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المرحلة الثالثة

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Neoplasia:

Neoplasia means (new growth) and a new growth is called a neoplasm .A neoplasm can be defined as an abnormal mass of tissue ,

the growth of which exceeds and is uncoordinated with that of normal tissues and persists in the same excessive manner after cessation of the stimuli which evoked the change.

Tumors can be classified into two major groups:

1) Benign tumors 2) malignant tumors.

Benign Tumors:

In general, benign **tumors** are designated by attaching the suffix-oma to the cell of origin.for example

Fibroma is a benign tumor arising in a fibrous tissue.

Chondroma is a benign tumor arising in a cartilage.

A denoma is applied to a benign epithelial neoplasm derived from glands.

Papilloma is a benign epithelial neoplasm producing microscopic or macroscopically finger like projections from epithelial surfaces.

Cystadenoma is a benign tumor that form large cystic mass as in the ovary.

The suffix oma is used to denote benign tumor but this is not always true.There are some exceptions,for example:

Hematoma is a collection of blood inside an organ or tissue outside the blood vessel,so it is not a true tumor.

Granuloma is a focus of granulomatous inflammation ,so it is not a true tumor.

Hamartoma refers to disordered growth of tissues However,these tissues are growing at site of origin (endogenous site),for example,Hamartoma of the lung which contain blood vessel, cartilage and other components which are distributed in haphazard pattern.

Malignant Tumors:

Malignant tumors arising in mesenchymal tissue are usually called *sarcomas*.

Malignant tumors of epithelial cell origin derived from any of the three germ layers ,are called *carcinoma* .

***Squamous cell carcinoma* denote a cancer in which a tumor cells resemble stratified squamous epithelium.**

***Adenocarcinoma* denotes a lesion in which the neoplastic epithelial cell grow in glandular pattern .**

General Pathology

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TABLE 7-1 Nomenclature of Tumors

Tissue of Origin	Benign	Malignant
COMPOSED OF ONE PARENCHYMAL CELL TYPE		
Tumors of Mesenchymal Origin		
Connective tissue and derivatives	Fibroma Lipoma Chondroma Osteoma	Fibrosarcoma Liposarcoma Chondrosarcoma Osteogenic sarcoma
Endothelial and Related Tissues		
Blood vessels	Hemangioma	Angiosarcoma
Lymph vessels	Lymphangioma	Lymphangiosarcoma
Synovium		Synovial sarcoma
Mesothelium		Mesothelioma
Brain coverings	Meningioma	Invasive meningioma
Blood Cells and Related Cells		
Hematopoietic cells Lymphoid tissue		Leukemias Lymphomas
Muscle		
Smooth	Leiomyoma	Leiomyosarcoma
Striated	Rhabdomyoma	Rhabdomyosarcoma
Tumors of Epithelial Origin		
Stratified squamous	Squamous cell papilloma	Squamous cell carcinoma
Basal cells of skin or adnexa		Basal cell carcinoma
Epithelial lining of glands or ducts	Adenoma	Adenocarcinoma
	Papilloma	Papillary carcinomas
	Cystadenoma	Cystadenocarcinoma
Respiratory passages	Bronchial adenoma	Bronchogenic carcinoma
Renal epithelium	Renal tubular adenoma	Renal cell carcinoma
Liver cells	Liver cell adenoma	Hepatocellular carcinoma
Urinary tract epithelium (transitional)	Transitional-cell papilloma	Transitional-cell carcinoma
Placental epithelium	Hydatidiform mole	Choriocarcinoma
Testicular epithelium (germ cells)		Seminoma Embryonal carcinoma
Tumors of Melanocytes	Nevus	Malignant melanoma
MORE THAN ONE NEOPLASTIC CELL TYPE—MIXED TUMORS, USUALLY DERIVED FROM ONE GERM CELL LAYER		
Salivary glands	Pleomorphic adenoma (mixed tumor of salivary origin)	Malignant mixed tumor of salivary gland origin
Renal anlage		Wilms tumor
MORE THAN ONE NEOPLASTIC CELL TYPE DERIVED FROM MORE THAN ONE GERM CELL LAYER—TERATOGENOUS		
Totipotential cells in gonads or in embryonic rests	Mature teratoma, dermoid cyst	Immature teratoma, teratocarcinoma

Characteristics of benign and malignant tumors

1)Macroscopically:

a)Rate of growth

Benign tumors are slowly growing tumors.

Malignant tumors are rapidly growing tumors.

b)Mode of growth

Benign tumors grow as cohesive expansile masses that remain localized to their site of origin and do not have the capacity to infiltrate, invade or metastasize to distant sites.

Malignant tumors grow as an invasive masses that can be expected to penetrate the wall of the uterus or the colon for example.

C) Regarding the capsule

Benign tumors ,because benign tumors grow and expand slowly,they usually develop a rim of compressed connective tissue,sometimes called a fibrous capsule,which separate

them from the host tissue. This capsule keeps the benign neoplasm as a discete,rapidly palpapible,and easily movable mass that can be surgically removed.
Malignant tumors,malignant tumors don't have a capsule . Because they grow as an invasive masses, such invasiveness makes their surgical resection difficult or impossible.
Exception to all of the above ,leiomyoma of the breast is a benign tumor that do not have a capsule. Renal cell carcinoma is a malignant tumor that have a capsule.

d)Metastasis

Metastasis marks a tumor as benign or malignant because benign neoplasm do not metastasize.

2)Microscopically :hemorrhage and necrosis are absent in benign neoplasm,but present in malignant tumors.

3) Differentiation and anaplasia

Differentiation refers to the extent to which neoplastic parencymal cells resemble the corresponding normal parenchymal cells,both morphologically and functionally, lack of differentiation is called anaplasia.

In general benign tumors are well differentiated, malignant tumors are characterized by a wide range of parenchymal differentiation.,from

Surprisingly well differentiated to completely undifferentiated.

Malignant neoplasms that are composed of poorly differentiated cells are said to be anaplastic.Lack of differentiation or anaplasia, is considered a hallmark of malignancy.

Pathway of spread :

Dissemination of cancers may occur though one of three pathways:

1)Direct seeding of the body cavities or surfaces,

The peritoneal cavity is most often involved,but it can also affect the pleural ,pericardial and joint spaces.

2)Lymphatic spread . Transport through lymphatics is the most common pathway for initial dissemination of carcinomas and sarcomas.most common example is carcinoma of the breast

Which usually arises in the upper outer quadrants and then disseminate to the axillary lymph nodes.

3) Hematogenous spread .Certain cancers have a propensity for invation of veins.,like renal cell carcinoma.

Carcinogenic Agents and Their Cellular Interaction

1)Radiation Carcinogenesis .Radial energy,whether in the form of the UV rays of sunlight or as ionizing electromagnetic radiation is a well

Established carcinogen.Ultra violet radiation can be divided into three wave lengthsUVA(320-400nm),UVB(280-320nm),UVC(200-280).UVB is believed to be responsible for the induction of cutaneous cancer.

2)Microbial Carcinogensis.

Oncogenic RNA cancers in humens. Human T-cell leukemia virus type 1

(HTLV-1) . causes a form of T-cell leukemia/lymphoma.

In addition there is onchogenic DNA virus.,helicobacter pylori.

3)Age Age has an important influence on the likehood of being affected with cancer.Most of the cases occur after the age of 55years.

But there is an exception as caner can also occurs in children as in the united states acute leukemia and primitive neoplasm of the central nervous system are responsible for more than60% of childhood cancer.

4) Genetic predisposition to cancer

Autosomal Dominant inherted cancer syndroms

It means the inheritance of a single autosomal dominant mutant gene

(which means a mutation in the tumor suppressor gene) greatly increases the risk of developing a tumor.The most common example is familial adenomatous polyp which is caused by mutation of adenomatous polyposis coli (APC) tumor suppressor gene.

Autosomal recessive paterrn.

A group of cancer predisposing conditions characterized by,defects in DNA repair and resultant DNA instability.like cancer of colon.

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