Malignant ovarian tumours

Basically ovarian neoplasm derived from the three ovarian components (epithelial, germ cell and the sex-cord stromal elements). Most common ovarian malignancy is epithelial type (70-80% of ovarian neoplasm). Most epithelial tumours are not discovered at early stage but only when they have already spread and the results of treatment will be poor.
More women die from ovarian cancer than from carcinoma of the cervix and body of uterus combined in spite that the incidence of ovarian cancer is nearly similar to that of the cervix and of the endometrium.

Etiology:

Age; incidence of epithelial tumours increase with age to a peak of 50-70 years. While those younger than 35 years often they are non-epithelial tumours such as germ cell tumours while sex cord tumours can occur at different age groups.
Parity : epithelial tumours more frequently associated with nulliparity
Menstrual history; epithelial tumours associated with early menarche and late menopause.
Method of contraception: Oral contraceptive pills reduces the risk epithelial tumours
Genetic factors; Familial ovarian cancer was found among those with family history of ovarian, breast, endometrial cancer and colorectal cancer.
Probably this is attributed to defective gene in those families (mutation in BRCA1 and BRCA2 genes make them oncogens and spread in the family as autosomal dominant inheritance).

Pathology of ovarian tumours:

1. Epithelial carcinomas;

They are usually partly cystic and partly solid and they may be bilateral. Well-differentiated tumours have better prognosis than the poorly differentiated ones.
About 10% of epithelial tumours are of borderline malignancy, they show varying degree of nuclear A typia and increased mitotic activity but with no invasion of the stroma and rarely have metastasis. Most borderline tumours remain confined to the varies and for this they carry good prognosis.

Classification of epithelial tumours;

A. Serous tumours
Benign serous cystadenoma
Border line serous cystadenoma
Malignant serous cystadenocarcinoma or adenocarcinoma

B. Mucinous tumours
Benign mucinous cystadenoma
Borderline cystadenoma
Malignant mucinous cystadenocarcinoma or adenocarcinoma

C. Endometroid tumours
Benign endometriod cystadenoma
Border line tumour
Endometriod carcinoma or adenocarcinoma

D. Brenner, often benign

Markers of epithelial tumours:
Serum Ca 125, although it may raise in benign conditions like endometriosis, It is produced from epithelial tumours and can be used as marker to monitor treatment of the disease specially those using chemotherapy. Fall in the level of ca 125 indicate tumour destruction but raised level or persistent after treatment indicate that persistent disease or recurrent tumour.

2. Sex cord stromal tumours

Granulosa cell tumour, it occurs at all ages and produce steroid hormones mainly estrogen, this postmenopausal bleed when occur in the postmenopausal women or precocious puberty when occur in the prepubertal girls. Granulosa cell tumours often of low-grade malignancy most present at stage 1.
Granulosa cell tumours usually solid with cystic spaces, the tumour may attain large size. On cut surface yellow appearance of lipid containing cells that produce steroid hormones. Areas of hemorrhage also present.

Sertoli-leydig cell tumour, rare tumours often produce male hormones that cause virilization, also they have low-grade malignancy.

3.Germ cell tumours

Malignant teratomas, are immature type of teratomas with solid character, they are unilateral. On cut surface appear solid with small cystic spaces. They are very malignant tumours. Blood levels of BhCG and AFP are usually elevated.

Dysgerminomas, solid tumours with smooth or nodular surface they are soft in consistency, they may get large size. The tumour usually occurs before 30 years of age. It may produce BhCG. They have usualy good prognosis, as they are usually stage 1.

Yolk sac (endodermal sinus) tumours, usually encapsulated solid tumours with areas of necrosis and hemorrhage with firm to rubbery consistency. They are highly malignant and they often produce AFP that used as tumour marker to monitor and follow up the patient during and after treatment.

Spread of ovarian tumours;

Direct spread to the pelvic peritoneum and the other pelvic organs. *Transperitoneal* spread with the peritoneal fluid and via the lymphatic channels to the under surface of the diaphragm, to omentum, and to peritoneal surface of the intestine and liver.

Lymphatic spread involves para-aortic lymph nodes and sometimes to nodes of the neck or inguinal region.

Hematological spread usually occurs late in the disease mainly to the liver, lung or even brain.

Staging:

It is often surgical and mainly depends on what can be seen at laparotomy. Exploration of the whole peritoneal cavity should be done, omentum, intestine and peritoneal surface of the liver and the under diaphragm should be checked for any deposits, para-aortic lymph nodes assessed and any peritoneal fluid or ascitic fluid should be send for cytological study.

Features of malignant tumour:
Can be identified during surgery like *bilateral tumour, *solid with cystic spaces with *hemorrhage and areas of necrosis, *irregular surface and dilated superficial vessels, presence of* ascitis, tumour* adherent to the surrounding and presence of visible *extension and deposits on the peritoneal cavity, all these features suggest malignant tumour but final diagnosis will depend on the histopathological study.

FIGO staging for the primary ovarian cancer;
Stage 1; growth limited to the ovaries.

A. Growth limited to one ovary, with no ascitis and no tumour on the external surface (capsule is intact).
B. Growth limited to both ovaries, with no ascitis and no tumour on the external surface (capsule is intact)
C. Tumour with either A or B but with ruptured tumour capsule or with ascitis containing positive malignant cells.

Stage 2; tumour involve one or both ovaries but with pelvic extension i.e involvement of the uterus, pelvic peritoneum pouch of Douglas.

Stage 3 ; involvement of one or both ovaries but with peritoneal implants outside the pelvis or positive retroperitoneal lymph nodes or inguinal lymph nodes.

Stage 4 ; involvement one or both ovaries but with distant metastasis or involvement of liver parenchyma.

Screening for ovarian cancer:
Because ovarian tumours to start with are A symptomatic and when diagnosed they are often advanced with poor prognosis, screening methods was suggested to identify the disease in its early stages where the outcome of the treatment will be successful.
Unfortunately, no single method with high specificity is available for early detection of ovarian tumours. Tumour markers such as Ca 125, Ultrasonography have been used but with low specificity.

Treatment:

Surgery is the mainstay of both diagnosis and treatment of the ovarian cancer after good vertical incision the whole peritoneal cavity should be

explored for any deposit, the ascitic fluid or peritoneal wash taken for cytology.
The definitive surgical treatment will be either

1. Total abdominal hysterectomy and bilateral salpingo-opherectomy with omentectomy. For stage 1 and 2.
2. Debulking (cytoreductive) surgery for more advanced disease to remove as much as possible from the tumour mass and the deposits making it more responsive to the adjuvant therapy i.e chemotherapy.
3. Conservative surgery for young nulliparous women with stage lA disease, it involves unilateral salpingo-opherectomy only and leaving the other normal ovary, final surgery done later.
4. Those with borderline tumour, opherectomy alone will be adequate for young women while in older women total hysterectomy and bilateral salpingo-opherectomy should be done.

Radiotherapy, it rarely used now as adjuvant therapy after surgery

Chemotherapy, it is indicated for stage **2-4,** using them either post-operatively to deal with residual deposits or used as a main treatment. Carboplatin or cisplatin are effective in treatment of ovarian cancer.

5 ***year survival***
90% for those with stage 1A&B with well or moderately differentiated tumour
10% for stage 3 and 23% for all stages.
Those with borderline tumour has good long term prognosis.