Benign Ovarian Masses

Introduction

- Ovarian masses are a frequent finding in general gynecology.
- Most are cystic (i.e not solid tumors)
- Divided into: Ovarian cystic neoplasms (benign neoplastic growth) or Functional ovarian cysts (created by disruption of normal ovulation)
- Incidence: 5-15% of patients

Ovarian cysts as a group

- Most are asymptomatic.
- Pain is common:
  - Pressure or ache from ovarian capsule stretching
  - dysmenorrhea may indicate endometrioma
  - acute severe pain with vomiting Indicate torsion.
- Other symptoms according to type of tumor, such as disruption of menstruation or virilization

Examination and inestigations

- Many cysts are found incidentally during imaging for other indications: they are typiclaly mobile, cystic, nontender and lateral to uterus
- β-hCG is important to rule out ectopic pregnancy, can serve as a tumor markers for some germ cell tumors (mixed germ cell tumors and ovarian choriocarcinoma)

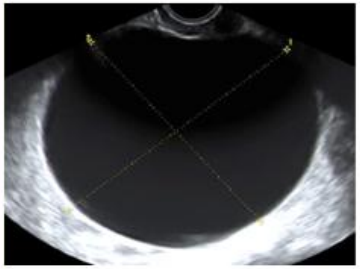
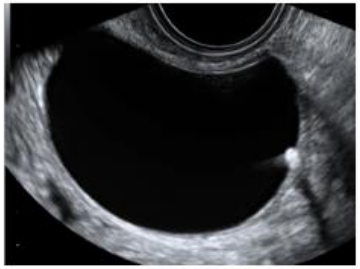
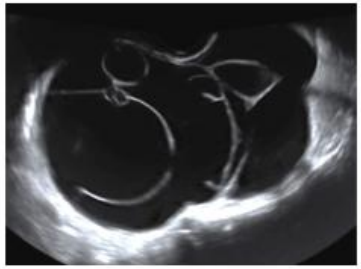
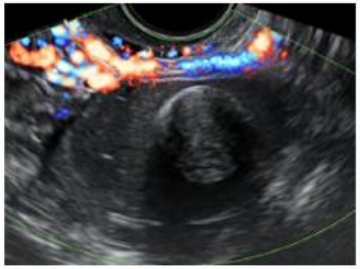
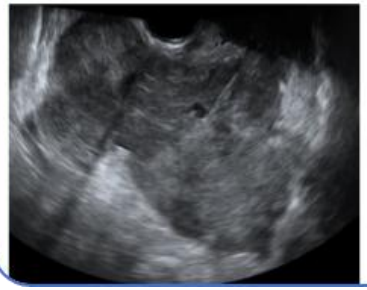
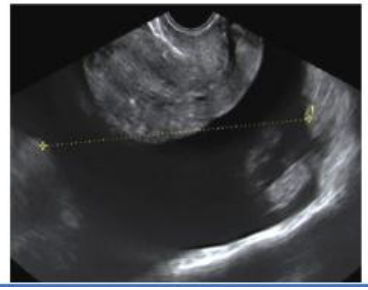
- CA125 in epithelial ovarian cancers
- CEA and CA19-9 in mucinous epithelial cancers
- AFP elevated in endodermal sinus tumors or embryonal cell carcinoma
- Inhibin A and B are markers for granulosa cell tumors
- LDH can be elevated in dysgerminoma

Imaging

- Sonography is first-line tool, transabdominal then transvaginal to avoid missing large abdominal masses.
- Concerning features: thick septa, increased vascularity, papillary growths, solid components within the cyst.
- CT is best used when malignancy is suspected to evaluate for metastasis, ascites or lymphadenopathy

Risk assessment tools

- RMI (risk of malignancy index): uses sonographic score, meopausal status and CA125 to stratify risk
- ROMA (Risk of Ovarian Malignancy Algorithms): uses human epidiymal protein 4 along with CA125 and menopausal status
- IOTA (International Ovarain Tumor Analysis): rules

B1 Unilocular	B2 Presence of solid components with largest diameter < 7 mm	B3 Presence of acoustic shadows	B4 Smooth multilocular tumor with largest diameter < 100 mm	B5 No blood flow (color score 1)
				
M1 Irregular solid tumor	M2 Presence of ascites	M3 At least 4 papillary structures	M4 Irregular multilocular-solid tumor with largest diameter ≥ 100 mm	M5 Very strong blood flow (color score 4)
				

Management

- Most ovarian cysts are functional and regress within 6 months, so expectant management may be resonable
- If showed concerning signs, size is more than 7 cm or CA125 is elevated, then further imaging or surgery
- Cyst aspiration is usually avoided to avoid seeding

Surgery

- Cystectomy Vs oopherectomy: depends on size, menopausal status and intraoperative findings
- Laparoscopy vs Laparotomy

Functional ovarian cysts

- Originate from ovarian follicles and are created during follicle maturation and ovulation.
- Either follicular cyst or Corpus luteal cysts
- In follicular cysts, hormonal dysfunction prior to ovulation results in expansion of follicular antrum with serous fluid
- In corpus luteal cysts, excessive hemorrhage from vessels after ovulation fills the center

Associated factors

- High dose OCPS suppress ovulation and thus the incidence of functional cysts, in contrast progestin only contraceptives increase the incidence
- Tamoxifen during breast cancer treatment can increase the risk for benign cysts

Management

- Rule out serious casues (ectopic)
- If asymptomatic observe
- COCs don’t hasten resolution
- If symptomatic or large: surgical removal

Theca lutein cysts

- *Hyperreactio lutealis*
- Uncommon type of follicular cysts
- Bilateral, multiple smooth-walled cysts, range in size 1-4 cm in diameter.
- This condition cause by elevated β-hCG or LH levels
- Associated conditions: GTD, Multifetal gestations, ovarian hyperstimulation during ARTs
- Risk of torsion due to large ovaries, regress after removal of stimulus

Benign neoplastic ovarian cysts

- Can be distinguished histologically based on cell type of origin
- Either epithelial tumors, germ cell tumors or sex cord- stromal tumors.
- Serous and mucinous cystadenomas and mature cystic teratoma are the most common

Benign serous and mucinous tumors

- Both are members of the surface epithelial neoplasia group
- Benign *serous* tumors are typically thin-walled, unilocular cysts filled with serous fluid. They are bilateral in 20% of cases.
- Benign *mucinous* tumors are typically thicker-walled, mucoid-containing, and may be uni- or multilocular

Ovarian Teratoma

- Belong to germ cell family
- Arise from a single germ cell, thus may contain any of three germ layers (ectoderm, endoderm or mesoderm)
- Mature teratomas, benign tumor, contains mature form of the three germ cell layers
- Immature terataoma, malignant tumor, and contain immature tissue from one or more of the cell layers

Mature teratoma

1. Mature cystic teratomas: develop into a cyst, commonly called dermoid cyst
2. Mature solid teratoma: has elements formed into a solid mass
3. Fetiform teratoma: extremely rare

**Monodermal terataomas: composed solely or predominantly of only one highly specialized tissue type (e.g struma ovarii)

Mature cystic teratoams

- About 10-25% of all ovarian neoplasms, 60% of all benign ovarian neoplasms.
- Most measure between 5-10 cm, they are slow-growing
- Bilateral in 10% of cases
- Usually unilocular, with are of localized growth protruding inside cavity (Rokitansky protuberance)

- Ectodermal tissues usually predominate
- Cyst is typically lined with keratinized squamous epithelium, and contain sebacsous and sweat glands
- Hair and fatty secretions found withtin
- Malignant transformation in less than 2%, with age >50, size >10cm. Mostly SCC

Symptoms

- Similar to other cysts
- Rarely can cause immune-mediated encephalitis

Diagnosis

- Sonography main imaging tool:

1. Fat-fluid or Hair fluid levels
2. Lines and dots that represents hair
3. Hyperechoic nodule measuring 1-4cm

- Serum markers are undiagnostic, CA19-9 elevated in 30% of cases

Complications

- Dermoid cysts can undergo torsion
- Cyst rupture is rare due to thick wall. If it does happen, acute peritonitis is common.
- Chronic leakage can lead to granulomatous peritonitis

Management

- Surgical excisison provides definitve diagnosis and treatment
- Laparoscopy is appropriate
- Intrabdomial irrigation is crucial if spill occurs
- Conservative management can be done, if fertility is desired and cyst is small. However, follow-up with sonography every 6-12 months.

Thank you