Pathology of the ovary

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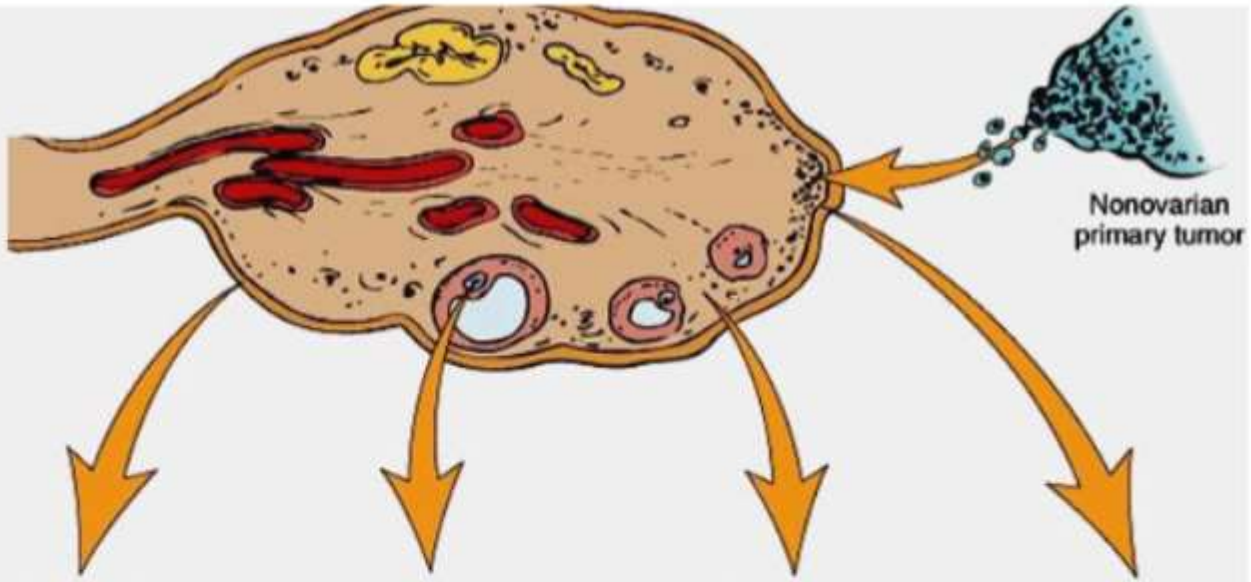
Ovarian Neoplastic Diseases

- 5th most common cancer in women.
- 5th leading cause of cancer death in women.
- 3 Origins of primary ovarian tumors:

1. **surface (coelomic) epithelium** (most frequent)
2. **germ cells** (affects children and young adults)
3. **sex cord/stromal cells.**

- Each of these cell types gives rise to a variety of tumors

Ovarian Neoplasms



ORIGIN	SURFACE EPITHELIAL CELLS (Surface epithelial–stromal cell tumors)	GERM CELL	SEX CORD–STROMA	METASTASIS TO OVARIES
Overall frequency	65%–70% (most frequent)	15%–20%	5%–10%	5%
Proportion of malignant ovarian tumors	90%	3%–5%	2%–3%	5%
Age group affected	20+ years	0–25+ years (affects children and young adults)	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	

Pathogenesis-familial cases

- Risk factors: **nulliparity** and **family history**.
- ?? use of OCPs may **reduce** risk. / oral contraceptive pills
- Only 5%-10% are familial
- Molecular pathogenesis: Mutations in **BRCA 1** and 2 **genes**

Pathogenesis- sporadic cases

- BRCA mutations: 10% of sporadic cases
- other important molecular pathways:
- **p53** (50%)
- **HER2/NEU** over-expression (35%)
- **K-RAS** protein over-expression (30%) (mucinous)

SURFACE EPITHELIAL TUMORS-types:

- 1- Serous
- 2- Mucinous
- 3- Endometrioid
- 4- Clear cell
- 5- Brenner

- All types include benign, borderline, and malignant tumors

1- Serous Tumors

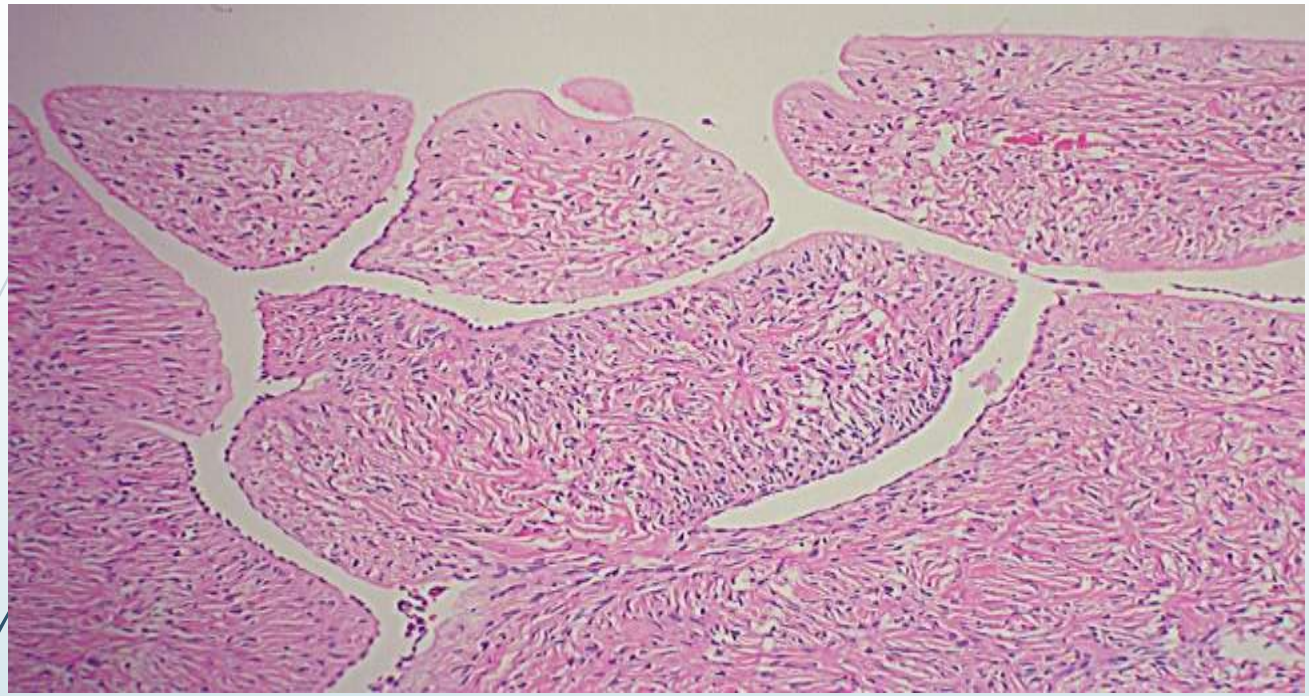
- **The most frequent ovarian tumors.**
- Include: 60% benign, 15% borderline, and 25% malignant.
- **The most common malignant ovarian tumors (60%)**
- Genetics:
- **BRAF** and **K-RAS** mutations→ borderline & low grade cancers
- **p53** and **BRCA1** mutations → High-grade serous carcinomas

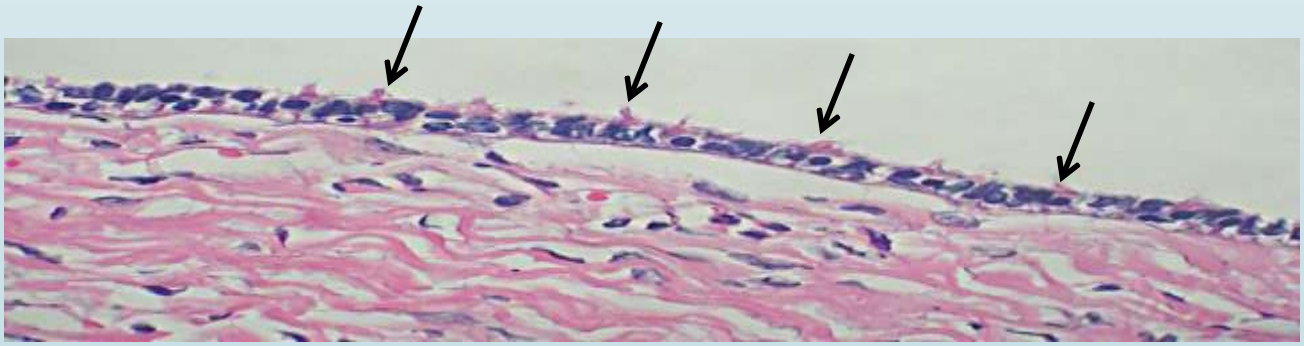
Morphology

- large cystic, (30 cm).
- May be bilateral.
- filled with a clear serous fluid
- **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

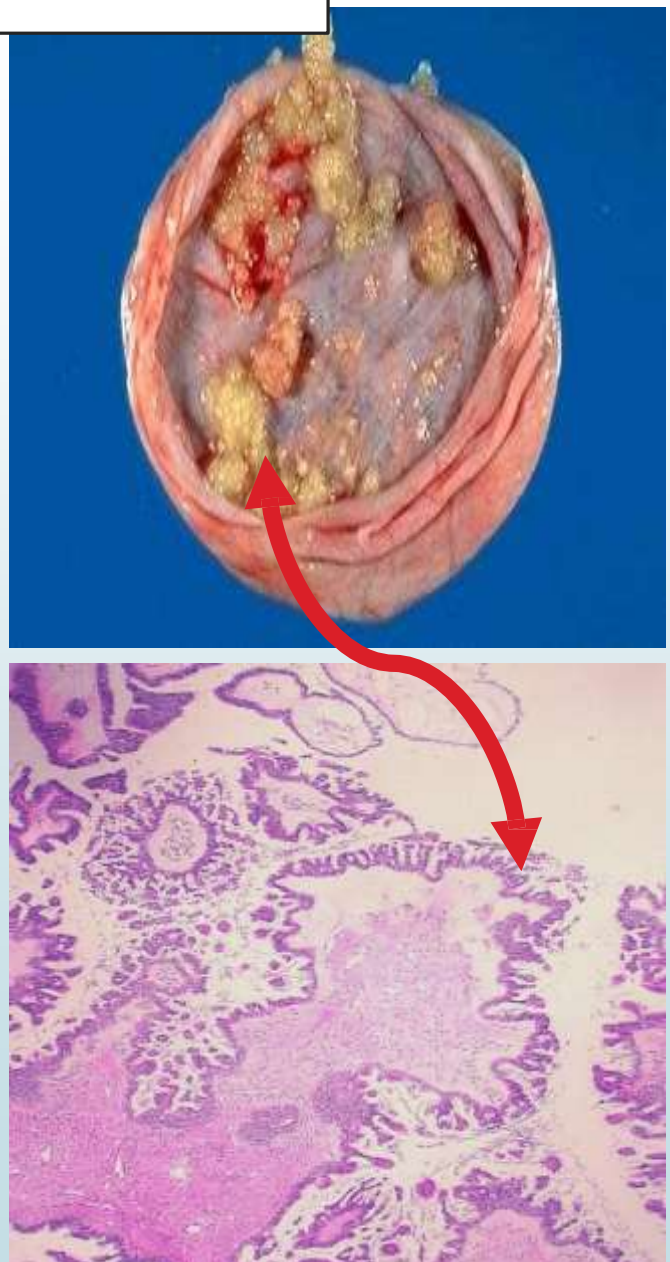
Benign serous tumors:



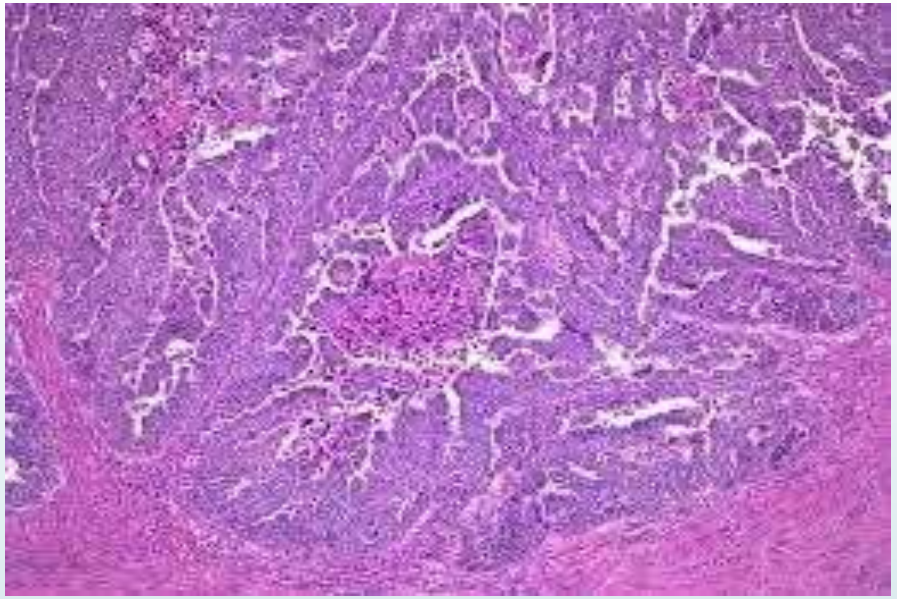


Border-line serous tumors

- more **complex architecture** / in histology so called papillary serous tumors
- mild cytologic atypia
- but **no** stromal invasion.
- might be associated with peritoneal implants
- Prognosis intermediate between benign and malignant types (survival with peritoneal metastases 75%)



Malignant serous carcinoma



Anaplasia of cells and invasion of the stroma.

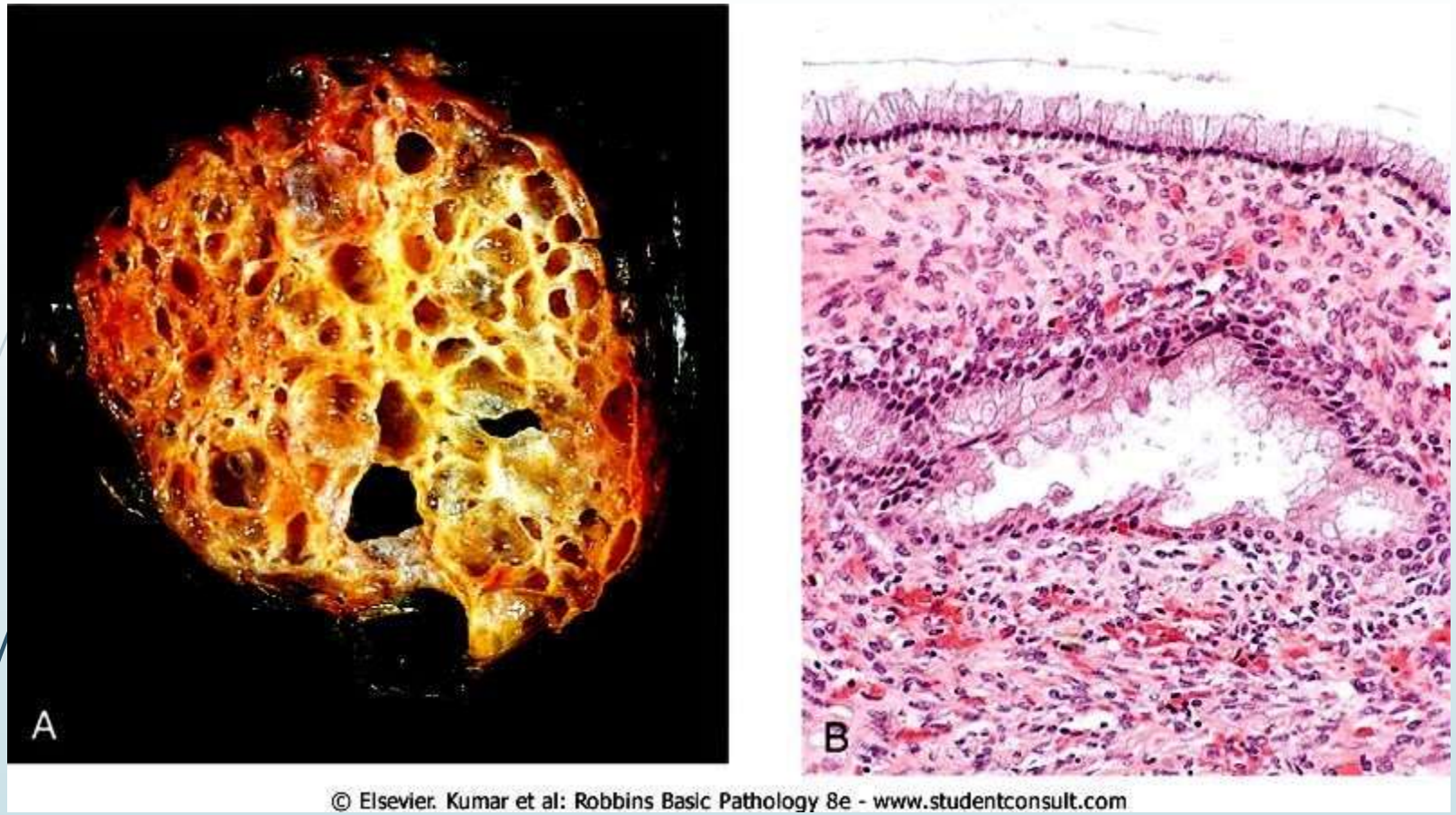
prognosis poor, depends on stage at the time of diagnosis.

- Has necrosis and mitosis.

2- Mucinous ovarian tumors

- **mucin-secreting** cells.
- Depending on the architectural complexity:
- 80% benign; 10% borderline; **10% malignant** (cystadenocarcinoma)
- **Usually large** and **multilocular**.
- psammoma bodies **not** found
- stage is major determinant of prognosis

Mucinous ovarian tumors

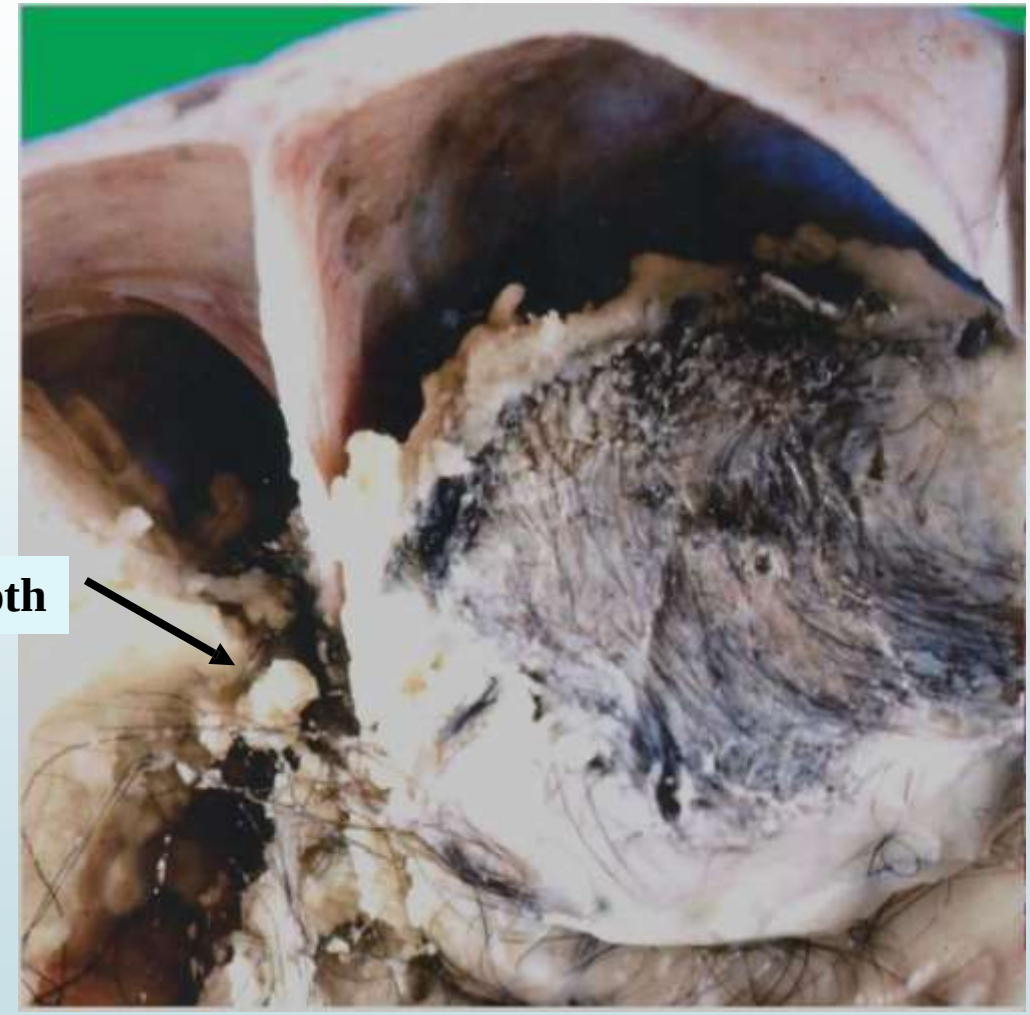


Histology: similar to GIT mucin producing cells (large bluish (due to mucin) cytoplasm

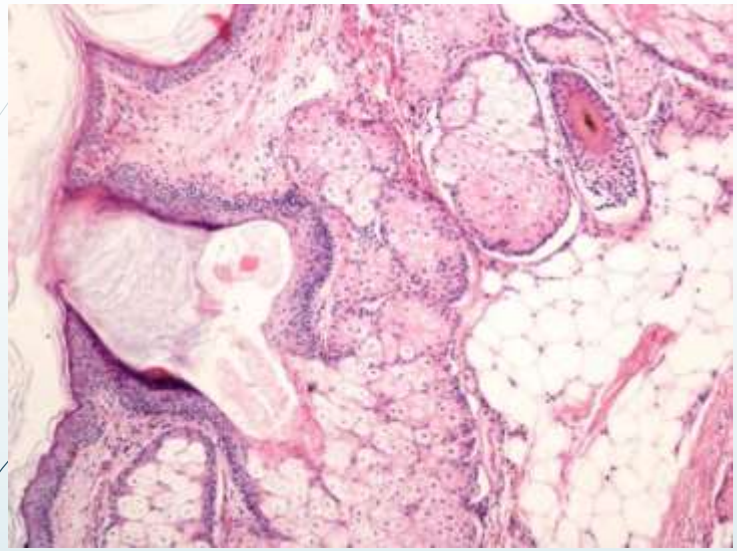
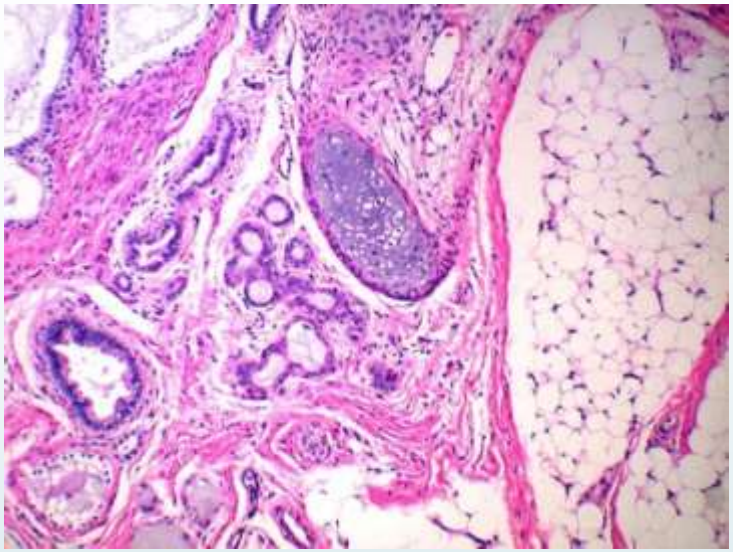
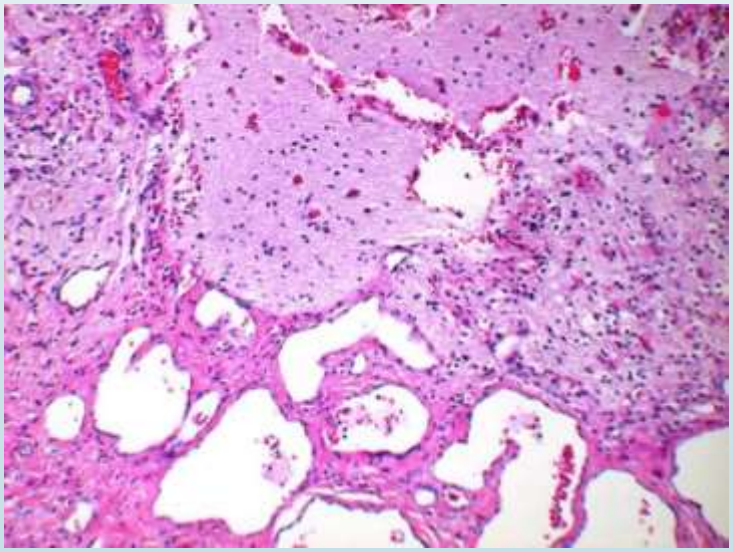
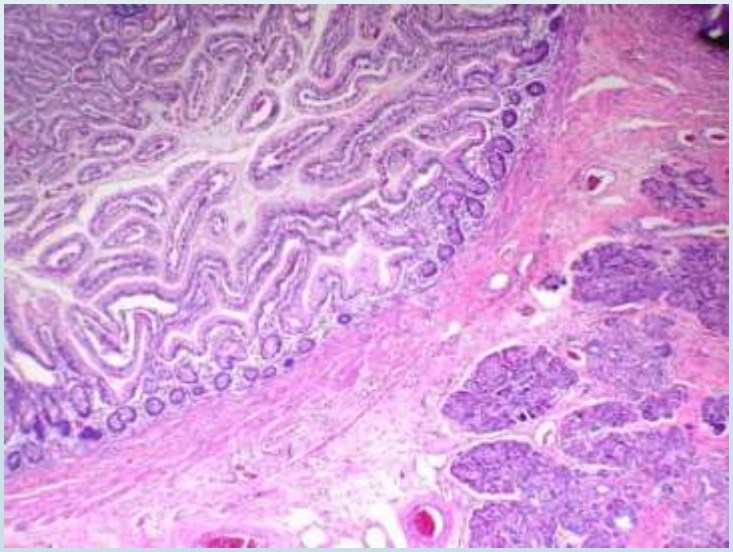
Germ cell tumors

- **Benign (Mature) Cystic Teratomas:**
- totipotential germ cells into mature tissues of all three germ cell layers
- Most discovered incidentally
- 90% unilateral
- Grossly: cyst filled with sebaceous secretion and hair; bone and cartilage; epithelium, or teeth./ Because germ cells can differentiate to many tissues.
- 1% → malignant transformation
- torsion (10% to 15% of cases)

Benign (Mature) Cystic Teratomas



Benign (Mature) Cystic Teratomas

Clinical Correlations for All Ovarian Tumors

- clinical presentation of all is similar:
- pain, gastrointestinal complaints, urinary frequency; rarely torsion producing severe abdominal pain mimicking an "acute abdomen."
- Ascites (in Fibromas / benign and malignant serous / mostly tumors).
- Functioning ovarian tumors often come to attention because of hormonal production (Estrogens or androgens).

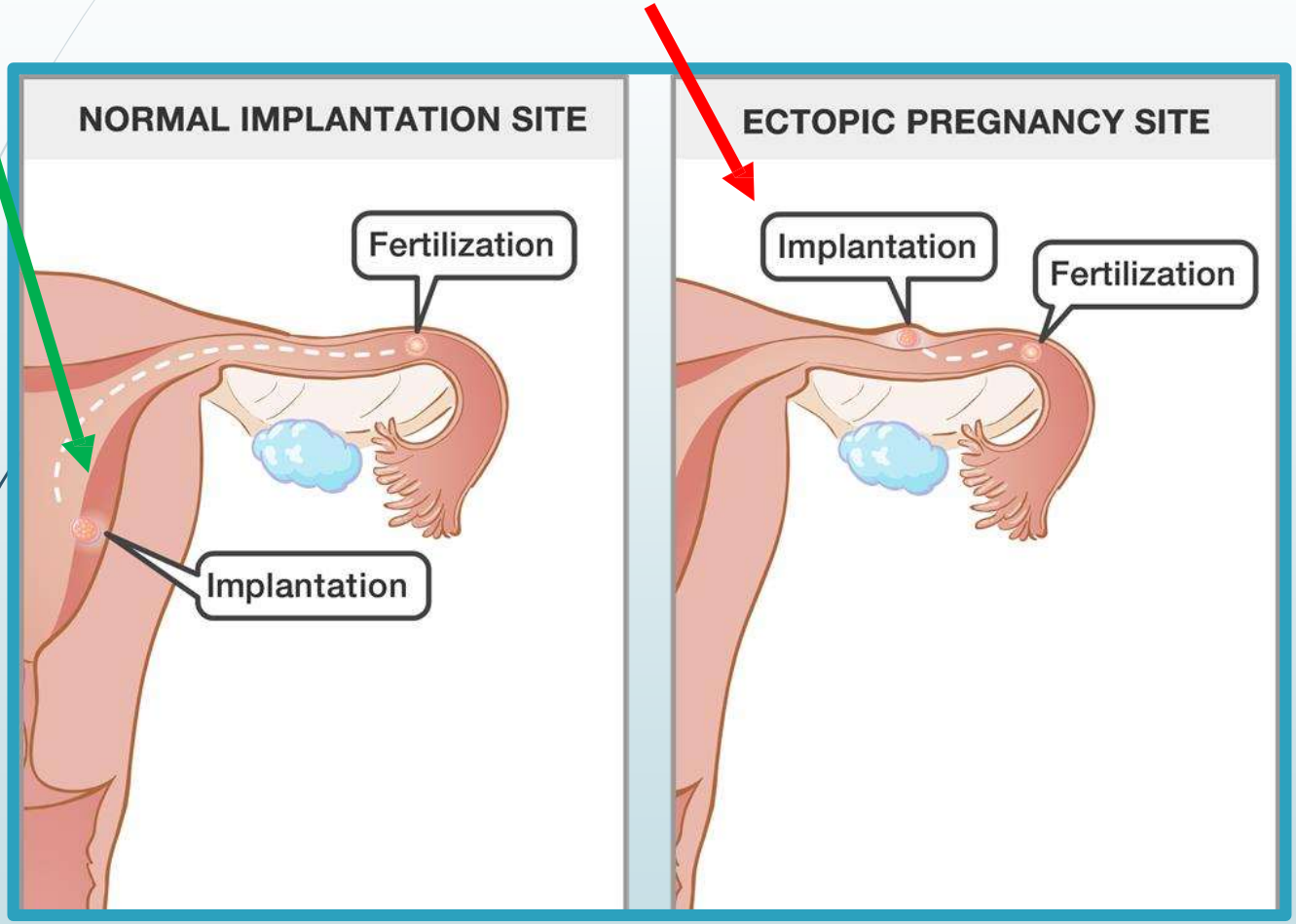
torsion (twisting of massing pressing on vascular supply causing necrosis)
Ascites (accumulation of fluid in peritoneal cavity)

Pathology of the Fallopian tubes

ECTOPIC PREGNANCY

- implantation of the fertilized ovum outside uterus
- Incidence: 1%
- 90% of cases → in fallopian tubes
- other sites: ovaries, abdominal cavity
- Predisposing factors: tubal obstruction (50%) PID; / pelvic inflammatory disease tumors; endometriosis; **IUCD**../ Intra-uterine Contraceptive Device
- In 50% : no anatomic cause can be demonstrated.

Normal versus ectopic pregnancy



ECTOPIC PREGNANCY

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

Ectopic pregnancy- Management

Tubal malignancies

- considered rare.
- **most common histo. type is serous carcinoma.**
- increased in women with **BRCA mutations** **(** In studies of prophylactic oophorectomies:10% →occult foci of malignancy in fimbria).
- Because **of access to peritoneal cavity**, fallopian tube carcinomas frequently spread to omentum and peritoneal cavity at time of presentation.

Thank you

Questions