

تفريغ علم وظائف الأعضاء المرضي



اسم الموضوع:

CANCER

السرطان

إعداد الصيدلاني/ة:

آمنة بعبارة

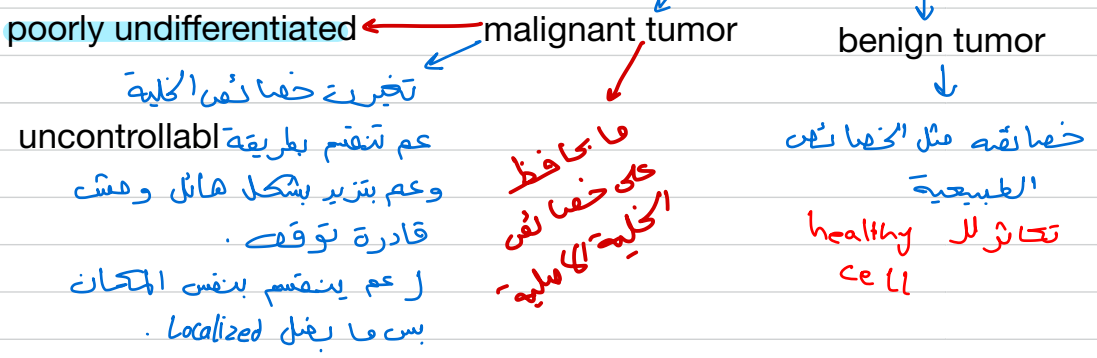


انقسام لار mitosis بعد معين

المخلية يقرطين والثانية لتنضم كرمعين
بعدين بوقف

- شو هو ال Cancer بشكل عام ؟ معروف بالدرابة انه Normal Cell ينقسم ويتكاثر طالوالد
يكبر بالحجم (ينقسم لعدد معين) .

- عنا ورم حمير وورم خبيث (ورم يعني ← tumor)



ما يحافظ على خفايف الخلية الاصلية

↓
تتجمع على بعضها
clumps ويتحل

invasion → انه يطلع من مكان مكان
Metastasize → عم ينتشر

* (سؤال) *

هل الحمير بطيء والخبيث سريع ؟

الجواب بشكل عام نعم ، بس يوجد استثناءات .

عبارة عن سرطان



Neoplasia

Introduction



Introduction to neoplasia

السرطان هو المرض الثاني للوفاة بال USA وبلادنا ثانية.

➤ CANCER is the 2nd leading cause of death in the USA & in many other countries.

الشخص يمكن يتعالج منها

➤ Some cancers, e.g., Hodgkin lymphomas & acute lymphocytic leukemia are curable, whereas others such as cancer of the lung & pancreas have high mortality.

معدلات وفيات عالية لا Lung pancreas (ما بينشفي منها)

➤ The only hope for controlling cancer lies in learning more about its cause and pathogenesis.

➤ Cover: basic biology of neoplasia; the nature of benign & malignant tumors, the molecular basis of neoplastic transformation, & their clinical features.

عقوبة من اليج صنفو

هلون
بجكركلنا
عشاك نتصم
السرطان لا
ندرس ونظم
عنه

Cancer a genetic disorder

- Cancer is a **genetic disorder** caused by **DNA mutations** that are acquired spontaneously or induced by environmental insults.

environment

Risk factors

هناك الطفرة يمكن أن تنتج من عدة عوامل :
البيئة
عوامل الخطر

- These **genetic changes** alter the expression or function of key genes that **regulate fundamental cellular processes**, such as **growth, survival, and senescence**.

النمو

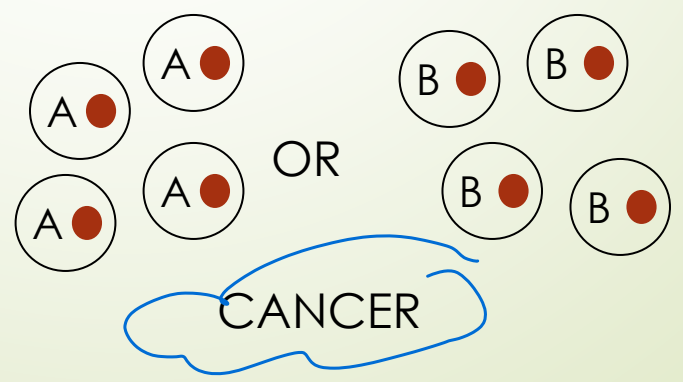
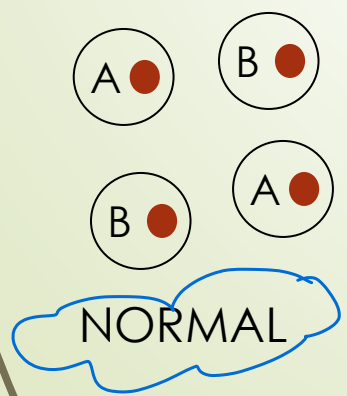
البقاء
على قيد
الحياة

الشيخوخة

الاستنساخ

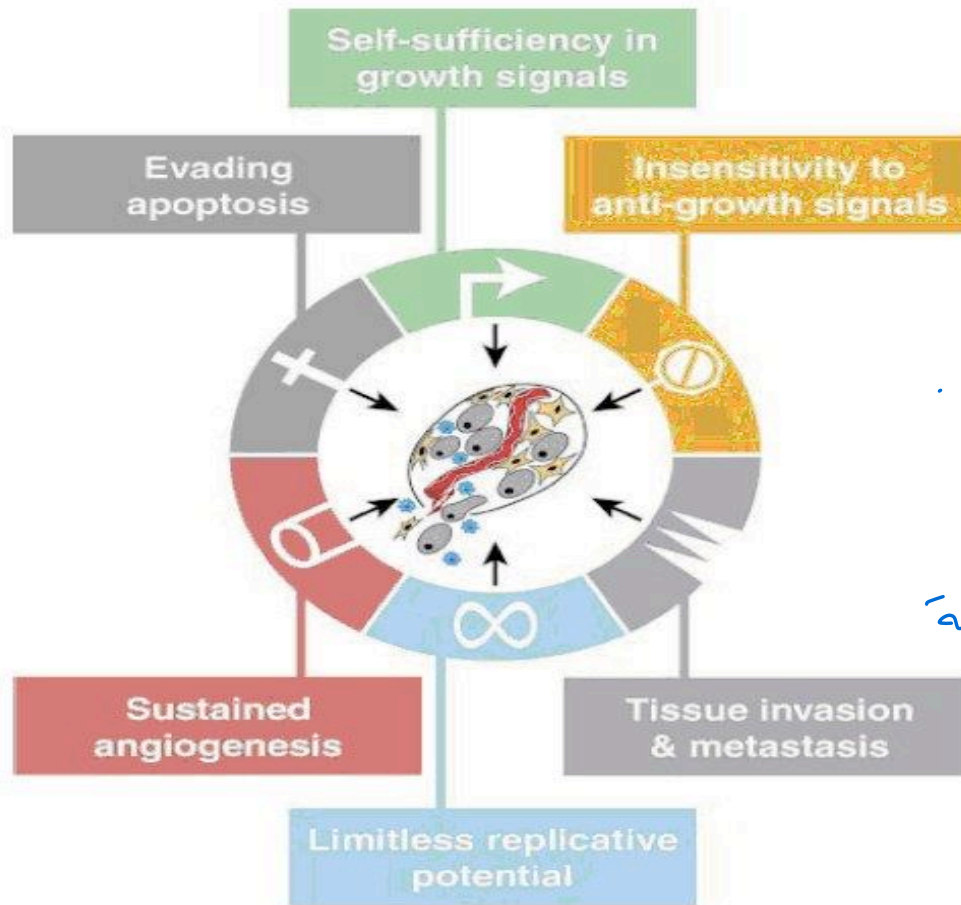
Tumor Clonality

- These genetic alterations are heritable, being passed to daughter cells upon cell division. As a result, cells harboring these alterations are subject to Darwinian selection (survival of the fittest).
- Because the selective advantages are conferred on a single cell that ultimately gives rise to the tumor, all tumors are clonal (i.e. the progeny of 1 cell, clonality).



شو فوا
كبه
بيضاغف

Hallmarks of Cancer



تجمع / تكريس (أفوق بعينه) Accumulation of mutations gives rise to a set of properties that have been called hallmarks of cancer.

طفرات
مهارت
بالجينات
المسؤولة
عن تكاثر
دفعو الخلايا

فقدان الاستجابة للتحكم الطبيعي Loss of responsiveness to normal growth controls is fundamental to the origin of all tumors.

الطبيعي

عصر

← لازم نتحكم بعصر الورم.

Definitions

- **Neoplasia** means "new growth"; referred to as a **tumor**.
- **Oncology** (**oncos**= tumor, & **logos**=study of).
- **Definition:** Neoplasm is an **abnormal mass of tissue**, the **growth of which exceeds & is uncoordinated** with that of the normal tissues & persists in the same excessive manner after the cessation of the stimuli which evoked the change.
- **Tumors behave as parasites & compete with normal tissues & cells** for their metabolic needs, have a certain degree of autonomy (self-control) & steadily **increase in size regardless of their environment & nutritional status of the host**. Tumors depend on the host for their nutrition & blood supply.
- **There are two types of tumors: *benign & malignant***, based on a neoplasm's potential clinical behavior.

Benign tumors

الكورام
الحميدة

Benign tumors produce a localized mass:

1. Innocent. حميدة (بريئة)
2. Localized: do not spread to other sites, → بمنطقة معينة، ما ينتشر
3. Can be surgically removed completely, → عملية جراحية بشكل كامل
4. Patients generally survives.

* تأثيرات tumors *

- These tumors may produce serious effects in certain sites (pressure effect e.g. within the brain) or produce hormones, e.g. pheochromocytoma of the adrenal gland.

Malignant tumors

الورم
الخبث

السرطان
البحر

Collectively referred to as cancers, derived from the Latin word for crab, they adhere to any part that they can seize on, it is (difficult to treat).

Malignant Tumors can:

لعبة العاج

تلتصق
بأي جزء يتوقع فيه

1. Inyade (infiltrate) & destroy adjacent structures,
2. Metastasize i.e spread to distant sites to cause death.

يعتز / يحتاج

يُدس

الانتشار

ينتشر للأماكن البعيدة وبسبب الوفاة .

*Not all cancers follow such a deadly course.

مسار صعبة

مكونات الاساسية للاورام

Basic Components of Tumors

➤ All tumors, benign & malignant, have 2 basic components:

(1) the neoplastic cells or the parenchymal cells, which determine their biological behavior.

(2) The supporting, host-derived, non-neoplastic stroma, made up of connective tissue & BV, carries the blood supply & provides support for the growth of parenchymal cells & which is crucial to the growth of the neoplasm.

تصل امدادات الدم

دعم عشان ينمو
Neoplasm

Nomenclature of benign Tumors

In general, BT are designated by attaching the suffix -oma to the cell type from which the tumor arises.

A BT arising in

- * fibrous tissue → fibroma;
- * cartilage → chondroma, etc.

افزہ
1
oma
benign
کینو انہ حمید

The nomenclature of benign epithelial T can be more complex:

Papillomas are BT of epithelium, growing on any surface, (e.g. squamous cell papilloma of skin=wart).

Adenomas are benign epithelial neoplasms (1) producing gland patterns and neoplasms (2) derived from glands

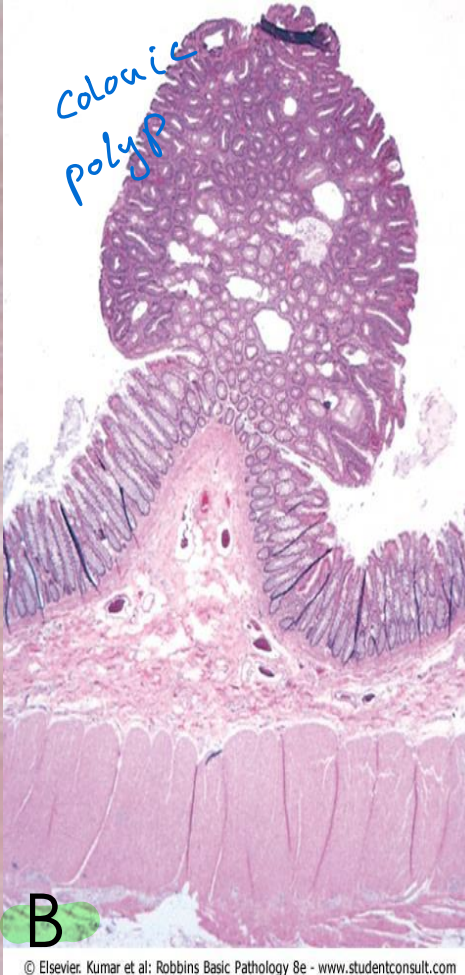
Cystadenomas are hollow cystic adenomas, that typically arise in the ovary.

Polyps are grossly projecting masses above mucosal surfaces, forming a grossly visible structure. Polyps can be Benign or Malignant.

epithelium
glands
ovary
انتفاخات
مألفة من سطح الـ mucosa

کتل بارزہ شکل کینو

کے شکل تگون
حمیدہ ارضیہ



A. Papilloma

B. Colonic polyp: glandular tumor (adenoma) is projecting into the colonic lumen

C. Cystadenomas of the ovary.

Nomenclature of Malignant Tumors

Essentially follows that of benign tumors, with the addition of the suffix:

تنتهي بـ ساركوما
suffix

– Sarcoma, to mesenchymal cells, or

– Carcinoma to epithelial cells, with exceptions

سرطان
ورام

عبارة عن سرطانات

– Sarcomas are cancers arising in mesenchymal tissue or its derivatives & are designated by their histogenesis (i.e. the cell type of which they are composed).

تَشَاء

بتخصص حسب نوع الخلية.

– Eg: cancer of fibrous tissue origin is a fibrosarcoma & of chondrocytes is a chondrosarcoma, etc.

Carcinomas

عند
epithelial
cell

- Carcinomas are metastatic tumors of epithelial cell origin.
- Carcinomas may be classified further into:
- * **Squamous cell carcinomas (SCC)**: cancer in which the tumor cells resemble stratified squamous epithelium.
- * **Adenocarcinoma**: cancer in which the epithelial cells form or grow in glandular patterns.
- Sometimes, the tissue or organ of origin can be identified, as in the designation of cholangiocarcinoma, which means an origin from bile ducts; or renal cell carcinoma;
- Sometimes the T grows in an undifferentiated pattern & must be called poorly differentiated carcinoma.

حسب نوع
epithelial
cell

epithelial cells
التي تنمو بطريقة غدية

Mixed tumors

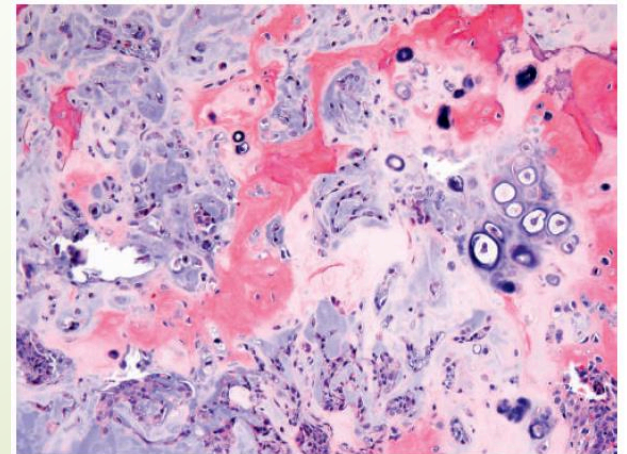
- All tumors are monoclonal in origin.
- In some instances, however, the stem cell may undergo divergent differentiation, creating *mixed tumors*.

- The best two examples are:

✳ Mixed tumor of the salivary gland (a better name is **Pleomorphic adenoma** of the salivary gland). These T have obvious epithelial components, with islands of cartilage or bone.

✳ Fibroadenoma of the female breast is another common mixed T, containing proliferated ductal elements (adenoma) stroma (fibroma).

فيها
Two types
of cells



Special nomenclature

اورام كماله من انسجه
Blastoma
غير نافذ او من nervous tissues
و اغلبهم ضيحه

- ➔ Blastoma: tumors arising in immature tissue or nervous tissue, most of them are malignant

e.g. retinoblastoma ريتو بلاستوما

- * هون يقلق في اورام بستقي ب oma و بتكون ضيحه (اشعيه) (اهي استثناء اي طبيعا)
- ➔ Some tumors attaching the suffix-oma. But malignant

i.e. seminoma, lymphoma, melanoma, mesothelioma

1

2

3

4

هيرو د هيلانو ليفنو ويسمانو

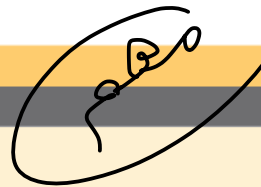


Table 6.1 Nomenclature of Tumors

Tissue of Origin	Benign	Malignant
One Parenchymal Cell Type		
Connective tissue and derivatives	Fibroma Lipoma Chondroma Osteoma	Fibrosarcoma Liposarcoma Chondrosarcoma Osteogenic sarcoma
Endothelium and related cell types		
Blood vessels	Hemangioma	Angiosarcoma
Lymph vessels	Lymphangioma	Lymphangiosarcoma
Mesothelium		Mesothelioma
Brain coverings	Meningioma	Invasive meningioma
Blood cells and related cell types		
Hematopoietic cells		Leukemias
Lymphoid tissue		Lymphomas
Muscle		
Smooth	Leiomyoma	Leiomyosarcoma
Striated	Rhabdomyoma	Rhabdomyosarcoma
Skin		
Stratified squamous	Squamous cell papilloma	Squamous cell or epidermoid carcinoma
Basal cells of skin or adnexa		Basal cell carcinoma
Tumors of melanocytes	Nevus	Malignant melanoma
Epithelial lining of glands or ducts	Adenoma Papilloma Cystadenoma	Adenocarcinoma Papillary carcinomas Cystadenocarcinoma
Lung	Bronchial adenoma	Bronchogenic carcinoma
Kidney	Renal tubular adenoma	Renal cell carcinoma
Liver	Liver cell adenoma	Hepatocellular carcinoma
Bladder	Urothelial papilloma	Urothelial carcinoma
Placenta	Hydatidiform mole	Choriocarcinoma
Testicle		Seminoma Embryonal carcinoma
More Than One Neoplastic Cell Type—Mixed Tumors, Usually Derived From One Germ Cell Layer		
Salivary glands	Pleomorphic adenoma (mixed tumor of salivary gland)	Malignant mixed tumor of salivary gland
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- Epidemiology of Cancer



CHARACTERISTICS OF BENIGN AND MALIGNANT NEOPLASMS

بفرق الحميد عن الخبيث من حيث ٥

- 1- Differentiation and Anaplasia,
- 2- Local invasion, → مكان اجتياح الأورام
- 3- Metastasis → انه از ابيستقل الأورام ولا ٥

(1) Differentiation & Anaplasia

normal cell بالبنية لا tumor parenchymal درجة التشابه لا

- Differentiation means the degree of SIMILARITY of tumor parenchymal (neoplastic) cells, to their normal cells of origin, morphologically & functionally. (**Tumor grade**)

→ (بإضافة خصائص الخلية لخصائصها)

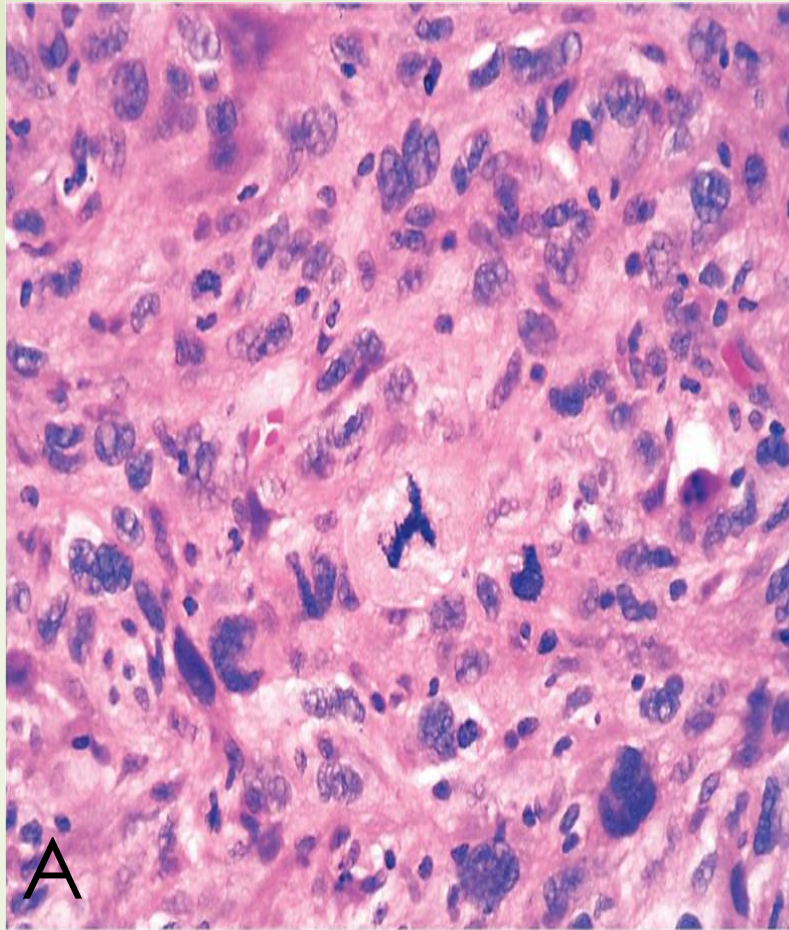
- **Benign T:** composed of well-differentiated cells that closely resemble their normal counterparts. مستشابهة لـ normal

- In BT, mitoses are extremely low in number & are of normal shape.

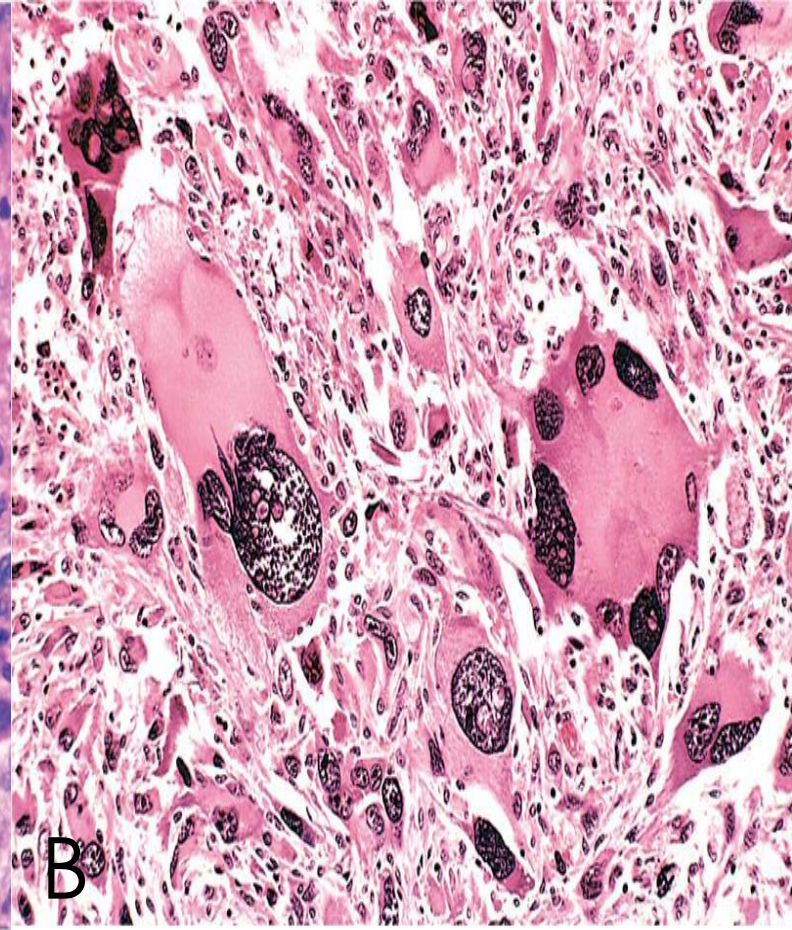
- **Malignant T:** characterized by a wide range of parenchymal cell differentiation from, surprisingly well differentiated through an intermediate (moderately), to poorly or completely undifferentiated T.

- The undifferentiated cells of MT are called **anaplastic**.

بإضافة خصائص الخلية - (undifferentiated) " poorly " (أو)



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Anaplastic tumor cells

A. Cells show pleomorphism, i.e., variations in cellular & nuclear size & shape. The prominent cell in the centerfield has an abnormal tripolar spindle.

B. Anaplastic T of skeletal muscle (rhabdomyosarcoma). Note the marked cellular & nuclear pleomorphism, bizarre & hyperchromatic nuclei, & tumor giant cells.

Differentiation and cell function

- The better the differentiation of the cell, the more completely it retains the functional capabilities found in its normal counterparts.
- كل ما كان اسرع بالنمو
The more rapidly growing & the more anaplastic a tumor is, the less likely it is to have specialized functional activity.
- BT &, even well-differentiated carcinoma of the endocrine glands frequently produce the hormones characteristic of their origin, well-differentiated squamous cell carcinoma produces keratin & well-differentiated hepatocellular carcinoma produces bile.

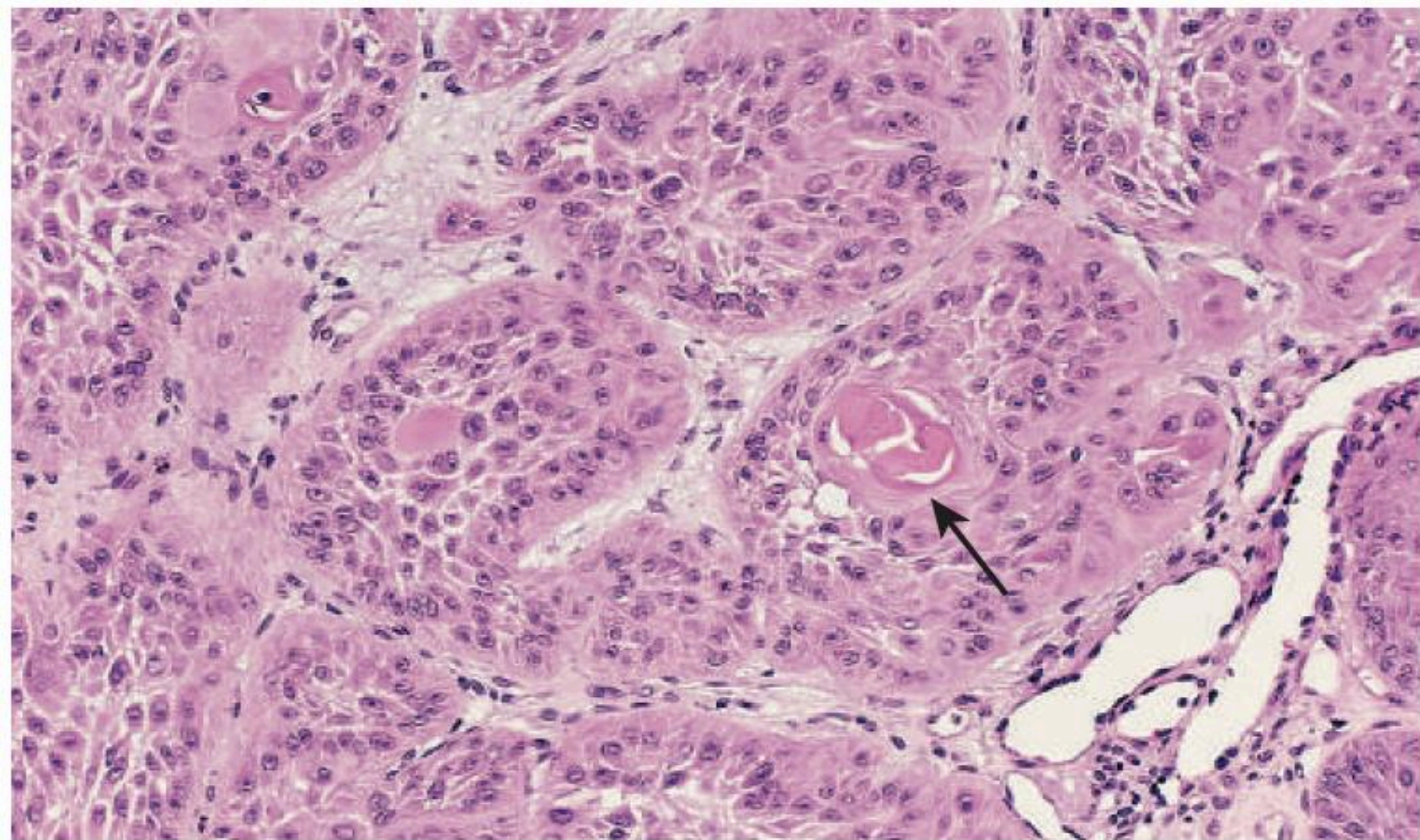


Fig. 6.3 Well-differentiated squamous cell carcinoma of the skin. The tumor cells are strikingly similar to normal squamous epithelial cells, with intercellular bridges and nests of keratin (arrow). (Courtesy of Dr. Trace Worrell, Department of Pathology, University of Texas Southwestern Medical School, Dallas, Texas.)

BT → بنسر / بنسر الجدي

MT → " سريع

بعض استثناءات

Rate of Growth

Most **BT** grow **slowly**, & most **MT** grow **much faster**, eventually spreading locally & to distant sites, causing death, however, there are **exceptions**, & some BT grow more rapidly than some MT.

Rule, most **BT** increase in size slowly over the period of months to years, but there is variation in the rate of growth from one BT to another.

اختلاف في سرعة نمو
من وحدة للتانية

MT → سرعة النمو *
level of differentiation بـ
مربوطة

MT growth rate correlates with their level of differentiation, a rapidly growing T tend to be poorly differentiated, with some exceptions.

Most cancers progressively enlarge over time, some slowly, others rapidly, but the idea that they occur suddenly is not true.

لينتشر او مع الوقت

كسر وقت
cancer
صا بعير فجأة / لينتشر

ال

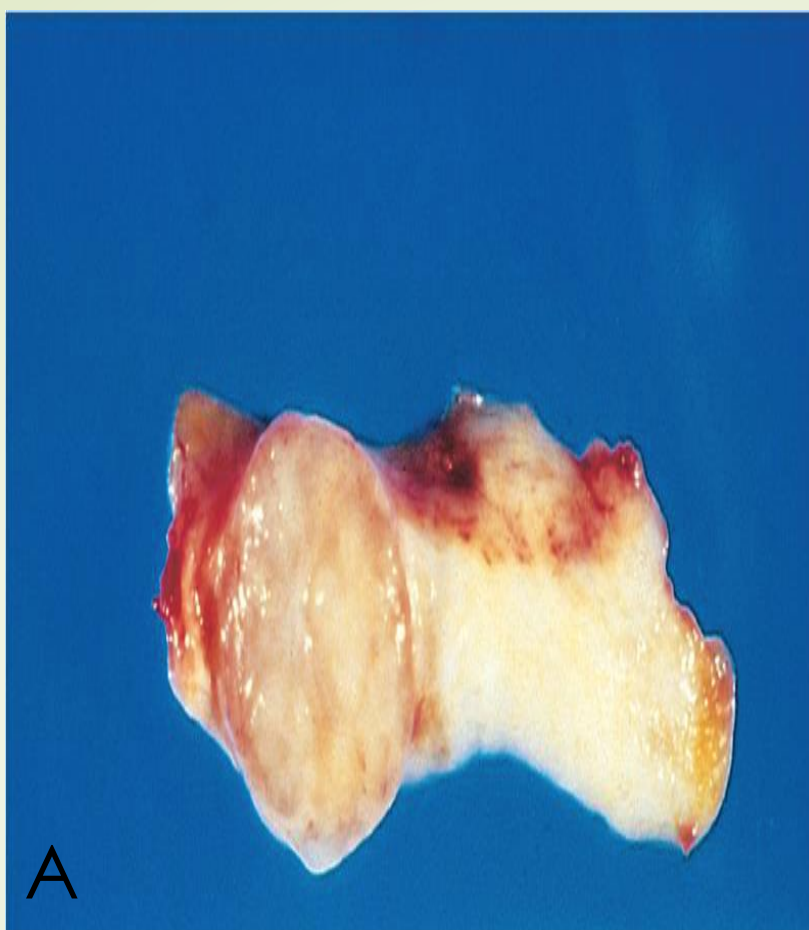
(3) Local Invasion

- Benign tumor: remains **localized** at its origin.
- It **does not** have the capacity to **infiltrate**, **invade**, or **metastasize** to distant sites.
- **Encapsulation** is the formation of an enclosing fibrous **capsule** that separates most BT from the surrounding host tissue.
- Malignant tumors: grow by **progressive infiltration**, **invasion** **destruction**, and **penetration** of the **surrounding tissue**.
- Surgical pathologists carefully examine the margins of resected tumors to ensure that they are devoid of cancer cells (**clear margins**).

علیہ
کسو لہ

ما علیہ
کسو لہ

لے الجراحیست المختصین بعضی ہوا فی الاورام عشان بتا کروا انہا قابلہ کن
سرطان



- A. Breast Fibroadenoma: Encapsulated, tan-colored small tumor on the left is sharply demarcated from the whiter, normal breast tissue on the right.
- B. The tumor is nonencapsulated, infiltrating the surrounding breast substance,

Tumors of The Myometrium

