PATHOLOGY

- SHEET NO. 10
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Ovarian and fallopian tube pathology

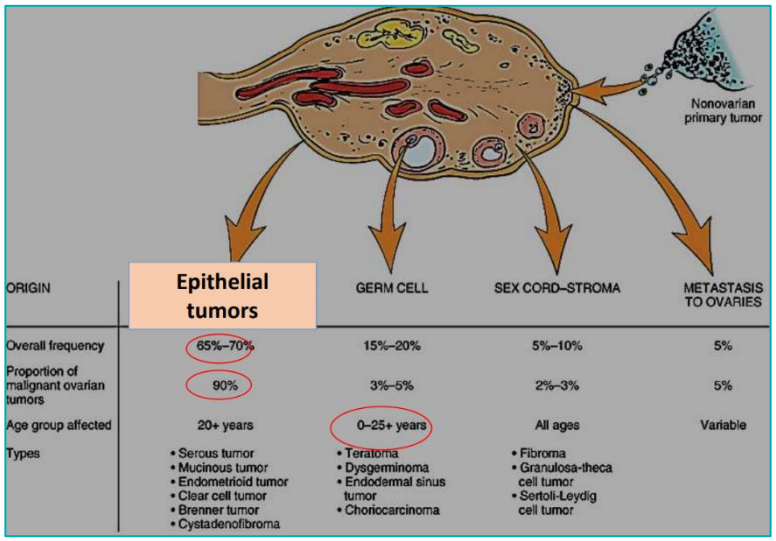
✤ Ovarian Neoplastic Diseases ✤

- 5th most common cancer in women
- 5th leading cause of cancer death in women
- **3 origins of primary ovarian tumors**:
  1. **Epithelium (The most common ovarian tumor, also represents the majority of malignant ovarian tumors)**
  2. **Germ cells**
  3. **Sex cord/Stromal cells**
- Each of these cell types gives rise to a variety of tumors
- **Secondary tumors of the ovary are metastatic malignancies that spread to the ovaries.**

➔ **Secondary tumors are always related to metastasis**

✪ Epithelial Ovarian Neoplasms:

- **Account for the majority of Ovarian tumors**
- **In their malignant forms, account for 90% of ovarian cancers**
- Previously were thought to arise from coelomic epithelium that covers the ovarian surface
- Recent studies have shown that they actually arise from the fimbriated end of fallopian tube or epithelial cysts in the cortex of ovary.



ORIGIN	Epithelial tumors	GERM CELL	SEX CORD–STROMA	METASTASIS TO OVARIES
Overall frequency	65%–70%	15%–20%	5%–10%	5%
Proportion of malignant ovarian tumors	90%	3%–5%	2%–3%	5%
Age group affected	20+ years	0–25+ years	All ages	Variable
Types	• Serous tumor • Mucinous tumor • Endometrioid tumor • Clear cell tumor • Brenner tumor • Cystadenofibroma	• Teratoma • Dysgerminoma • Endodermal sinus tumor • Choriocarcinoma	• Fibroma • Granulosa-theca cell tumor • Sertoli-Leydig cell tumor	

✪ Germ cells & Sex cord-stromal cell tumors:

- **Less frequent**
- **constitute 20% to 30% of ovarian tumors**
- **collectively responsible for less than 10% of malignant tumors of the ovary (so many of them are benign)**
- **Children who have ovarian tumors, will probably have Germ cell tumors**

Pathogenesis of Ovarian tumors:

➔ **Risk factors:**
1. **Nulliparity (Not having children; not giving birth)**
2. **Family History (Only 10%)**

Note: OCPs (oral contraceptive pills; حبوب منع الحمل) may reduce risk.

➔ OCPs and pregnancy reduce the risk, because of progesterone
➔ Estrogen maybe implicated in causing those tumors, progesterone is protective from ovarian neoplasms

➔ **Sporadic cases:**
- **BRCA 1 and 2** mutations: 10% of sporadic cases
- **P53 (50%)**
- **HER2/NEU** over-expression (35%)
- **K-RAS** protein over-expression (30%) (mucinous)

➔ **familial cases:**
- **BRCA 1 and 2**

✤ Epithelial Tumors ✤

Types: (first two only are covered in the lecture)

1. **Serous**
2. **Mucinous**
3. Endometrioid
4. Clear cell
5. Brenner

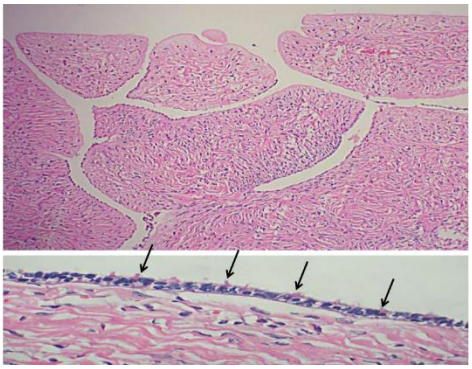
➔ **All types include benign, borderline, and malignant tumors**

✪ Serous Tumors:

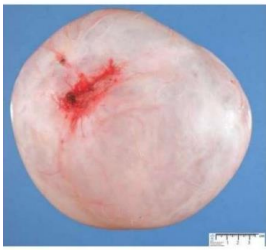
- **The most frequent ovarian tumors (**they're the **most** frequent epithelial tumors, and the **most** frequent ovarian tumors, and the **most** frequent malignant ovarian tumors (60%) **)**
- Include: 60% benign, 15% borderline, and 25% malignant
- Psammoma bodies can be seen in all types of serous tumors, the benign, border line & malignant
- **Genetics:**
  1. **BRAF and K-RAS mutations** → borderline & low grade serous carcinomas
  2. **p53 and BRCA1 mutations** → High-grade serous carcinomas

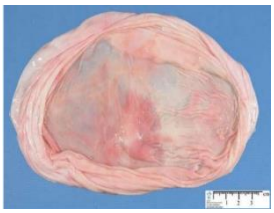
❖ Benign Serous Tumors:

- cystic ; large; (30 cm).
- May be bilateral.
- filled with a clear serous fluid
- **Under the microscope, we can see a single layer** of columnar epithelium. Some cells are ciliated.
- **Psammoma bodies** (laminated calcified concretions) are common in tips of papillae of all serous tumors

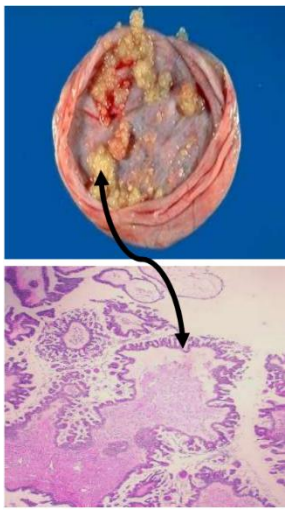


SEROUS CYSTADENOMA





❖ Borderline Serous Tumors:

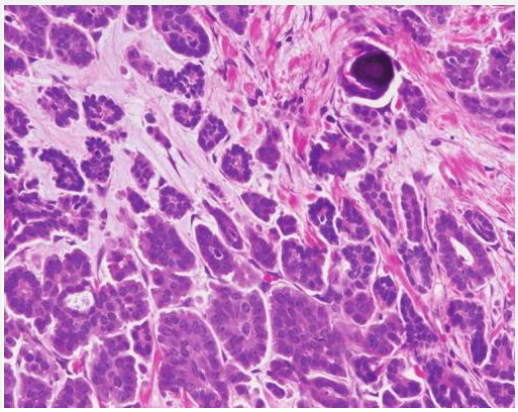


- **Complex architecture**
- Mild cytologic atypia
- **No stromal invasion**
- May have peritoneal implants (the tumor sends seeds that reach the peritoneum)
- They don't have all the characteristics of a malignant tumor, so they're not classified as malignant
- can recur and some can progress to carcinoma
- Prognosis: intermediate between benign and malignant types
- (survival with peritoneal metastases 75%)

❖ Malignant Serous Tumors (2 types):

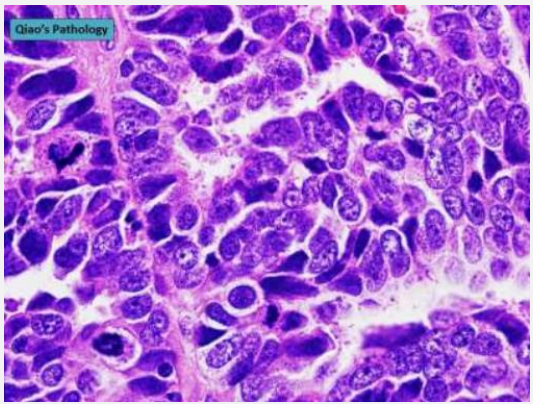
Low-grade serous carcinoma

- arise from borderline lesions
- progress slowly to become invasive carcinoma
- differentiated morphology
- **mutations in KRAS**



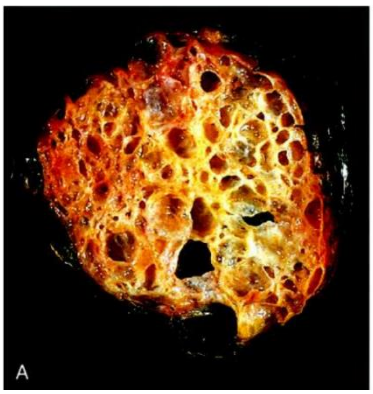
High-grade serous carcinoma

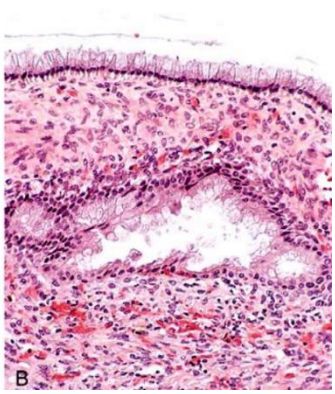
- develop rapidly
- many arise form fallopian tube via serous tubal intraepithelial carcinoma, rather than ovarian coelomic epithelium.
- **mutations in TP53**
- Anaplasia of cells and invasion of the stroma
- prognosis is poor, depends on stage at the time of diagnosis.



✪ Mucinous Ovarian Tumors:

- **Mucin-secreting cells.**
- 80% benign; 10% borderline; 10% malignant (cystadenocarcinoma)
- Usually large and multilocular.
- **psammoma bodies aren't found (only found in serous)**
- stage is major determinant of prognosis





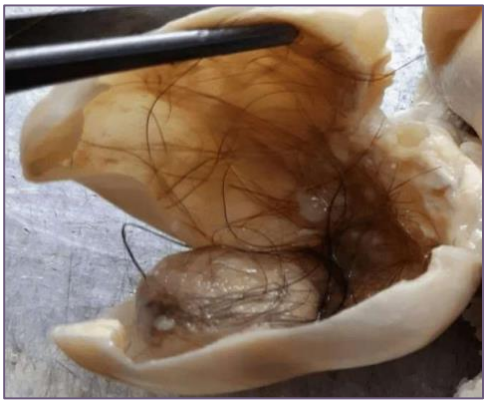
✤ Germ Cell Tumors ✤

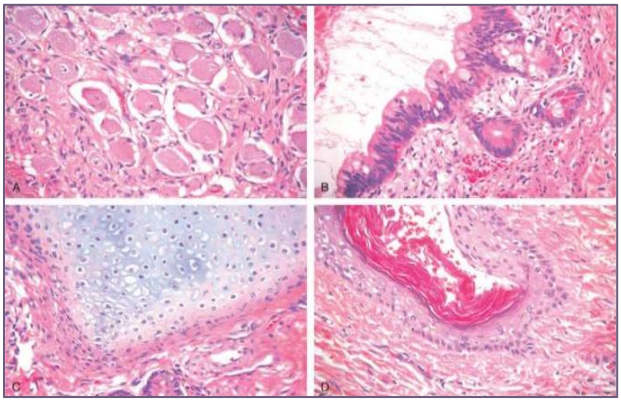
Types: (according to differentiation)

1. dysgerminoma (differentiation to oogonia)
2. Embryonal carcinoma (differentiation to primitive embryonal tissue)
3. yolk sac tumor (differentiation to endodermal sinus)
4. choriocarcinoma (differentiation to placental tissue)
5. Teratoma (differentiation to multiple tissue types).

❖ Benign (Mature) Cystic Teratoma:

- Totipotential germ cells form mature tissues of all three germ cell layers
- 15%-20% of ovarian tumors
- Many discovered incidentally
- 90% unilateral
- cyst filled with sebaceous secretion and hair; bone and cartilage; epithelium, or teeth.
- > 90% are benign mature cystic teratomas
- **immature** (malignant variant) is rare.
- torsion (10% to 15% of cases)





✤ Clinical correlation for all ovarian tumors ✤

- **Clinical presentation of all is similar:**
  1. Abdominal pain, gastrointestinal complaints, urinary frequency; rarely torsion producing severe abdominal pain mimicking an "acute abdomen."
  2. Ascites (in Fibromas and malignant serous tumors). Ascites is accumulation of excess fluid in the peritoneal cavity
  3. Functioning ovarian tumors : Estrogens or androgens.

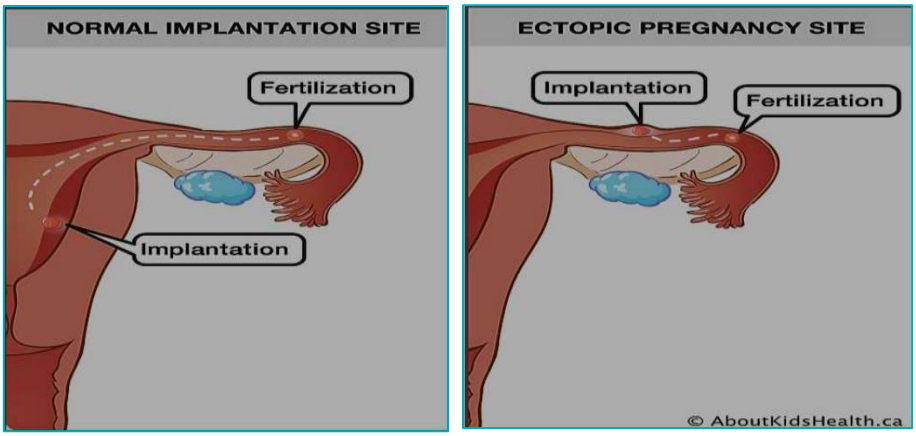
- **Treatment:**
  1. **Benign:** Surgical resection
  2. **Border line & Malignant tumors**: surgery + chemotherapy + radiotherapy
- Outcome of ovarian cancers remains unsatisfactory
- Malignant tumors are usually discovered in advanced stages
- survival minimally improved since 1970s.
- No early Screening methods are yet available

✤ Pathology of the Fallopian tubes ✤

✪ Ectopic pregnancy:

- implantation of the fertilized ovum outside uterus
- Incidence: 1%
- 90% of cases occur in fallopian tubes
- other sites: ovaries, abdominal cavity (very rare)
- Predisposing factors: tubal obstruction (50%) PID; tumors; endometriosis**; IUCD** اللولب ..
- In 50%: no anatomic cause can be demonstrated.
- **Normal Vs Ectopic pregnancy**:

  Early: development of embryo and placental tissue
  Later: placenta burrows through tubal wall causing intratubal hematoma (hematosalpinx) and intraperitoneal hemorrhage.
  Rupture: intense abdominal pain (acute abdomen), often followed by shock. **Prompt surgical intervention is necessary**



- Ectopic pregnancy management: opening the fallopian tube and removal of the sac **(salpingectomy**)

✪ Tubal malignancies:

- **most common histologic type is serous carcinoma.**
- may be the origin for many **ovarian** high-grade serous carcinomas
- **serous tubal intraepithelial carcinoma (STIC)** in fimbriated ends of fallopian tubes.
- STICs have **mutations in TP53 in 90% of cases**
- increased in women with **BRCA mutations**
- Because **of their access to peritoneal cavity**, fallopian tube carcinomas frequently spread to omentum and peritoneal cavity at time of presentation (advanced).

Past Papers?!
Test yourself here!
https://forms.gle/Y7nnBWkVvARQ48xw9

حَسْبِيَ اللهُ لا إِلَهَ إِلا هُوَ عَلَيْهِ تَوَكَّلْتُ وَهُوَ رَبُّ الْعَرْشِ الْعَظِيمِ