Benign Ovarian Tumors

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★ Causes :-

1. Functional → ① Follicular Cyst
   ② Corpus Luteal Cyst
   ③ Theca Luteal Cyst
   ④ Luteomas Of Pregnancy (rare)
2. Inflammatory → ① Tubo-Ovarian Abscess
3. Other → ① EndoMetrioma
4. Neoplastic → Germ Cell → ① Bengin Teratoma (Dermoid Cyst)
   → Epithelial → ① Serous Cyst Adenoma
   ② Mucinous Cyst Adenoma
   ③ Brenner Tumor
   → Sex Cord Stromal → ① Fibroma
   ② Thecoma
   ③ Granulosa cell Tumors
   ④ Sertoli-Leydig cell Tumors

★ Clinical Presentation :-

- Most are Asymptomatic
- Chronic pattern → ① Pain ② Abdominal distintion
- Secondary symptoms → ① Anorexia ② Nausea ③ Vomiting ④ Urinary frequency
- may be associated with → ① Amenorrhea ② Menstrual irregularity ③ Precocious puberty ④ Virilization
- become Acutely Symptomatic if undergoes Torsion, Rupture or Hearmorrhage
- Benign Ovarian Neoplasm are Indistinguishable Clinically from Malignant counterparts

★ Complications :-

① Torsion ⇝ commonly in → Germ Cell → Bengin Teratoma (Dermoid Cyst)
→ Epithelial → Serous Cyst Adenoma

② Intracystic Hemorrhage ⇝ in → Venous Congestion
→ Epithelial → Serous Cyst Adenoma

③ Rupture ⇝ Following Trauma

④ Infection ⇝ Following Torsion

⑤ Pseudo-Myxoma Peritonei ⇝ in Epithelial → Mucinous Cyst Adenoma

⑥ Intestinal Obstruction

⑦ Malignancy ⇝ Rare

★ Investigation :- difinitive diagnosis by Histopathology

- Routine :

① CBC ② ESR ③ CXR ④ ECG ⑤ Urine test ⑥ LFT ⑦ KFT

- Specific :

① Ultrasound → First Line test (Gold Standard) → Trans-Abdominal
→ Trans-Vaginal → for obese female

support Dx but definitive Dx by histo patho

Table 2. IOTA Group ultrasound 'rules' to classify masses as benign (B-rules) or malignant (M-rules)[38,51]

B-rules	M-rules
Unilocular cysts	Irregular solid tumour
Presence of solid components where the largest solid component <7 mm	Ascites
Presence of acoustic shadowing	At least four papillary structures
Smooth multilocular tumour with a largest diameter <100 mm	Irregular multilocular solid tumour with largest diameter ≥100 mm
No blood flow	Very strong blood flow

② Doppler Color flow → increase the confidence with which a correct diagnosis of benignity or malignancy is made

③ CT scan & MRI → for Metastasis

④ Genetic analysis

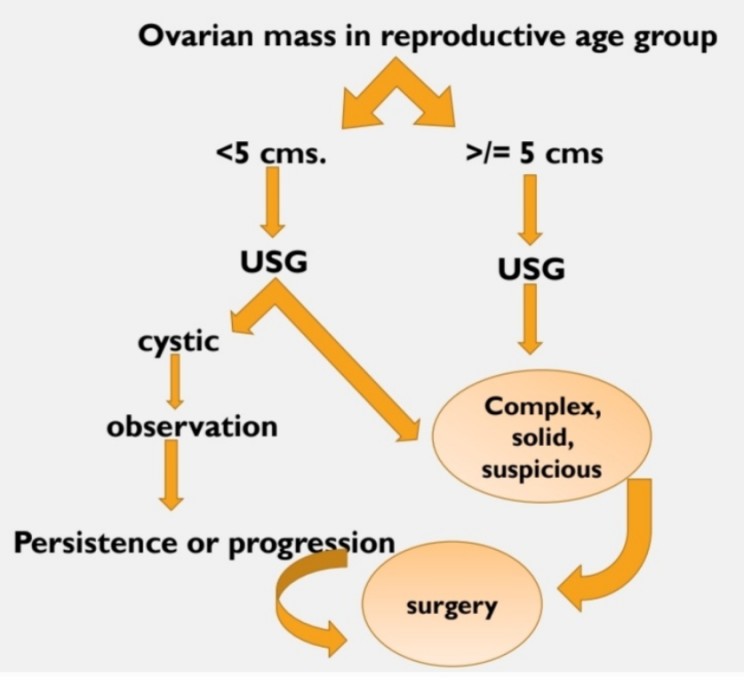
⑤ Endoscopy & Laparoscopy

⑥ Tumor Markers →
- CA 125 ⇝ ① risk malignancy index ② follow up ⇝ elevated in Non-Mucinous Epithelial cancers
- CA 19-9 ⇝ elevated in Mucinous Epithelial cancers
- CEA ⇝ elevated in → (85-90% of Mucinous Epithelial cancers) → (30% of other Epithelial cancers)
- HE4

★ Treatment :-

① **Surgery**

- Laparoscopy ⇝ Less pain, shorter hospital stay, fewer adverse effect
- Laparotomy



② **Cyst Aspiration** ⇝ high recurrance rate, for patient who not fit for surgery

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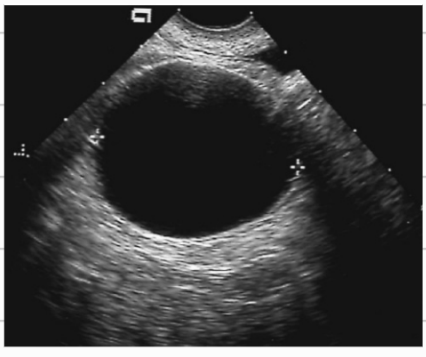
1 Functional Ovarian Cysts (Physiological)

* **Most Common** Clinically detectable Enlargements of the Ovary
* in the **Reproductive years**
* All are **Benign**
* **Asymptomatic**
* **Management :-** ① Expetant ② Watchful waiting for 2 or 3 cycles
  ③ OCP → not benefit ④ if persist or Symptomatic → Surgical management
* **Management according to the Size of Cyst :-**
  ① < 5 cm → Not require follow up
  ② 5-7 cm → Yearly US
  ③ > 7 cm → require further Imaging or Surgical Intervention
* **Types :-** ① Follicular Cyst
  ② Corpus Luteal Cyst
  ③ Theca Luteal Cyst

① Follicular Cyst :

- Most Common
- diameter >3 cm ⇝ Rarely >8 cm — Unilateral
- found Incidentally on pelvic examination
- lined by Granulosa cells
- usually Resolve within 4-8 weeks
- may Rupture or Torse causing Pain & Peritoneal Symptoms



- Characteristics on US:-
  1. Anechoic (cyst filled with fluid)
  2. Smooth, Thin wall
  3. No internal flow on doppler
  4. Posterior acoustic enhancement

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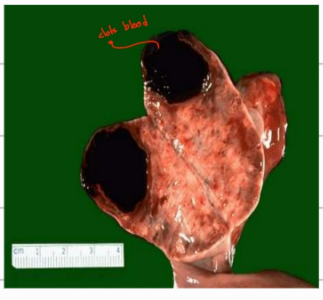
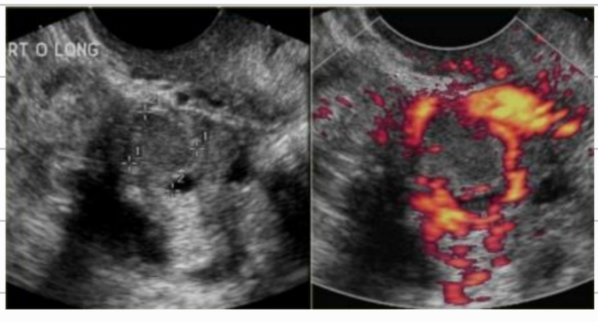
② Corpus Luteal Cyst :



- Less common
- diameter ≤3 cm — Unilateral
- Un Ruptured cyst causing Pain
- may Rupture causing Hemoperitoneum ⇝ require Surgical management (more in patients taking Anti-Coagulants or with bleeding diathesis)
- Characteristics on US:-
  1. diffusely Thick wall
  2. cystic have Solid part
  3. peripheral blood flow (Ring of fire) on doppler
  4. Internal acoustic enhancement



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③ Theca Luteal Cyst :

- Least common
- Bilateral
- result from overstimulation of the ovary by β-hCG
- Not commonly occur in Normal pregnancy
- diameter Large up to 30 cm
- regress Spontaneously

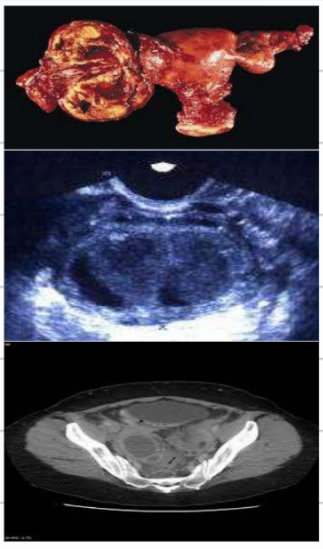
- multicystic

- Kissing Ovaries

- associated with Hydatidiform moles, Choriocarcinoma, Multiple Gestations, use of Clomiphene & GnRH analogues.

2 Inflammatory Ovarian Cysts

① Tubo-Ovarian Abscess :

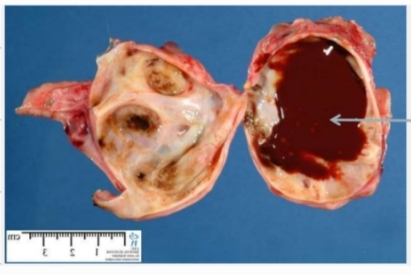


- presents in 14-38% of patients with **Pelvic Inflammatory Disease**
- commonly seen in pateints with Poor access to routine gynecologic care
- Diagnosis of PID → ① Bilateral abdominal pain
  ② Bilateral adnexal tenderness & cervical motion tenderness
  ③ Hydrosalpinx ⇝ **Anechoic**
  ④ Pyo salpinx ⇝ **increased Echoes within the fluid**

3 Other

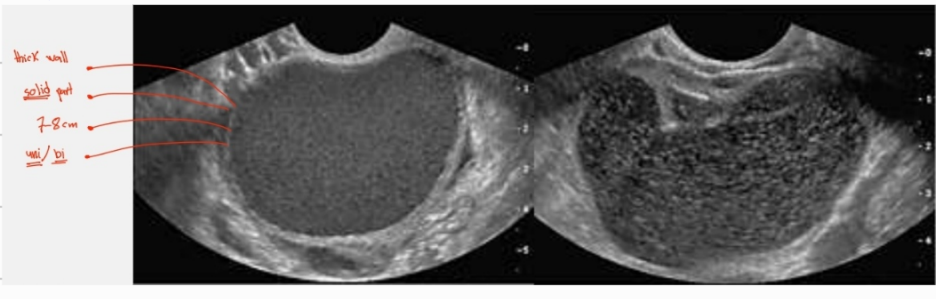
① EndoMetrioma of the Ovary :

- **pseudocysts** ⇝ formed by invagination of the ovarian cortex, sealed off by adhesions
- may completely replace normal ovarian tissue
- Malignant transformation (0.3 to 0.8%)
- **Management :-** ① Medical ② Surgical
- Characteristics on US :-



Chocolate cyst of Ovary on cut section

① **Anechoic** to **diffuse low-level Echoes** to **Solid appearing mass**
② Fibrotic, **Thick** wall
③ Fluid-fluid or Debris-fluid levels
④ Uni-locular or Multi-locular
⑤ Thin or Thick Septations



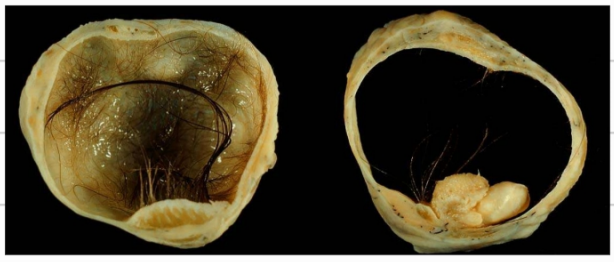
4 Neoplastic

* Types :- → Germ Cell → ① Bengin Teratoma (Dermoid Cyst)
→ Epithelial → ① Serous Cyst Adenoma
② Mucinous Cyst Adenoma
③ Brenner Tumor
→ Sex Cord Stromal → ① Fibroma
② Thecoma
③ Granulosa cell Tumors
④ Sertoli-Leydig cell Tumors

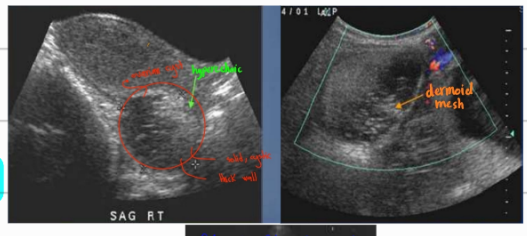
Treatment of Neoplastic tumors is Simple Excision of solid tumors

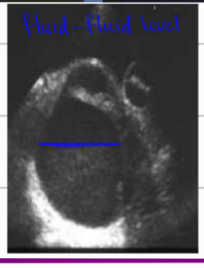
Germ Cell

① Bengin Teratoma (Dermoid Cyst) (Mature Cystic Teratoma):



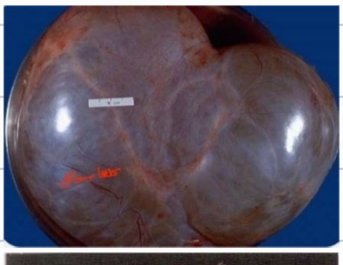
- Bilateral (15-25%)
- young age (18-35 year)
- Malignant change occure in (1-3%) usually of Squamous type
- Risk of Torsion (15%)
- **Management**:- Ovarian Cystectomy
- Gross: Thick, Opaque, Whitish Wall contain hair, bone, cartilage, sebaceous material
- Microscopically: All 3 germ layers
- Characteristics on US:-
  1. Focal or Diffuse hyperechoic component with distal acoustic shadowing
  2. Hyperechoic lines & dots (Dermoid mesh)
  3. No internal flow on doppler
  4. may see Fluid-Fluid level with the echogenic component layering nondepently





Epithelial

① Serous Cyst Adenoma:

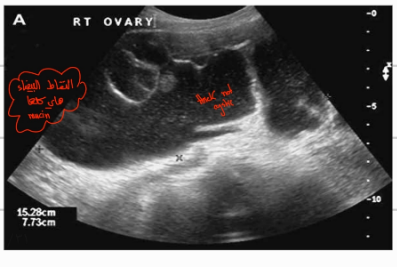


- Most Common
- Bilateral (10%)
- Risk of Malignancy: (5-10%) borderline, (20-25%) malignant
- Gross: Multi-locular with Papillary components
- Microscopically: Low Columnar epithelium with cilia. (Psammoma bodies)
- associated Fibrosis may lead to Cyst-Adeno-Fibroma

② Mucinous Cyst Adenoma:

Epithelium – tall, pale staining, secretary with basal nuclei and goblet cells

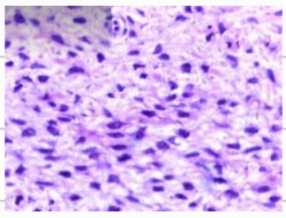
- Large
- Malignant (5-10%)
- Gross: round-ovoid mass with smooth, translucent or bluish to whitis gray Capsules
  Interior divided by discrete Septa into loculi containing Clear, Viscid Fluid
- Microscopically: Epithelium tall, pale staining, secretary with basal nuclei & goblet cells

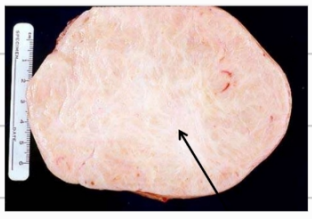


Sex Cord Stromal

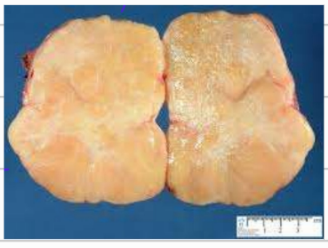
① Fibroma :

- Most Common Benign, Solid neoplasms of the ovary
- compose 5% of Benign ovarian neoplasms & 20% of all Solid tumors of the ovary
- Middle age
- characterized by Firmness, Not hormonally active
- misdiagnosed as Exophytic Fibroids or Primary Ovarian Malignancy
- may ba associated with Ascites, Hydrothorax ⇝ Mieg's Syndrome





② Thecoma :



- Uni Lateral
- usually >40 years, 65% after menopause
- Solid Fibromatous lesion, show varying degree of discoloration
- hormonally active associated with Estrogenic or Androgenic effects
- rarely Malignant

③ Granulosa cell Tumors :

- All age groups
- Hyper Estrogen State
- associated with Pseudo-Precocious Puberty ⇝ early breast development, menstrual disorder, postmenopausal bleeding
- Microscopically: round or slightly ovoid Granulosa Cells with its dark nucleus, mitosis are common, ovum like "Call Exner Bodies"

④ Sertoli-Leydig cell Tumors (Androblastoma) :

- < 40 years
- Hyper Androgen State
- generally Benign
- usually be Luteinised, simulating the classic pattern of the tests & producing steroids
- may produce the Masculinisation (الذكورة)