mirena

GnRH agonists

Progesterone

NSAIDs

3. Surgical:

Myomectomy

Hysterectomy

Uterine Artery Embolization

Adenomyosis

Adenomyosis is defined as the extension of endometrial glands and stroma into the uterine musculature more than 2.5 mm beneath the basalis layer.

It occurs most often in multiparous women at the end of their reproductive life.

Risk factors:

- High parity
- Vigorous curettage of the uterus

Presentation

- Heavy menstrual bleeding
- Progressive dysmenorrhea
- Deep dyspareunia (especially premenstrually)
- Symmetrical enlargement of the uterus

Diagnosis

Historically the diagnosis of adenomyosis was made based on histologic assessment of hysterectomy specimens.

However, the diagnosis is now made by imaging-based criteria using transvaginal ultrasonography (TVUS) and/or magnetic resonance imaging (MRI).



FIGURE 25-5 Enlarged uterus cut open to demonstrate homogeneous enlargement caused by adenomyosis. A diagnosis of leiomyomata may be incorrectly made at the time of pelvic examination. (Courtesy Dr. Sathima Nataratan, Ronald Reagan—UCLA Medical Center.)

Management

Conservative management with NSAIDs and hormonal control of the endometrium are mainstays of therapy.

If medical treatments do not sufficiently control her symptoms, hysterectomy may be indicated.

Endometrial ablation to control the bleeding is another option.

Thank You

