



Tumors :

1. Benign .
2. Malignant .
3. Hematoma .
4. Teratoma .

Characteristics of the tumor cell :

Amounts of eosinophilic cytoplasm and large hyperchromatic, polymorphic nuclei with prominent nucleoli.

Difference between Hematoma & Teratoma

❖ **Haematoma :**

- ▲ Is a collection of tissues originally present in the organ but they're disorganized .
E.g. Angiomyolipoma (in the kidney)
The kidney has blood vessels (angio) , smooth muscles (myo) and fat (lipoma) .
- ▲ It can't go into malignant (usually) .

❖ **Teratoma :**

- ▲ Is a collection of tissues which are not usually present .
E.g. Dermoid cyst (in the ovary) →
It contains bone , hair follicles , cartilage ...etc , and of course they aren't present in the normal ovary !! .
- ▲ It goes into malignant (*Totipotential cells*) .

Totipotential cells : Cells which Have a potential to differentiate .

Difference between benign and malignant

Benign tumors :

encapsulated .
Not metastasize
Not invade. (But can compress) .

Malignant tumors :

non- capsulated (some malignant tumors may have *pseudocapsule* which is tissue of the organ) .
Metastasize .
Invade .



Difference between metastasis & invasion

Metastasis :

The tumor is in organ & goes into organ which is **away** from the first one (discontinuity) .

E.g. tumor in the bladder → Liver .

Invasion :

The tumor invades the same or adjacent organ .

E.g. tumor in the bladder → Uterus .

Liver , lung & bone are the most organs may have metastasis

Because of the **high vascularity** (↑ **blood supply**) .

Whereas **brain** is the least because of the BBB (**Blood Brain Barrier**) .

Grading & Staging

Grading :

It's the characteristics of the tumor .

It concerns the microscopic appearance of the cells. I.e Histological features (layers of epithelium) .

Differentiation :

1. Well differentiated
2. moderately **differentiated**
3. **poorly differentiated** ,
4. **Undifferentiated [aplastic] . the most aggressive**

⬆ Some cancers have a slightly different system of grading. For example, breast cancers are graded 1, 2 or 3 which is much the same as low, intermediate and high grade.

The fastest growing tumor → the least differentiation .

Staging :

It's the relation between the primary tumor (the original organ which the tumor came from) , the adjacent organs & the distant organs .

E.g. stage IV bladder cancer → the cancer which's gone outside the bladder & it involved other organs .



How do we stage ?

By staging system:

There're many staging systems, but there're 2 main staging systems :
classical & International .

Classical : I ,II ,III & IV.

Stage I ,II & III → The tumor within the organ & the adjacent organs (NO
lymph nodes involvement) .

Stage IV : distant metastasis .

International : TNM .

More descriptive .

T: Tumor .

N : Nodes (lymph node) .

M : Metastasis .

T : Concerned **ONLY** the primary tumor .

(!)

E.g. T IV bladder tumor : You can't say there's a tumor in the bladder and has gone to the liver .

T IV **IS NOT** stage IV , because we're talking about different staging systems .

Special staging system :

Duke's staging system :

A, B, C, and D .

❖ Why do we stage the tumors?

- ⤴ For planning for the management & treatment .
- ⤴ For the prognosis .

❖ How does the tumor metastasize ?

1. Lymphatic .
2. Direct spread .
3. Transcelomic (through the body cavities [plural & peritoneal]) .
4. Hematogenesis .



❖ Tumor investigation :

- ⤴ It depends on the symptoms and the site
- ♣ Some tumors are found incidentally !!

❖ How do we investigate ?

- ⤴ Tissue diagnosis
 - ♣ Stage the disease In most cases(99.9%) .
 - * Cytology :
 - Exfoliative cytology :sputum , urine, wash the area and take the fluid for investigation.
 - F.N.A .(Fine Needle Aspiration) : cytology for solid tumors .
 - * Biopsy : needle
 - incisional (ulcer on the skin)
 - Excisional : breast lump
- ⤴ Investigate the common organs for tumor metastasis .
E.g. A lady with breast cancer , you can do a chest x-ray , liver scan , bone scan .

(Take parts of the malignant and normal to compare and to see the degree of the cancer).

❖ Tumor markers :

- ⤴ Substances , if they're present in the blood or some body fluid ,they may indicate a presence of a particular tumor .
- ⤴ Unfortunately Most of them are **non- specific** .
- ⤴ The 1st tumor marker discovered is : *carcinoembryonic antigen* .

❖ Hormones & cancer :

- ⤴ There're two main examples :
 - ♣ Cancer of the prostate & androgen
 - ♣ Cancer of the breast & estrogens
- ⤴ Some hormones may be produced by organs which normally don't produce this hormone .
E.g. some lung malignant cells may produce ACTH (which's produced by the kidney) .