

Al-Mustaqbal University College
Department of Nursing



Pathophysiology

Lecture \5

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▶ Malignant Tumors

- ▶ The nomenclature of malignant tumors essentially follows that of benign tumors, with certain additions and exceptions.
- ▶ • Malignant neoplasms arising in “solid” mesenchymal tissues or its derivatives are called sarcomas, whereas those arising from the mesenchymal cells of the blood are called leukemias or lymphomas. Sarcomas are designated by the cell type of which they are composed, which is presumably their cell of origin. Thus, a cancer of fibrous tissue origin is a fibrosarcoma, and a malignant neoplasm composed of chondrocytes is a chondrosarcoma.

- ▶ While the epithelia of the body are derived from all three germ cell layers, malignant neoplasms of epithelial cells are called carcinomas regardless of the tissue of origin. Thus, a malignant neoplasm arising in the renal tubular epithelium (mesoderm) is a carcinoma, as are the cancers arising in the skin (ectoderm) and lining epithelium of the gut (endoderm).

- Carcinomas are subdivided further. Carcinomas that grow in a glandular pattern are called adenocarcinomas, and those that produce squamous cells are called squamous cell carcinomas. Sometimes the tissue or organ of origin can be identified, as in the designation of renal cell adenocarcinoma. Sometimes the tumor shows little or no differentiation and must be called *poorly differentiated or undifferentiated carcinoma*.

- ▶ All of these diverse elements are thought to derive from epithelial cells or myoepithelial cells, or both, and the preferred designation for these neoplasms is **pleomorphic adenoma**.
- ▶ **Fibroadenoma** of the female breast is another common mixed tumor.
- ▶ **Teratoma** is a special type of mixed tumor that contains recognizable mature or immature cells or tissues representative of more than one germ cell layer and sometimes all three. **Teratomas** originate from totipotential germ cells such as those normally present in the ovary and testis.

- ▶ The terms **lymphoma** (is a group of [blood cancers](#) that develop from [lymphocytes](#)),
- ▶ **Mesothelioma**, is a type of [cancer](#) that develops from the thin layer of tissue that covers many of the internal organs (the [mesothelium](#)). The most common area affected is the [lining of the lungs and chest wall](#)
- ▶ **Melanoma**, is a type of [cancer](#) that develops from the pigment-containing cells known as [melanocytes](#).
- ▶ **Seminoma** is a [germ cell tumor](#) of the [testicle](#) or, more rarely, the [mediastinum](#) or other extra-gonadal locations
- ▶ **All above are used for malignant neoplasms.**

▶ CHARACTERISTICS OF BENIGN AND MALIGNANT NEOPLASMS

▶ There are four fundamental features by which benign and malignant tumors can be distinguished:

- ❖ Differentiation and anaplasia,
- ❖ Rate of growth,
- ❖ Local invasion, and
- ❖ Metastasis.

▶ Criteria used for cytopathological diagnosis of cancer:

- ▶ **Laboratory diagnosis:** the pathologist studies the section paying special attention to:
 - ❖ The cytological appearance of the tumor cell
 - ❖ The relation of these cell to the surround tissue especially as regard the invasion of this tissue by the tumor cell.
- ▶ **Biopsy:** the biopsy method of frozen section is invaluable particularly in the case of Brest tumor, it has however limited which should be recognized, particularly by the surgeon. The frozen section are twice the thickness of those of the paraffin method. The examination of several block from different part of the tissue is seldom possible the rushed atmosphere of the operation room.

▶ **In cytology, nuclear criteria** serve as a guide as in order to establish diagnosis of malignant tumor, these criteria include:

1. **Anisokaryosis:** (Nucleo-cytoplasm ratio which is variable or high macrokaryosis), nuclear greater than 10 micron in diameter.
2. **Multi nuclei** in a single a nucleus, especially present variability in size within the same cell.
3. **Elevated mitotic index**, the present of abnormal mitotic figures asymmetric in appropriately aligned.

4. Prominent nucleoli, the present of irregular or angular nucleoli, the present of variable nuclear size with in a nucleus, nuclear molding (deformation of nuclear next to each other with in cell) a coarse or blotchy chromatin pattern, large cell carcinoma of the lung, malignant cell exhibit prominent nucleoli. Sarcoma diffuse proliferation of large round to oval cell with pleomorphic vesicular nuclei prominent nucleoli and abundant eosinophilic cytoplasm.

5. Nuclear fragmentation or budding can also be observe and correspond to an irregular nuclear shape, variability in cell size can also observed in malignant tumor. However they are not exclusive to these general characteristic of neoplastic cell nucleoli.

6. Anisocytosis (variability in cell size), macrocytosis (the present of large cell, hypercellularity , the present of highly cellular sample . and polymorphism , the present of cell of variable shape in sample.

7. Hyperchromasia. refer to the dark staining nuclei which is usually due to increase DNA content , in this example of small cell carcinoma of the lung , all of the tumor cell exhibited darkly stained nuclei and the cell have very little cytoplasm , another feature commonly seen in malignant cells increase mitotic activity is also present .

8. Mitotic are often numerous in malignant process and reflect increase proliferative activity.

▶ Cancer Therapy

Several treatments for cancer are available. All have the highest rate of success with early identification of the cancer.

1. **Surgery** is useful in the diagnosis and treatment of cancer. For diagnostic purposes an incisional biopsy, excisional biopsy, needle biopsy, or endoscopy is performed to remove a tissue sample. Microscopic examination of the sample confirms a definitive diagnosis of cancer and facilitates staging of the tumor. Surgery has a better chance of curing a cancer if used on solid, well-circumscribed tumors. Tumors that have metastasized may be treated with

1. **Radiation therapy** uses ionizing radiation to kill tumor cells and at least 50% of cancer patients are treated with radiation sometime during their illness.
2. **Chemotherapy** uses cytotoxic drugs to treat cancer and has been a standard of treatment since the 1970s. The goal of chemotherapy is a cure; however, it also may be used to interfere with tumor cell multiplication, control disease spread, and for palliative purposes.
3. **Bone marrow transplantation** involves the injection of hematopoietic cells into the bone marrow of the cancer patient.
4. **DNA methyl transferase inhibitors** that reverse epigenetic processes associated with the methylation of tumor suppressor genes are under investigation.

Any Question?