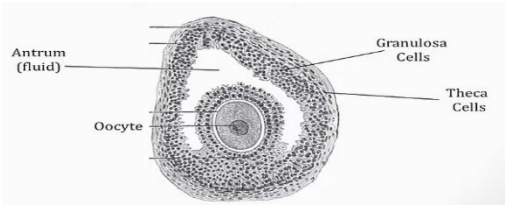
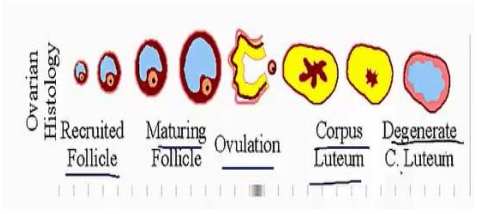
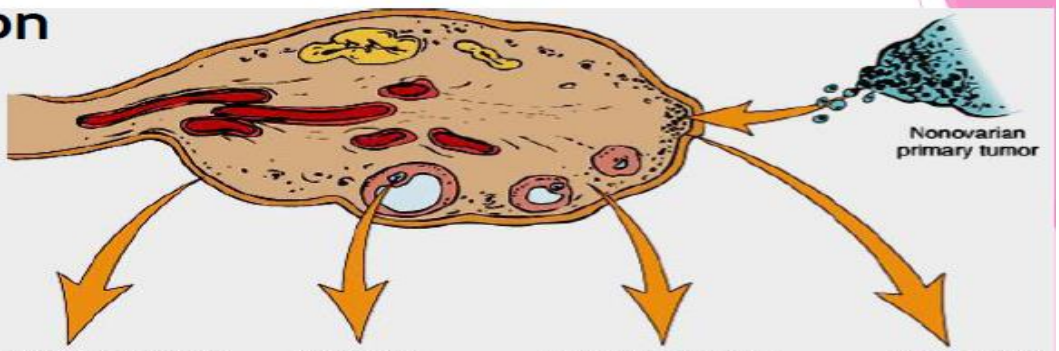
Ovarian Neoplastic Tumor





Derivation of various ovarian tumors & some data on their frequency & age distribution



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	• 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	

**5th most common cancer in women.

**5th leading cause of cancer death in women.

**3 Origins of primary ovarian tumors:

I-The multipotential **surface (coelomic epithelium) =** epi lining of intraembryonic celom *هو عبارة عن simple cuboidal outer layer of وهو يشكل ال F/M gonads *طب شو هو **celom** ؟؟ Space that gives rise to thoracic and abdominal cavities	**II-**The **totipotential germ cells**	**III-**The **multipotential sex cord/stromal** cells**.**
Tumor of which account for the **great majority (75%)** of primary ovarian T, & their malignant forms account for **90% of ovarian cancers.**	Each of these cell types gives rise to a variety of tumors Both II & III T collectively are **less frequent** &, although they constitute 25% of all ovarian T, they account for **10% of ovarian cancers**.	

****pathogenesis :**

Pathogenesis –familial cases	**Pathogenesis-Sporadic cases**
Risk factors: More ovulation >more times the ovarian epi had to repair itself > make ovarian epi susceptible to cancer >more risk (advanced age, early menarche, late menopause , nulliparity) ***nulliparity (have not been pregnant) and **family history**. *use of **OCPs** may **reduce** risk. *Only 5%-10% are familial**(like Breast Ca)** **molecular pathogenesis: *mutations in BRCA1 and **BRCA2 genes.** ***majority** of **hereditary** ovarian & breast cancers seem to be caused by **mutations in the** BRCA1**&** BRCA2 **genes.** ***Indeed**, with mutations in these genes, there is increase **risk for both ovarian & breast cancers.**	**BRCA mutations: 10% of sporadic cases **other important molecular pathways: ***p53** is mutated in **50%** of all ovarian cancers. ***HER2/NEU** over-expression (35%) ***K-RAS** protein over-expression (30%) mostly mucinous cystadenocarcinomas

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

(I) Benign lesions usually cystic (cystadenoma), or with an **accompanying stromal component (cystadenofibroma);**

(II) Malignant tumors may be cystic (cystadenocarcinoma), solid (carcinoma), or combine.

(III) Intermediate =**borderline**= tumors of low malignant potential=low-grade cancers with limited invasive potential, which have a better prognosis than the fully malignant ovarian carcinomas.

Surface epithelial Tumor -Types

		Grossly		Histology	Spread of malignant form
1-Serous **the most frequent ovarian tumors. **Include:	60% benign	**25% of the benign forms are **bilateral .** **The serosal covering of benign is **smooth& glistening**	** most serous T are large (10-40 cm inØ)spherical or ovoid cysts. **O/S, **smaller** cystic T are **unilocular**, **{with single cavity};** but **larger** ones are usually divided by multiple septa into a **multi loculated** cyst. **The cystic spaces are usually filled with a clear serous (watery) fluid, but mucus may also be present.	(a) lined by a **single layer** of tall, **ciliated or dome-shaped** secretory **columnar** epithelium cells. (b) **Psammoma bodies** (concentrically laminated **calcified concretions)** are commonly seen in the tips of papillae.	
	15% borderline	**More complex architecture**		are tumors of low malignant potential ,with **milder cytologic atypia** & typically, **little** or **no stromal invasion** ****Prognosis intermediate** between benign and malignant types (survival with peritoneal metastases 75%)	****might be associated with peritoneal implants**
	25% malignant **the most common malignant ovarian tumors (60%).	****irregularly nodular** from tumor penetration of serosa. ****Papillary projections into the cystic cavities are usually seen, more marked in malignant**		(a) anaplasia of the lining cells appears, as does (b) invasion of the stroma, & capsule. •Papillary formations are complex & multilayered, with invasion of the axial fibrous tissue by nests or totally undifferentiated sheets of malignant cells.	(a) metastatic seeding of the peritoneal cavity, (b) through lymphatics to regional LN, including periaortic LNs, but distant lymphatic & hematogenous metastases are rare

		Grossly	Histology	Spread
2-Mucinous *their mucin-secreting epithelium cell lining, **similar to that of the endocervical mucosa,** (fallopian tube) **•are less likely to be malignant than the serous T** (80% are benign mucinous cystadenomas), **•Much less likely to be bilateral,** •Depending on the architectural complexity:	80% benign	only 5% of benign are bilateral •**Usually large** and **multilocular** (many small cavities and recesses that contain mucous) .	•Psammoma bodies **not** found. **•Stage is major determinant of prognosis** **Mucinous Ovarian Tumor** • mucinous T are similar to serous T, except that filled by mucin.	
	10% borderline			
	10% malignant (cystadeno carcinoma)	**20% of malignant mucinous tumors been **bilateral** with & **bilateral mucinous ca of the **ovary must be differentiated from metastatic** adenocarcinoma in the ovaries (**Krukenbergtumor)**, which may present as ovarian masses.. **The presence of prominent papillation, serosal penetration, & solid areas, point to malignancy.		•Implantation of mucinous T cells in the **peritoneum** with production of **copious amounts of mucin** is called **pseudomyxoma peritonei** (leading to mucinous ascites +bowel obstruction may occur) **;** the **vast majority of these cases <u>are caused</u> by <u>metastasis from the GIT tumors, primarily the appendix</u>**. (leading to mucinous ascites •Metastasis of mucinous ca of the GIT to the ovaries (**Krukenbergtumor**) may also mimic an ovarian primary
3-Endometrioid **15% to 30%of women with these ovarian T have a concomitant endometrial carcinoma of the endometrium.** **Similar to endometrial endometrioid cancer, ovarian endometrioid carcinomas have **mutations in the PTEN suppressor gene**	Are usually malignant, although benign & borderline forms exist	**bilateral in 30%** of cases. **these T may be **solid or cystic**, but some develop as a mass projecting from the wall of an endometriotic ovarian cyst filled with **chocolate-colored fluid**. **they are distinguished by the formation of **tubular glands**, similar to those of the endometrium, within the linings of cystic spaces.		
4-Clear cell				
5-Brenner			Contains bladder epi (transitional)	

Germ cell tumor

Tumors of germ cell (oocyte) derivatives

*germ layers = teratoma *germ cells =dysgerminoma *yolk sac =yolk sac tumor *placental tissue =chriocarcinoma

Teratoma	**testicular epithelial tumors are very rare. **Teratomas constitute 20% of ovarian T. **Majority of teratomas are Benign in ovaries. **benign cystic teratomas are never in the testis while testicular malignant germ-cell tumors are the most common ** All are marked by full **differentiation** from totipotential germ cells into mature tissues, representing all three germ cell layers: **ectoderm, endoderm, & mesoderm.** ****Benign form** =**mature cystic teratoma= dermoid cyst** ****malignant form** = **immature teratoma** **benign form : *Most are discovered in **young women (1-20 years)** as an ovarian **masses** or ***Most** discovered **incidentally found by X-ray** *90% **unilateral.** *Grossly: cyst filled with sebaceous secretion and hair; bone and cartilage; epithelium, or teeth. Dermiod : skin like يعني فيها زي مكونات البشرة *1% malignant transformation. complication بسبب ؟؟ طب بما انه تحولها لسرطان قليل ولا شيء لي بنخاف منها وبنشيلها جراحيا * complication : torsion (10% to 15% of cases). ****Struma ovarii** (specialized cell type of teratoma) composed entirely of **mature thyroid tissue** **(monodermal = one element of single germ cell layer)** appearing as small or large solid, unilateral brown ovarian masses. Interestingly may hyper function & produce thyrotoxicosis**.** Classic presentation : hyperthyroidism + ovarian mass
Dysgerminoma	•Counterpart of testicular seminoma •**2nd to 3rd decades.** •occur with gonadal dysgenesis. •All are malignant, but only one-third aggressive & spread; **All radiosensitive with 80% cure.** •**Mostly unilateral**, solid, small to large potato-like gray masses

Sex Cord Tumors;

From supporting cells : theca / granulosa / fibroblast

	Age	Grossly /benign or not	Histology / functioning (producing hormone or not)	Note
(I)Granulosa-thecal cell: * (5-10% of all ovarian T)	**Mostly postmenopausal**, but may occur at any age.	**Unilateral**, small to large, gray to yellow with cystic spaces Mostly benign, but malignant granulosa cell T are seen in 5% to 25% of cases.	Morphology: composed of mixture of: (1) **cuboidal granulosa** cells (may recapitulate ovarian follicle as **Call-Exner bodies**, arrange in cords, sheets, or strands, (2) **spindled/plump lipid-laden thecal cells** which **elaborate large amounts of estrogen promoting endometrial or breast ca.**	
(II) Thecoma-fibroma:	**Any age**	**Benign**, **unilateral**, Solid, & gray	Morphology: **fibrocytes**, to yellow (lipid-laden) plump **thecal cells.** ***Most are hormonally inactive; few elaborate estrogens**	****For obscure reasons, about 40% produce ascites + hydrothorax = (Meig'ssyndrome).** *CP = ovarian fibroma +ascites +pleural effusion *unclear etiology but may be related to capillary leak from tumor factor
(III) Sertoli-Leydig cell	**All ages**	**Rarely malignant Unilateral** Usually small, gray to yellow-brown, & solid	**Recaps (simulate) testis development, with **tubules or cords & plump pink Sertoli cells** **Tumor produce androgen	Many masculinizing or defeminizing. *Like = breast atrophy +amenorrhea +sterility +hirsutism

Metastases to Ovary = Krukenbergtumors

Older ages, Mostly **bilateral

Solid gray-white masses up to **20 cm in Ø(1 Kg)

**Anaplastic T cells in cords, glands, dispersed through fibrous background.

**Cells may be "signet-ring" mucin-secreting.

****Primaries are GIT, breast, & lung.**

Clinical Correlation of 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 and malignant serous tumors).**

***Functioning ovarian** tumors often come to attention because of hormonal production (**Estrogens or androgens**).

***Most** ovarian T are **asymptomatic** until they are well advanced.

***30%** of all ovarian T are discovered incidentally on routine gynecologic examination!