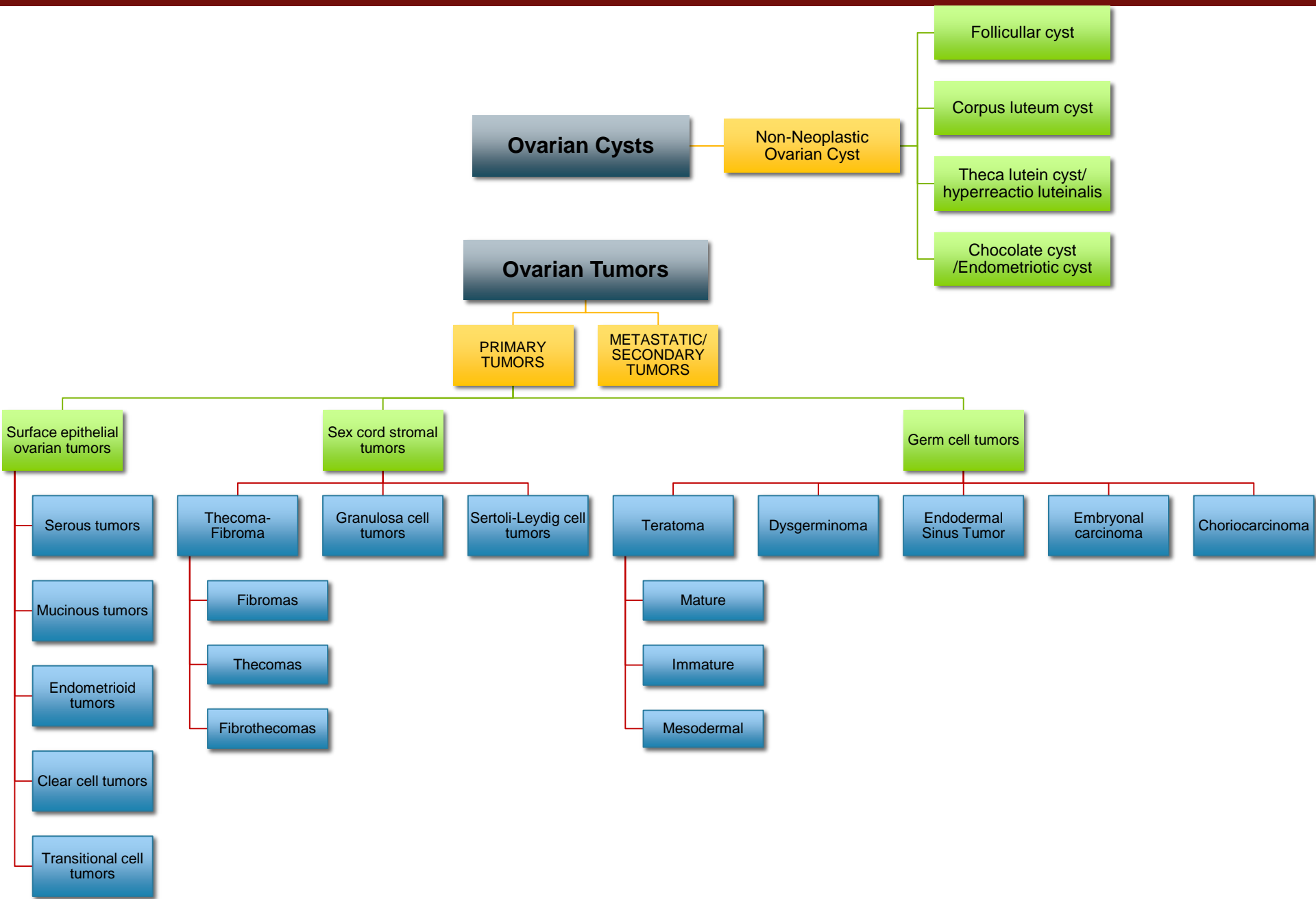


Lecture 3: Ovarian Cysts & Ovarian Tumors

■ Important

■ Notes

■ Explanation



Ovarian Cysts

- Non neoplastic cysts are common but they are not serious problems.
- Inflammation of ovaries is **rare**. It is usually associated with **salpingitis of fallopian tubes (Salpingo-Oophoritis)**.
- Frequently, the ovaries affected by endometriosis.
- The most important medical problems in ovaries are the neoplasms.
- Death from ovarian cancers is **more** than that of cervix and uterus together.
- Ovarian tumors grow **silently**, which make them so dangerous.



A. Non-Neoplastic Cysts of Ovary

- Non-Neoplastic Cysts are **more common** than the neoplastic ones.
- They usually **cause no problems**. Rarely a non neoplastic cyst can rupture and cause acute pain and intrabdominal hemorrhage.
- Common non neoplastic cysts are as follows:

Follicular Cyst	Corpus Luteum Cyst	Theca Lutein Cyst / Hyperreactio Luteinalis	Chocolate Cyst /Endometriotic Cyst
<ul style="list-style-type: none"> • Arise from the ovarian follicles. • Due to distension of un-ruptured Graafian follicle. 	<ul style="list-style-type: none"> • Results from <u>hemorrhage</u> into a persistent mature corpus luteum. 	<ul style="list-style-type: none"> • Thin walled and lined by luteinized theca cells. • Associated with high levels of circulating gonadotropins (e.g. pregnancy, hydatidiform mole, etc). 	<ul style="list-style-type: none"> • A blood containing cyst resulting from <u>endometriosis</u> with <u>hemorrhage</u>. • The ovary is the most frequent site of endometriosis.

Ovarian Tumors

- Fifth leading cause of cancer death in women.
- Ovarian cancers grow **silently** and go undetected in the early stage when it is still curable. Most of the patients already have metastasis at the time of diagnosis.
- The WHO Histological Classification for ovarian tumors divides ovarian neoplasms into **primary** and **metastatic** (secondary).

Ovarian Tumors Classification

A. Primary Tumors

- There are three main primary types of ovarian tumors based on the origin of the tumor cell. They are:

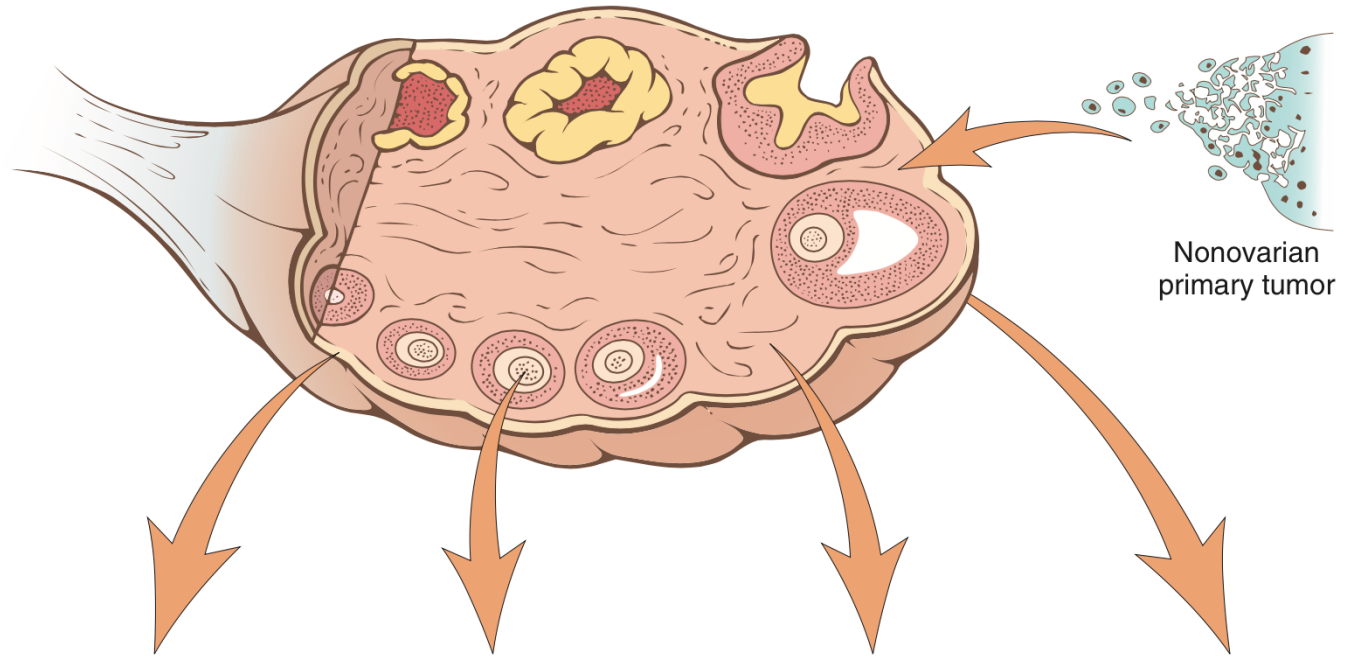
1- Surface Epithelial Ovarian Tumors (65%):	2- Germ Cell Tumors (15%):	3- Sex Cord Stromal Tumors (10%):
<ul style="list-style-type: none">• Derived from the cells on the surface of the ovary.• The most common form of primary ovarian cancer and occurs in adults.	<ul style="list-style-type: none">• Derived from the egg producing cells of the ovary, i.e. from the ovarian follicles.• Occurs mainly in children, teens and young women.• It is rare by comparison to epithelial ovarian tumors.	<ul style="list-style-type: none">• Derived from the ovarian stroma.• Also rare in comparison to epithelial tumors.• This class of tumors often produces steroid hormones.

B. Metastatic/ Secondary Tumors (5%)

Cancers from other organs can also spread to the ovaries.

Risk Factors :

- Null parity
- Gonadal Dysgenesis
- Family History
- Ovarian cancer genes :
BRCA1 (17q12) & BRCA2 (13q12)
(Cancer suppressor, Breast & ovary)



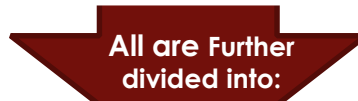
ORIGIN	SURFACE EPITHELIAL CELLS (Surface epithelial-stromal cell tumors)	GERM CELL	SEX CORD-STROMA	METASTASIS TO OVARIES
Overall frequency	65%–70%	15%–20%	5%–10%	5%
Proportion of malignant ovarian tumors	90%	3%–5%	2%–3%	5%
Age group affected	20+ years	0–25+ years	All ages	Variable
Types	<ul style="list-style-type: 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 	

1st: Surface Epithelial Ovarian Tumors

- Neoplasms of surface epithelium account for majority of all primary ovarian tumors.
- Are 65 – 70 % of overall tumors
- They account for 90 % of malignant tumors in the ovary
- Age 20+

Subdivision of surface epithelial ovarian tumors

1-Serous Tumors	2-Mucinous Tumors	3-Endometrioid Tumors	4-Clear cell Tumors	5-Transitional/Brenner cell Tumors
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Benign	Borderline <i>*also called intermediate/ tumors of low malignant potential</i>	Malignant
<i>They do not spread and invade other tissues</i>	<i>this is a gray zone. They are 'semi-malignant'. These appear to be low grade cancers with limited invasive potential. They have better prognosis than malignant. These tumors may seed or implant into the peritoneum</i>	<i>are carcinomas and have potential to metastasize beyond the ovary</i>



<ul style="list-style-type: none"> • Benign (cystadenoma) • Borderline tumors (serous borderline tumor) • Malignant (serous adenocarcinoma) 	<ul style="list-style-type: none"> • Benign (cystadenoma) • Borderline tumors (mucinous borderline tumor) • Malignant (mucinous adenocarcinoma) 	<ul style="list-style-type: none"> • Benign (cystadenoma) • Borderline tumors (endometrioid borderline tumor) • Malignant (endometrioid adenocarcinoma) 	<ul style="list-style-type: none"> • Benign • Borderline tumors • Malignant (clear cell adenocarcinoma) 	<ul style="list-style-type: none"> • Brenner tumor • Brenner tumor of borderline malignancy • Malignant Brenner tumor • Transitional cell carcinoma (non-Brenner type)
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1- Surface Epithelial Ovarian Tumors (Serous Tumors)

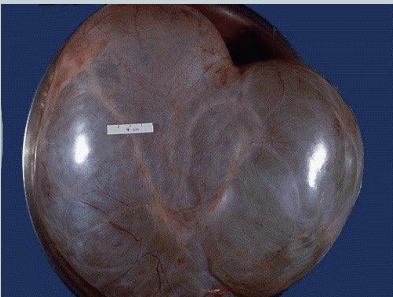
Serous ovarian tumors are the **most common** type **ovarian tumors**. They are also the **most common** group of **epithelial tumors**. The tumor cells are of serous nature.

- Age is **30 - 40**.
- Usually cystic filled **with clear serous fluid**.
- Serous tumors are often **bilateral**.
- **Psammoma bodies** are commonly seen in malignancy.

Subdivision of Serous tumors

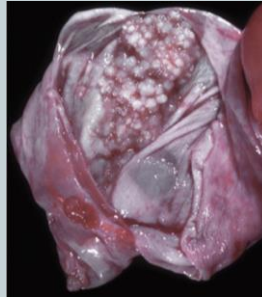
Benign serous tumors
(60%)
Also called cystadenomas

- ✦ Commonly large.
- ✦ Cystic.
- ✦ **Thin-walled**.
- ✦ **Unilocular**.
- ✦ Lined by serous cells and contain thin, **clear yellow fluid**.



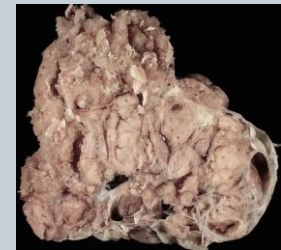
Borderline serous tumors
(15%)

- ✦ Cystic
- ✦ Thin wall and smooth surface.
- ✦ Often have multiple papillary excrescences (**grape-like clusters**), protruding into the lumen in places.



Malignant serous tumors
(25%).
Also called cystadenocarcinoma

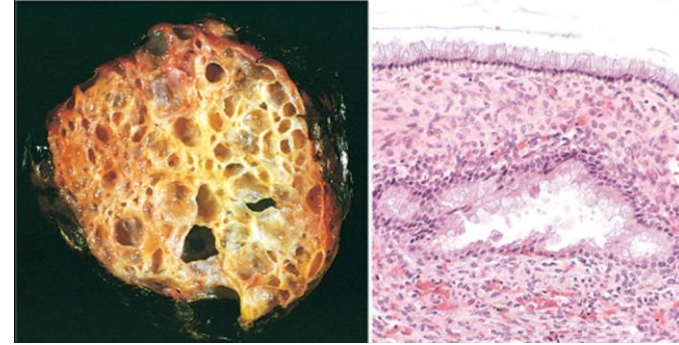
- ✦ The **commonest malignant ovarian tumor**, forming about a third of all cancers of the ovary.
- ✦ The tumors are **partly cystic and partly solid with prominent excrescences**.
- ✦ **With necrosis and hemorrhage**.
- ✦ Usually present **with ascites** due to abdominal metastases.
- ✦ **Treatment:** surgery, chemotherapy and radiotherapy.
- ✦ **Prognosis:** **poor**



2- Surface Epithelial Ovarian Tumors (Mucinous Tumors)

Mucinous tumors form about 25% of all ovarian neoplasms. The tumor cells are mucin-producing cells.

- Less likely to be malignant.
- 80% are benign.
- 10% are borderline.
- 10% malignant.
- Bilaterality is uncommon.
- Mucinous tumors can be very large.
- They are typically cystic and multilocular and filled with thick sticky, viscous mucoïd fluid.
- Pseudomyxoma peritonei.



3- Surface Epithelial Ovarian Tumors (Endometrioid tumors)

- They have tubular gland that resemble the endometrium, so the name endometrioid (endometrium-like).
- Endometrioid tumors form 10 to 20% of all ovarian tumors.
- Most of the endometrioid tumors are malignant (carcinomas).
- **Some** endometrioid tumors are accompanied by an endometrial carcinoma in the uterus and / or endometriosis in the ovaries.

4- Surface Epithelial Ovarian Tumors (Transitional cell/ brenner tumor)

- Tumor cell are transitional cell type.
- Most are benign.

2nd: Sex Cord-Stromal Tumors

classification:

1-Thecoma-Fibroma:

It is further divided into: Thecoma (pure), Fibroma (pure) and Fibrothecoma (mixture of both). *Always benign.*

2-Granulosa Cell tumor

3-Sertoli-Leydig cell tumor.

} With Malignant Potential

1-Thecoma-Fibroma

- * Any age
- * Unilateral, solid, vary in color from white to yellow
- * Almost always benign. Very rarely malignant.
- * Pure theca cell & FibroThecoma tumors produce estrogen
- * Fibromas are whiter, harder with whorled cut surface and do not produce estrogen except when mixed with thecomas.
- * About 40% cases are associated with ascites and hydrothorax called as **Meig's Syndrome**.



2-Granulosa Cell Tumor

- Unilateral, solid and cystic
- Produce estrogen
- Can be associated with endometrial hyperplasia and carcinoma
- About 5 to 25% show malignant behavior

↓ Clinical Presentation:

abnormal vaginal bleeding

❖ Divided into 2 forms:

1. Adult form: more common in postmenopausal women.
2. The juvenile form: is seen in the first 30's, can present with isosexual precocity.

3- Sertoli-Leydig Cell Tumor

- All ages
- Unilateral yellowish solid tumor.
- Rare tumors of low malignant potential
- Produces androgens

↓ Clinical Presentation:

1. Virilization (in 1/3 of cases).
2. Oligomenorrhea, amenorrhea.
3. Loss of female secondary sex characteristics.
4. Hirsutism.
5. Clitoromegaly.
6. Deepening of voice.

3rd: Germ Cell Tumors

Classifications: (all are considered malignant except Mature Teratoma)

1- Teratoma:

Mature (benign)

- Solid

- Cystic (dermoid cyst)

Immature

Monodermal (e.g., struma ovarii, carcinoid)

2- Dysgerminoma

3- Endodermal sinus Tumor (Yolk sac tumor)

4- Embryonal carcinoma

5- Choriocarcinoma

6- **Mixed germ cell tumors:** a mixture of germ cell tumors occurring together in one tumor mass

1- Teratoma:

- * **15-20 %** of ovarian tumors. Majority in their first 20's.
- * The tumors are subdivided into mature, immature and monodermal.
- * Mature cystic teratoma are **the most common**. They are benign.
- * **Immature** teratomas are malignant and **rare**.
- * The **younger** the patient, the greater the likelihood of **malignant** behavior.

Teratoma: (Cont.)

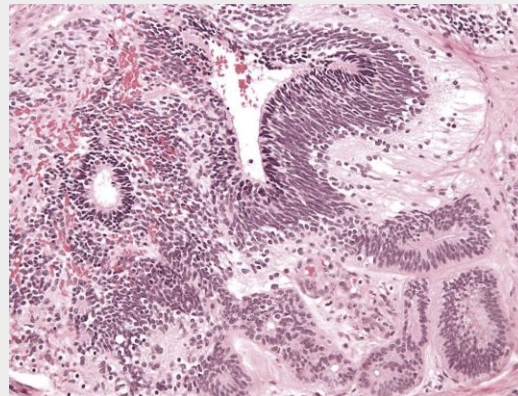
A- Mature Teratoma (Cystic)

- * It is **the most common** ovarian germ cell tumor and the most common type of ovarian teratoma.
- * **Benign neoplasm** that typically occurs during reproductive years **composed of** mature elements of the ectoderm, endoderm and mesoderm
- * Cystic tumor, filled with sebaceous material and hair and occasionally teeth.
- * **Histology:** skin, hair, sebaceous glands, and mature neural tissue predominate; cartilage, bone, respiratory and intestinal epithelium are common.
- * **Complications** include torsion, rupture, infection etc.



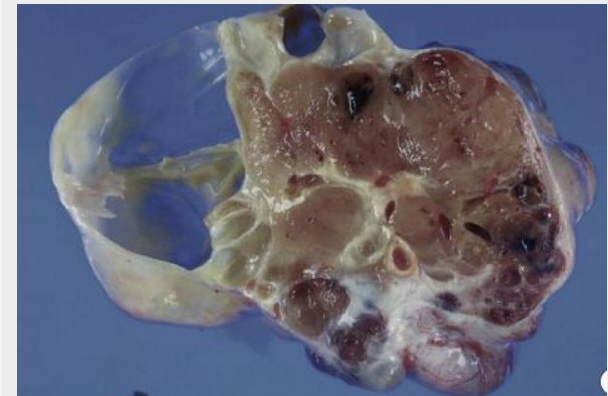
B-Immature Teratoma

- * Malignant neoplasms
- * Occurs **in children and young adults**
- * Usually a unilateral, solid tumor
- * Similar to mature teratoma but in addition they contain immature or embryonal tissues especially immature neuroepithelium.
- * **They are graded based on the amount of immature tissue.**



C- Monodermal Teratoma

- Composed predominantly of one tissue element
- Most common type is "**struma ovarii**", which is mature thyroid tissue.
- The thyroid tissue can sometimes become malignant.
- **Sometimes a carcinoid tumor can arise from it.**



3rd: Germ Cell Tumors (Cont.)

2- DYSGERMINOMA

- Uncommon.
- Between **10 to 30yrs** of age.
- Unilateral and solid mass.
- Highly sensitive to radiation therapy.
- Microscopically look exactly like its counterpart in testis (Seminoma) and brain (germinoma).
- All malignant.
- **PLAP positive.**

3- ENDODERMAL SINUS TUMOR

- Also known as yolk sac tumor.
- **Under 30** years of age.
- Can be pure or a component of a mixed germ cell tumor.
- It is **radioresistant** but responds to combination chemotherapy.
- It is associated with elevated serum a-fetoprotein and a1-antitrypsin.
- Its characteristic histologic feature : **Schiller-Duval bodies.**
- **stained for a-fetoprotein.**

4- EMBRYONAL CARCINOMA

- Rare, aggressive, highly malignant.
- **2nd and 3rd decade** (children and young adults).
- Unilateral, solid tumor with hemorrhage and necrosis.
- It is **radioresistant** but responds to chemotherapy.
- Similar to its that in testis, usually occurs in combination with other GCTs (mixed GCT).
- **CD 30 positive.**

5- CHORIOCARCINOMA

- Rare aggressive, highly malignant, **metastasizes** widely through the bloodstream to the lungs, liver, bone etc
- **Radioresistant AND chemoresistant.**
- Similar to its that in testis, usually occurs in combination with other GCTs (mixed GCT).
- elevated serum hCG levels.
- unilateral, solid, hemorrhagic tumor, composed of malignant cytotrophoblast and syncytiotrophoblast.

Metastatic Carcinoma In Ovary

- Accounts for approximately 5% of ovarian tumors.
- Older ages, mostly bilateral and sometimes very large.
- Primaries are **Gastro-intestinal tract** (most common), breast and lung.
- One of the most classic forms of metastatic carcinoma involving the ovaries is the **Krukenberg tumor**. This tumor is a metastatic carcinoma composed of signet ring cells in a fibrous background. The most common sites of origin is the GIT (stomach, colon and appendix).

Summary (from Robbin's basic pathology)

SUMMARY

Ovarian Tumors

- Tumors may arise from epithelium, sex cord–stromal cells, or germ cells.
- Epithelial tumors are the most common malignant ovarian tumors and are more common in women older than 40 years of age.
- The major types of epithelial tumors are serous, mucinous, and endometrioid. Each has a benign, malignant, and borderline (low malignant potential) counterpart.
- Sex cord–stromal tumors may display differentiation toward granulosa, Sertoli, Leydig, or ovarian stromal cell type. Depending on differentiation, they may produce estrogens or androgens.
- Germ cell tumors (mostly cystic teratomas) are the most common ovarian tumor in young women; a majority are benign.
- Germ cell tumors may differentiate toward oogonia (dysgerminoma), primitive embryonal tissue (embryonal), yolk sac (endodermal sinus tumor), placental tissue (choriocarcinoma), or multiple fetal tissues (teratoma).

Thank You!

We hope you found this helpful and informative.

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