

Pathology of the ovary

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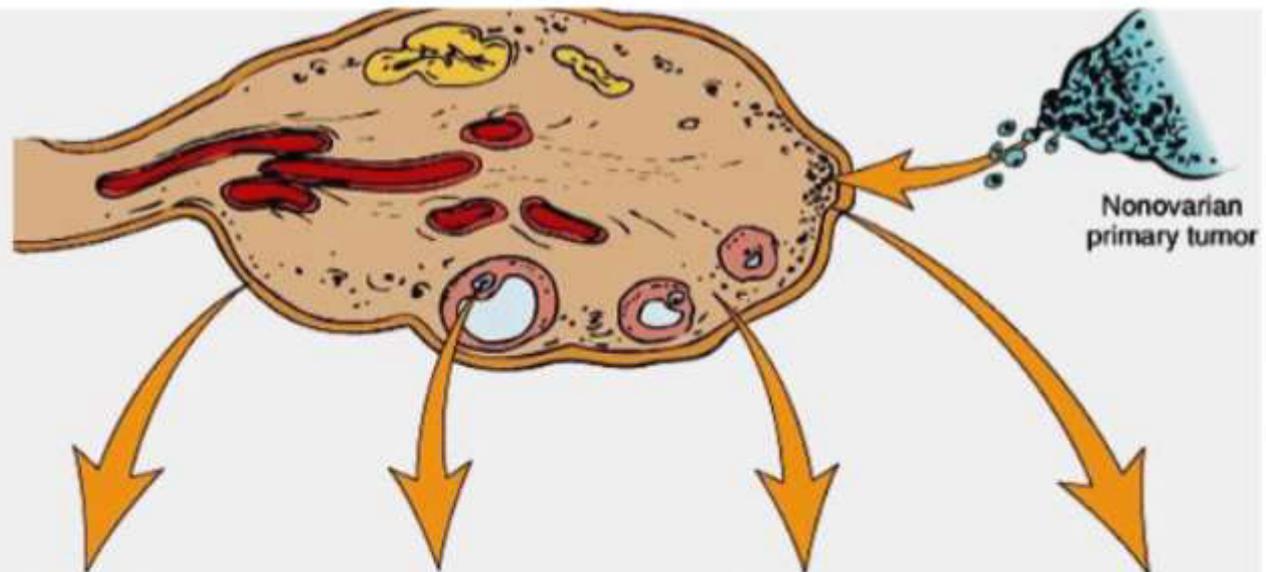
School of Medicine-Pathology Department
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Ovarian Neoplastic Diseases

- ▮ 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	Endometrium to the ovary
Types	<ul style="list-style-type: none"> • Serous tumor • Mucinous tumor • Endometrioid tumor • Clear cell tumor • Brenner tumor • Cystadenofibroma 	<ul style="list-style-type: none"> • Teratoma • Dysgerminoma • Endodermal sinus tumor • Choriocarcinoma 	<ul style="list-style-type: none"> • Fibroma • Granulosa-theca cell tumor • Sertoli-Leydig cell tumor 	Rare

Pathogenesis-familial cases

- Risk factors: **nulliparity** and **family history**.
- ?? use of OCPs may **reduce** risk. / oral contraceptive

pills

Due to the decrease in oestrogen

- Only 5%-10% are familial
- Molecular pathogenesis: Mutations in

BRCA 1 and 2 genes

All family will be affected even the male will have prostate cancer
And the female might also have breast cancer

Pathogenesis- sporadic cases

- ▣ BRCAs mutations: 10% of sporadic cases
- ▣ other important molecular pathways:
- ▣ p53 (50%) Can be presented in lymphoma
- ▣ HER2/NEU over-expression (35%)
- ▣ K-RAS protein over-expression (30%)
(mucinous)

SURFACE EPITHELIAL TUMORS-types:

Base on the histology and morphology

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

Like the transitional epithelium

- ▮ All types include benign, borderline, and malignant tumors

Mostly typical and better prognosis

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**

Mostly unilateral

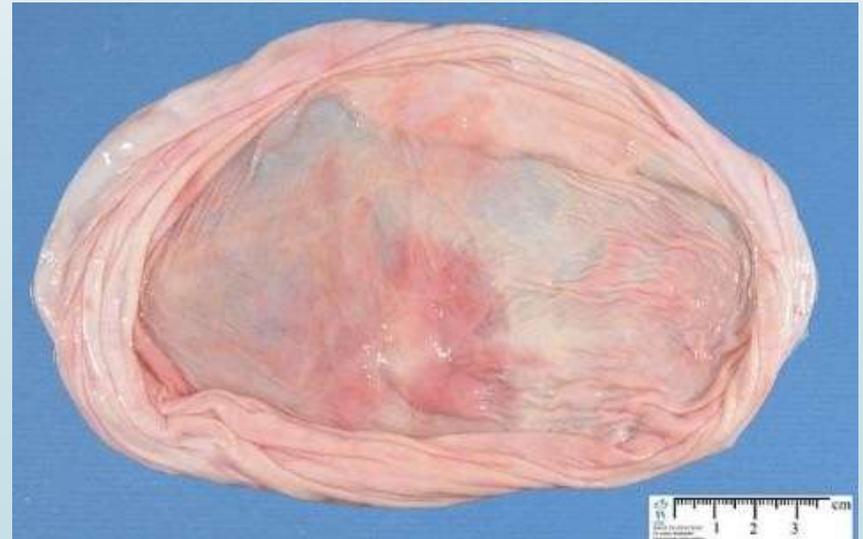
Morphology

- large cystic, (30 cm). Mucinous have larger size
- 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

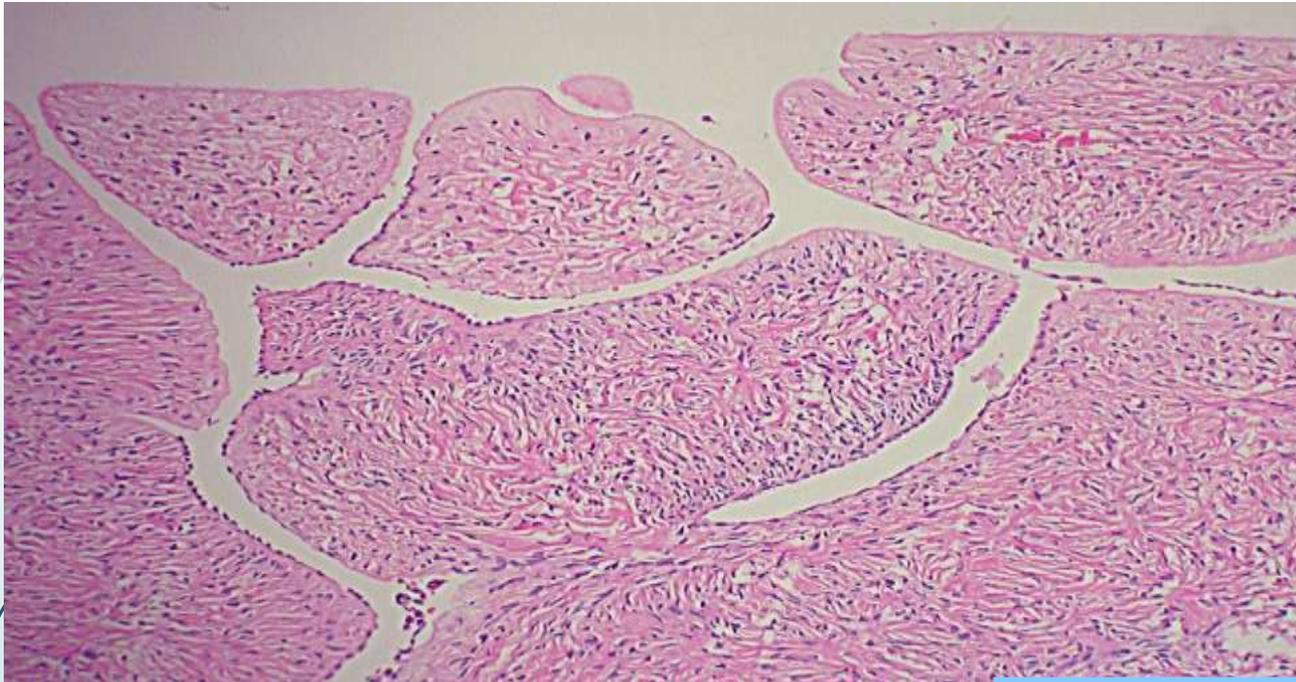


Smooth
Regular
Well lined
Can be diagnosed benign by the eye



Benign serous tumors:

Low power



Single layer of columnar ciliated epithelium

High power



The malignant will be more than one layer

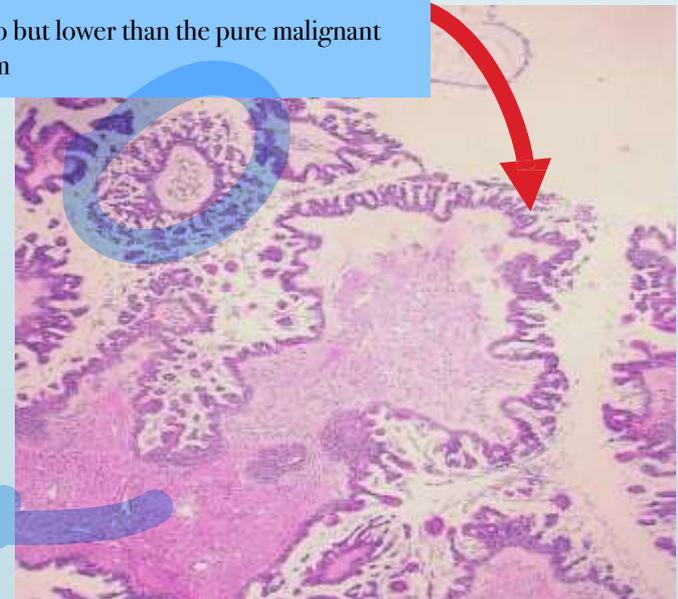
Border-line serous tumors

- 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%)

May transfer from the high or low grade



Detached epithelium
مش مرتبطين مع ال
More atypical
High NC ratio but lower than the pure malignant
Polymorphism

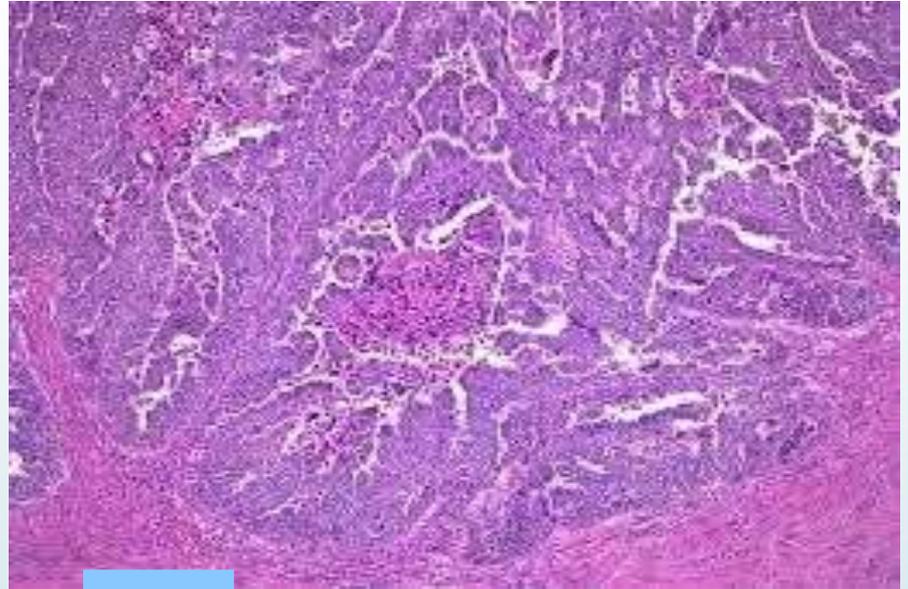


Stroma

Malignant serous carcinoma

Anaplasia of cells
and invasion of
the stroma.

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



Necrosis
Mitosis
Anaplastic

عشان تكون malignant لازم ال stroma will be invasive

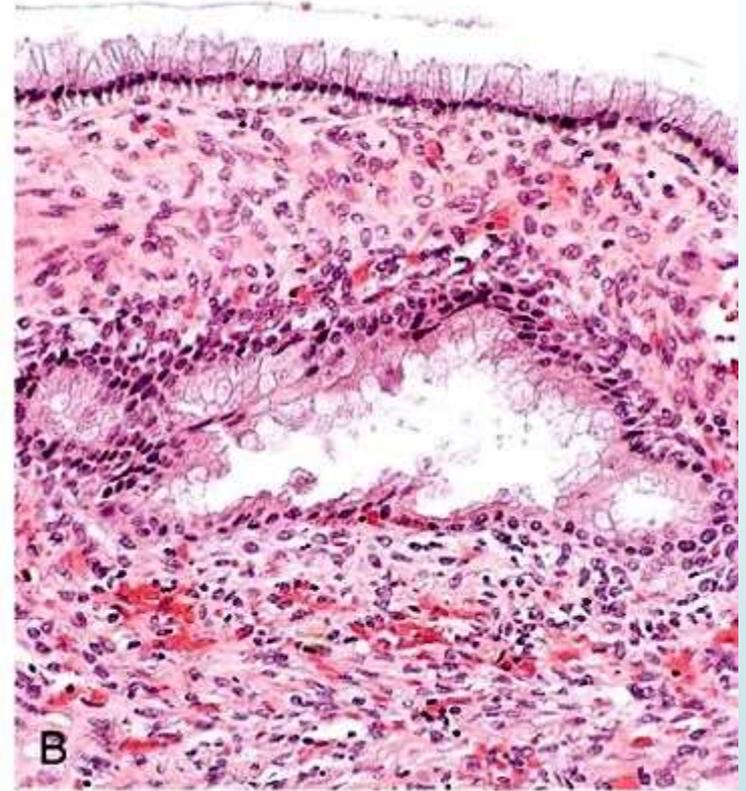
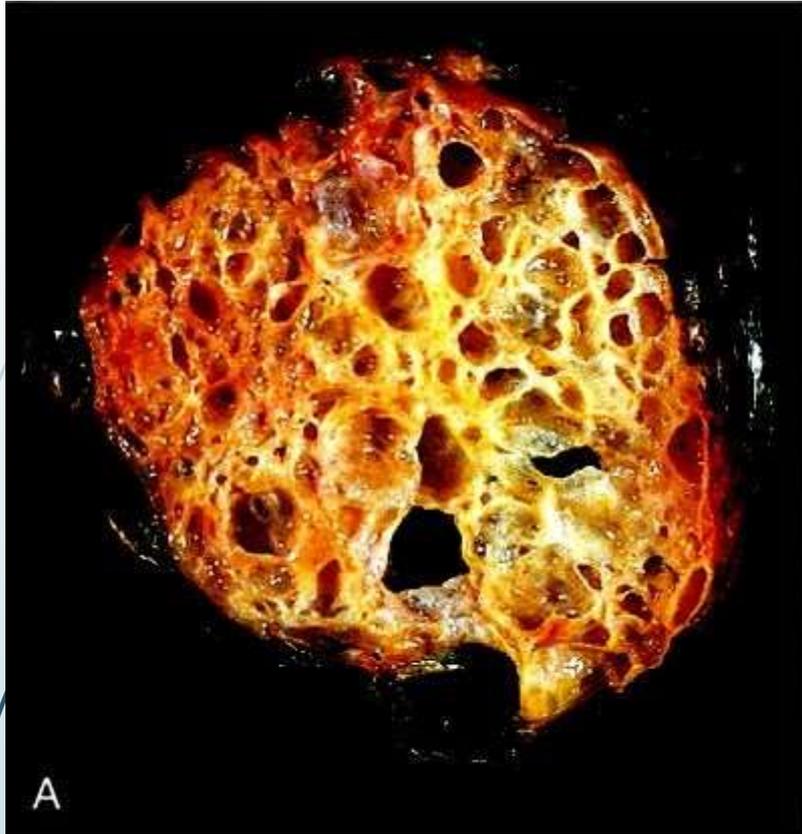
- Has necrosis and mitosis.

2- Mucinous ovarian tumors

- **mucin-secreting** cells.
- Depending on the architectural complexity:
- 80% benign; 10% borderline; **10% malignant**
(cystadenocarcinoma)
- **Usually large and multilocular.** Might reach 15 kilo
- **psammoma bodies not found**
- stage is major determinant of prognosis

In cancer the stage is more important than the grade

Mucinous ovarian tumors



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

Apical mucin

Germ cell tumors

Tumor of the mid line in all 3 layers

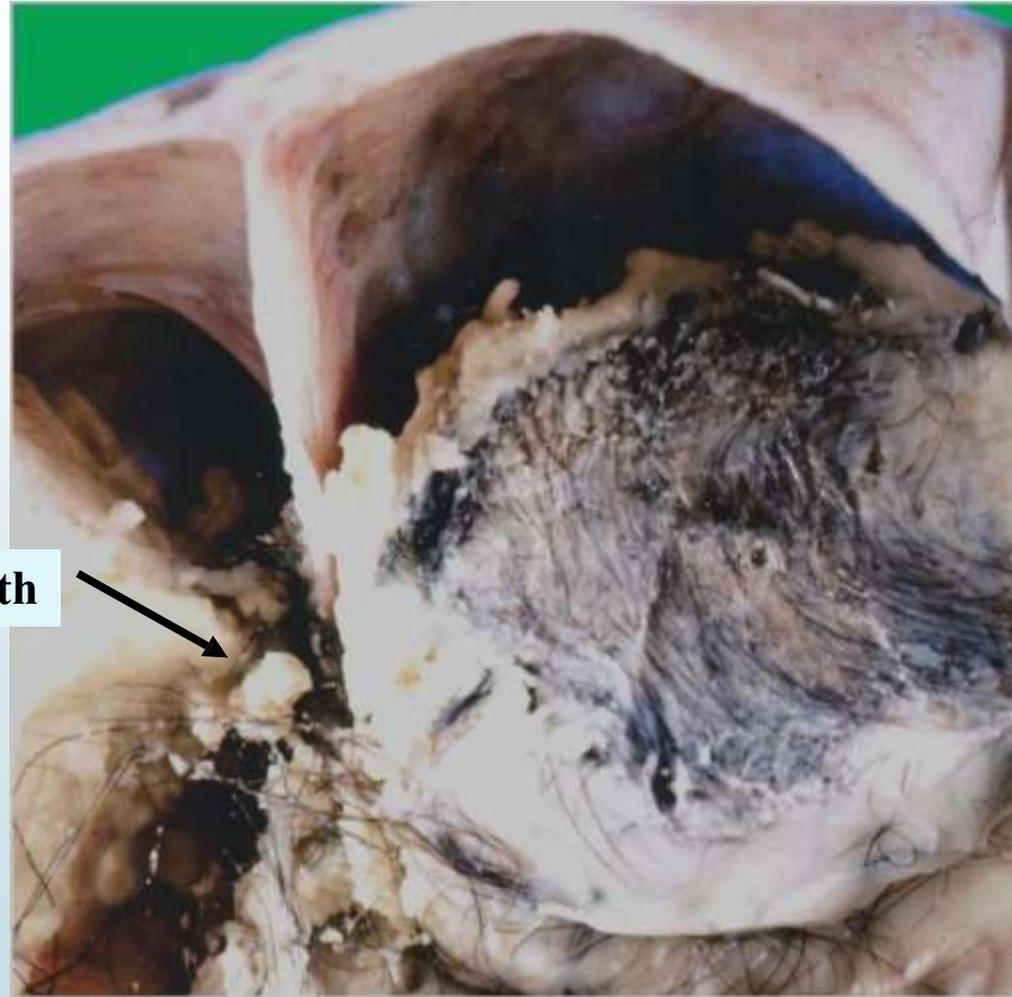
Teratoma might be malignant

- ▣ **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)

Depending on the epithelial like squamous or epithelial

Might rupture

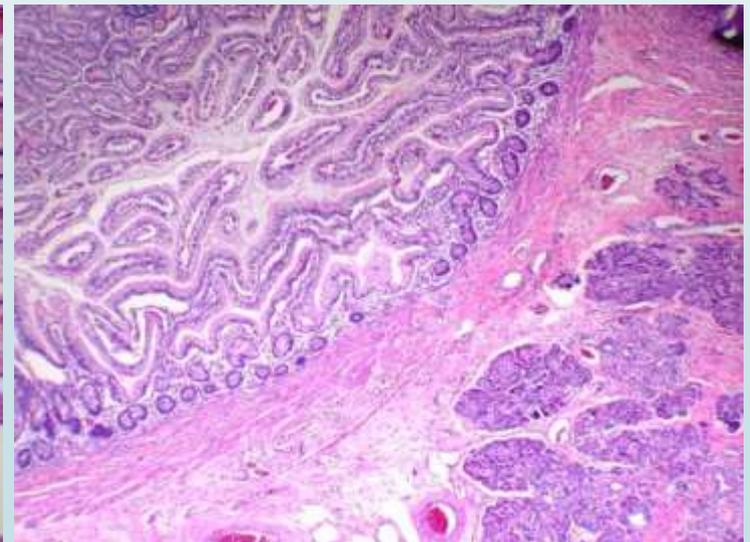
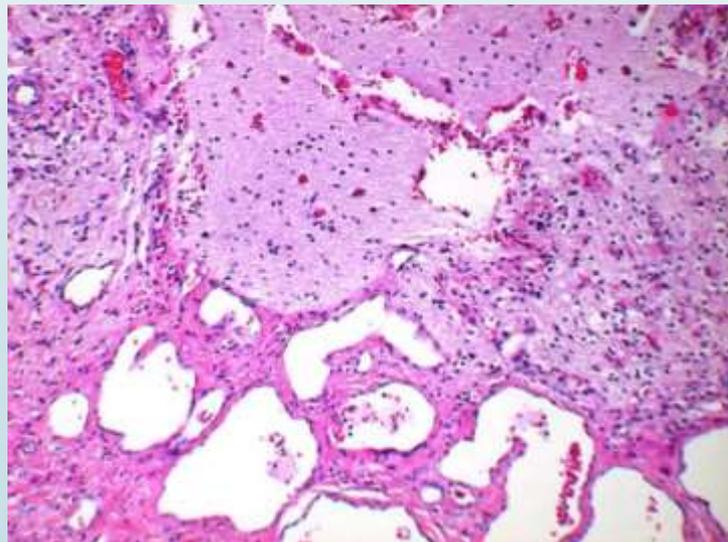
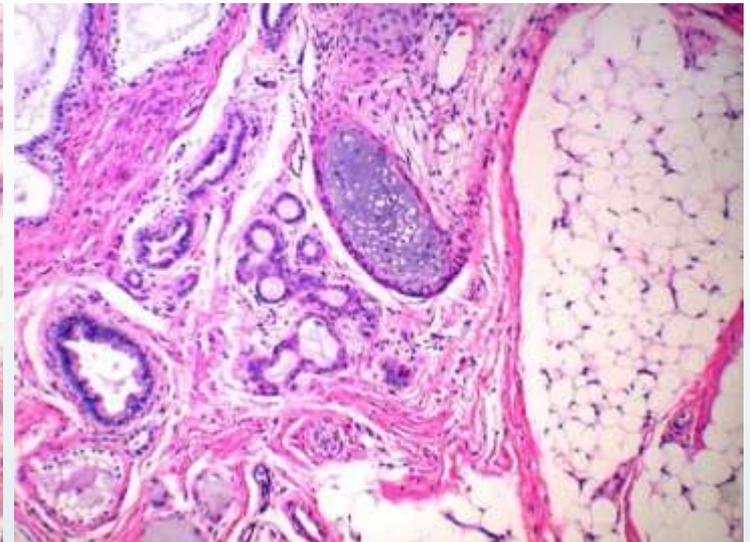
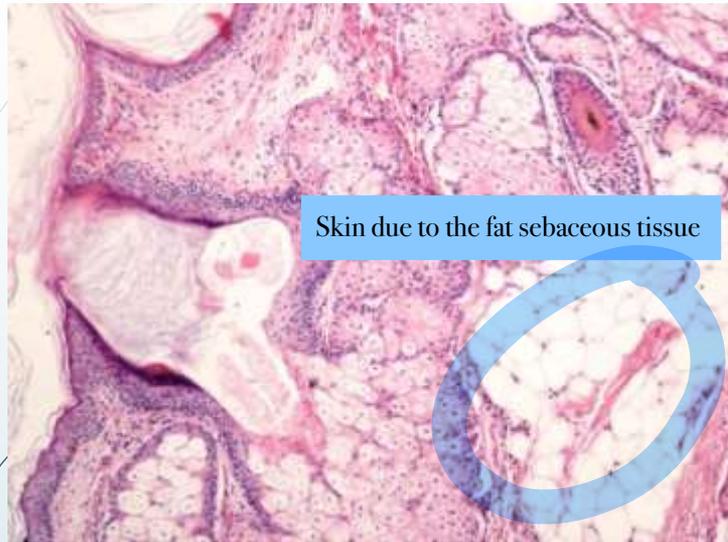
Benign (Mature) Cystic Teratomas



tooth

Not blastic; if small will be immature

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

الحمل خارج بالرحم

Outside endometrium cavity

- ❑ 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; tumors; endometriosis; IUCD.. / Intra-uterine Contraceptive Device
- In 50% : no anatomic cause can be demonstrated.

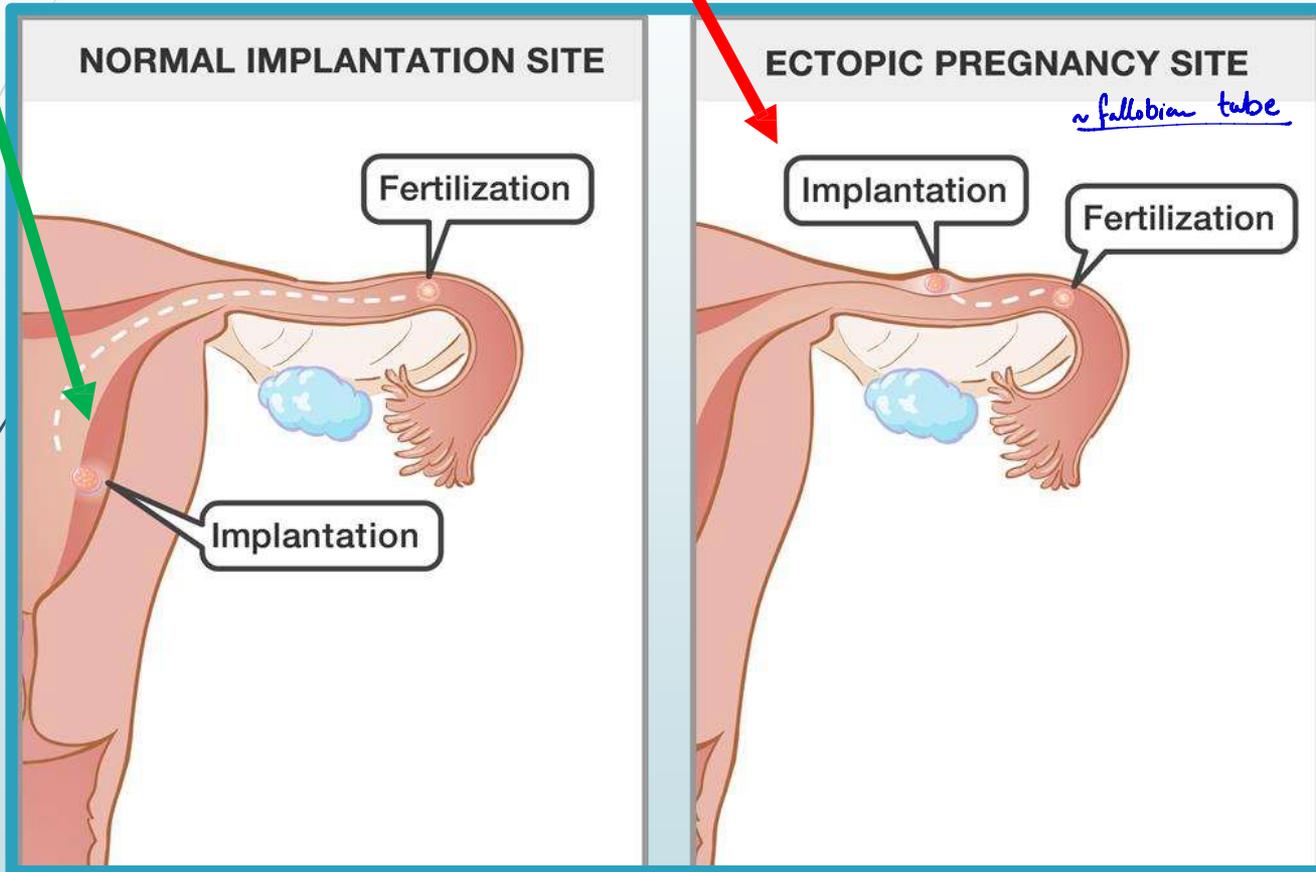
/ pelvic inflammatory disease

appendix, abdominal cavity.

موانع الحمل.

وإذا لم
يصل إلى
Endometrium
في الرحم
في مكان الحمل

Normal versus ectopic pregnancy



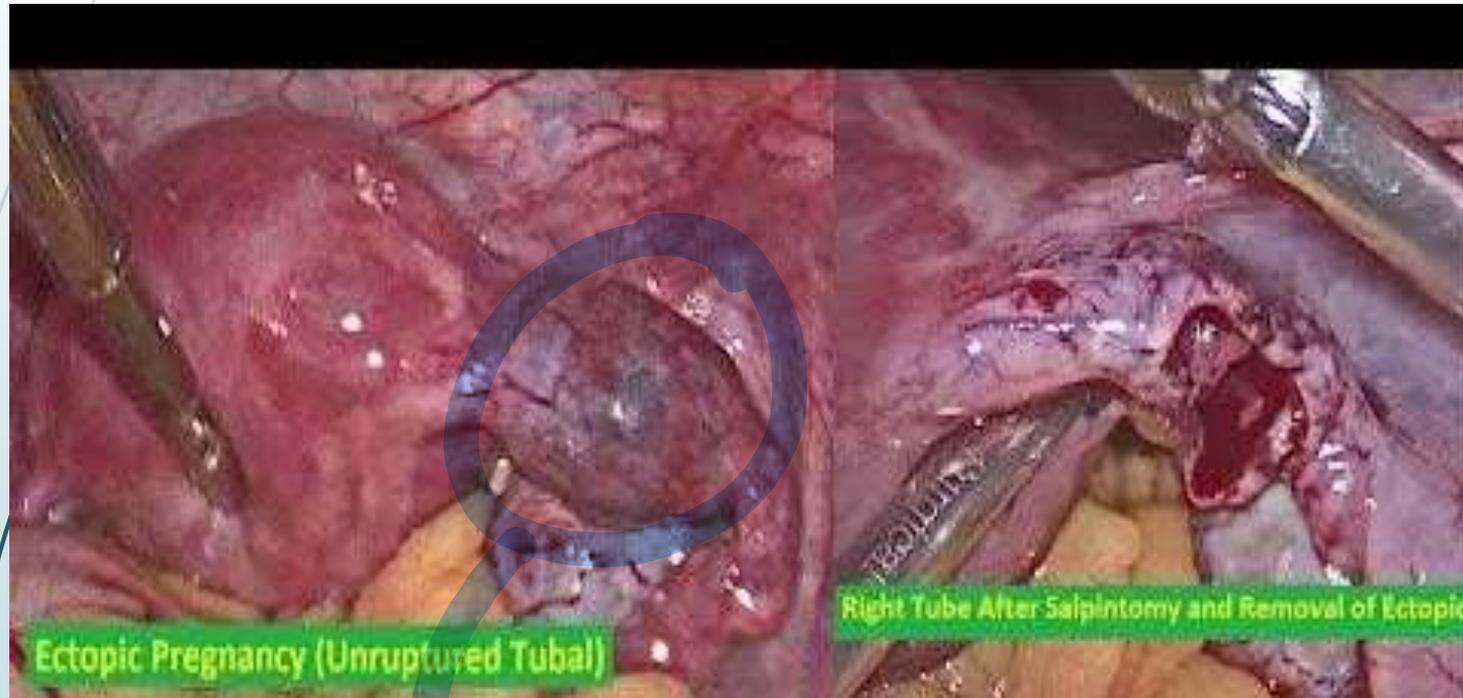
ECTOPIC PREGNANCY

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

لازم 2 من المينات (Biopsy) لل:

- Uterus
- Tube

Ectopic pregnancy- Management



ECTOPIC Pregnancy
Rupture, Bleeding

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.**