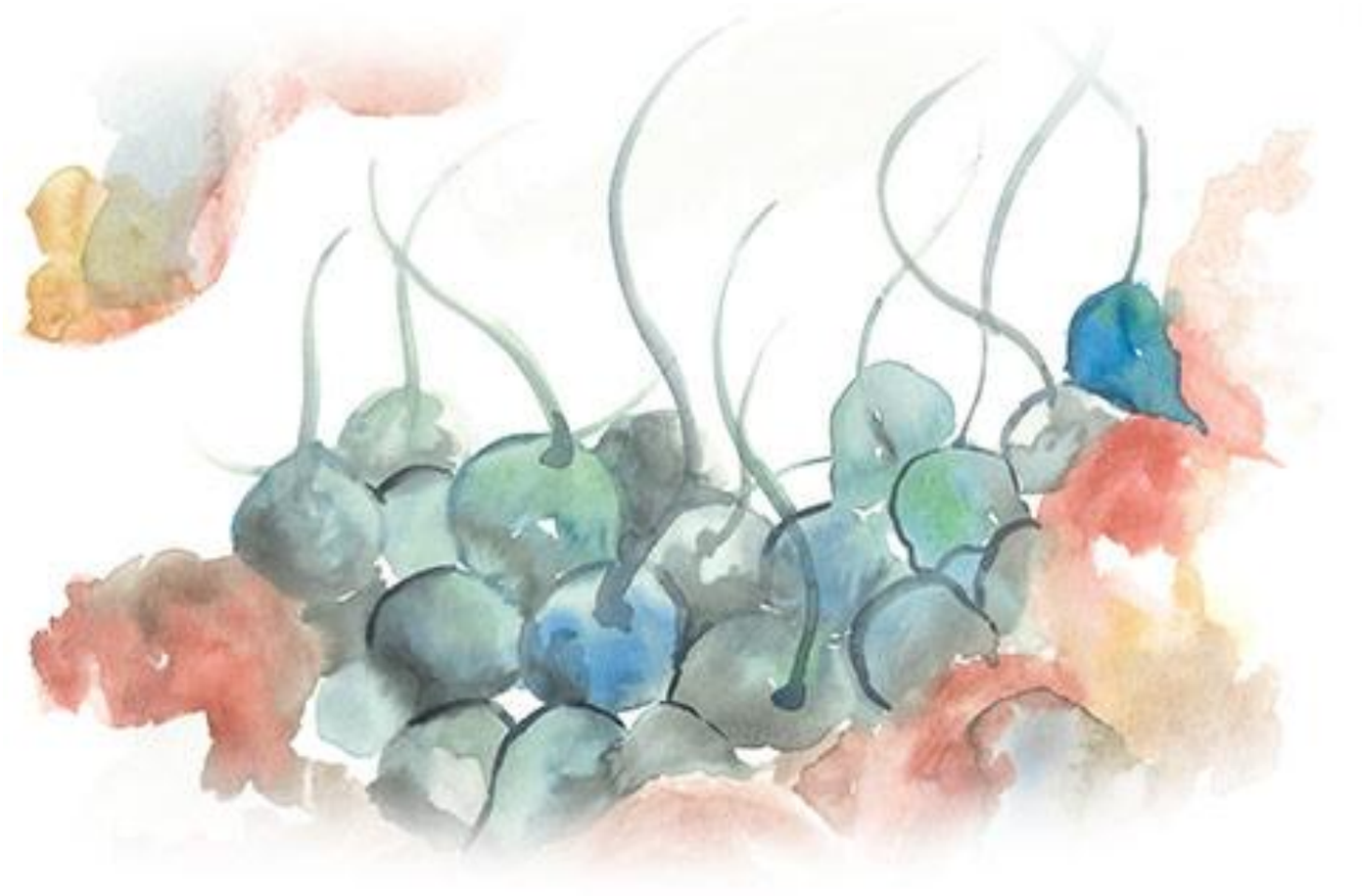
MED437
KING SAUD UNIVERSITY

Team 437 Pathology Practical



Pathology Practical

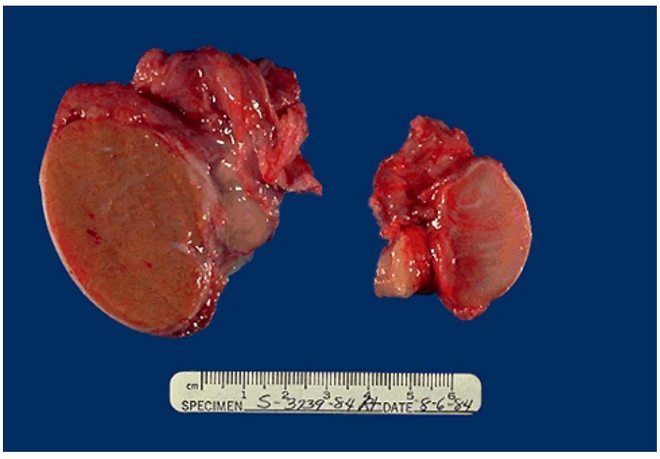
Reproductive Block

Grey: Notes
Pink: Female slides
Blue: Male slides

5 Stations

Case 1: Testicular Atrophy

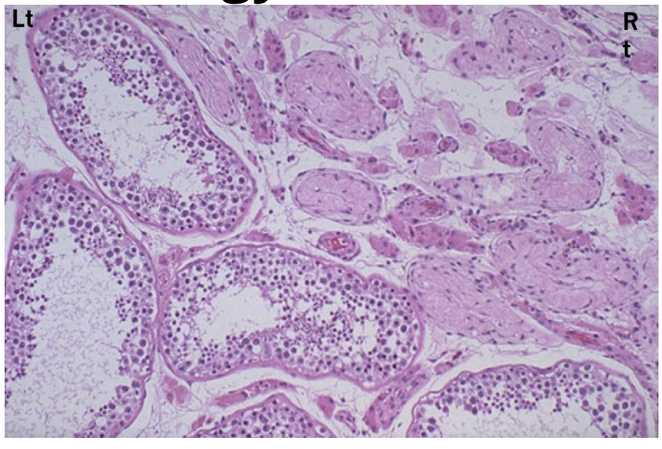
Gross:



Left: Normal testis.
Right: Testis that has undergone atrophy.

Bilateral atrophy may occur with a variety of conditions including:
- Chronic alcoholism
- Hypopituitarism
- Atherosclerosis
- Chemotherapy or radiation
- Severe prolonged illness.

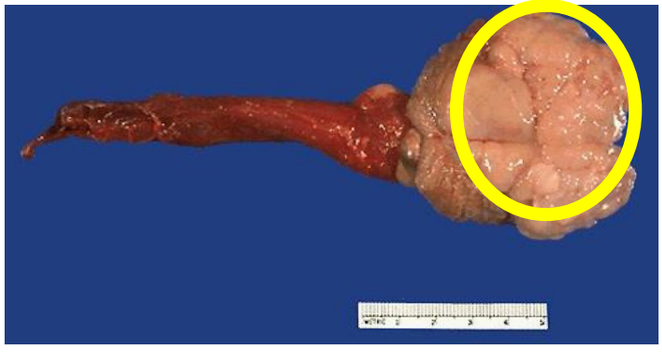
Histology:



- There is **focal atrophy** of tubules seen here to the upper right.
- The most common reason for this is probably childhood infection with the **mumps virus**, which produces a **patchy orchitis**.

Case 2: Seminoma of the Testis

Gross:



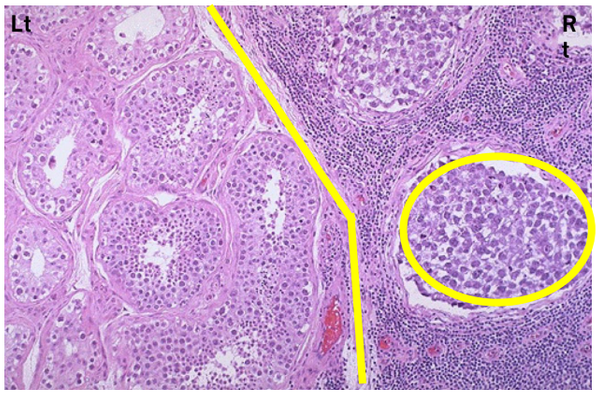
Left: Normal testis.
On the right there is:
- Pale and lobulated testicular mass with bulging and potato like cut surface.
- Attached and congested spermatic cord.

Most important risk factor is **cryptorchidism** (undescended testicle) .

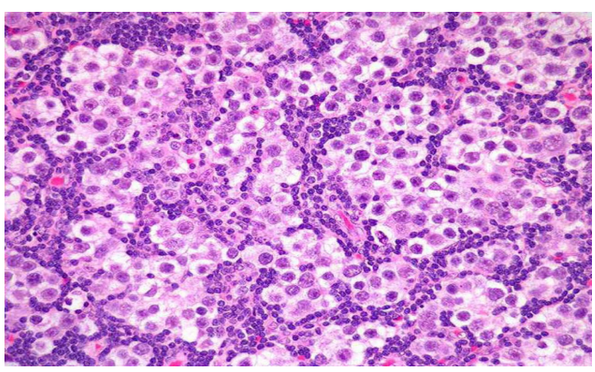
The section shows:
- Pale and nodular tumor.
- Surrounding normal yellowish testicular cut surface.

Germ cell neoplasms are the most common types of testicular neoplasm. They are most common in the 15 to 34 age group. They often have several histologic components: Seminoma, embryonal carcinoma, teratoma & choriocarcinoma.

Histology:



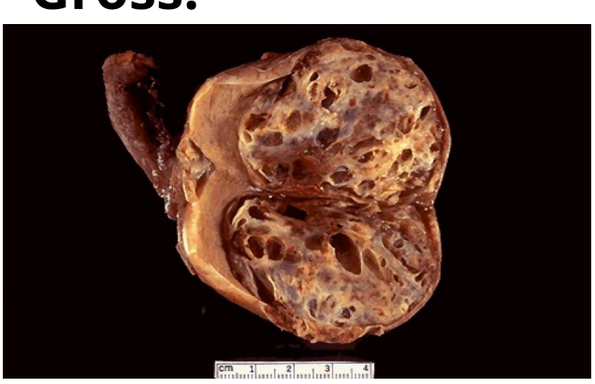
Left: Normal testis.
Right: Seminoma.
Note the:
- Difference in size and staining quality of the neoplastic nests of cells compared to normal germ cells.
- Lymphoid stroma between the nests of seminoma.



This histological section shows:
- Malignant germ cells.
- Large vesicular nuclei.
- Prominent nucleoli.
- Lymphocytes.

Case 3: Embryonal Carcinoma & Teratoma of the Testis

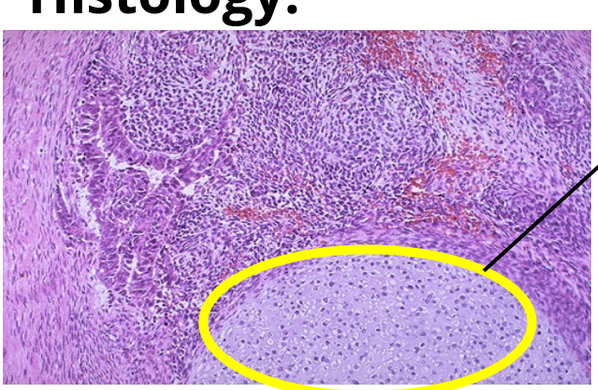
Gross:



- Here is an embryonal carcinoma mixed with teratoma in which islands of bluish white cartilage from the teratoma component are more prominent.
- A rim of normal brown testis appears at the **left**.

The tumor is:
- Partly solid
- Partly cystic
- Hemorrhagic

Histology:



This slide shows:
- Cartilage (at the bottom)
- Malignant glandular tissue consistent with embryonal carcinoma.

Above the cartilage is a primitive mesenchymal stroma and to the left a focus of primitive cells most characteristic for embryonal carcinoma.

Tumor	Peak Patient Age (yr)	Morphology	Tumor Marker(s)
Seminoma	40–50	Sheets of uniform polygonal cells with cleared cytoplasm; lymphocytes in the stroma	10% of patients have elevated hCG
Embryonal carcinoma	20–30	Poorly differentiated, pleomorphic cells in cords, sheets, or papillary formation; most contain some yolk sac and choriocarcinoma cells	Negative (pure embryonal carcinoma)
Yolk sac tumor	3	Poorly differentiated endothelium-like, cuboidal, or columnar cells	90% of patients have elevated AFP
Choriocarcinoma	20–30	Cytotrophoblast and syncytiotrophoblast without villus formation	100% of patients have elevated hCG
Teratoma	All ages	Tissues from all three germ cell layers with varying degrees of differentiation	Negative (pure teratoma)
Mixed tumor	15–30	Variable, depending on mixture; commonly teratoma and embryonal carcinoma	90% of patients have elevated hCG and AFP

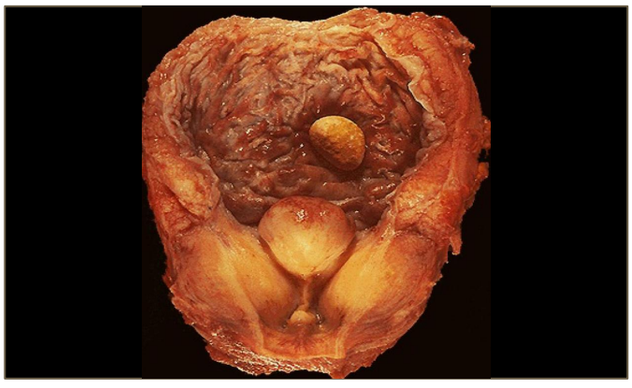
AFP, alpha fetoprotein; hCG, human chorionic gonadotropin.

Know the other types of germ cell tumors that can be in mixed tumors

Male Slides Only

Case 4: Prostatic Hyperplasia

Gross:

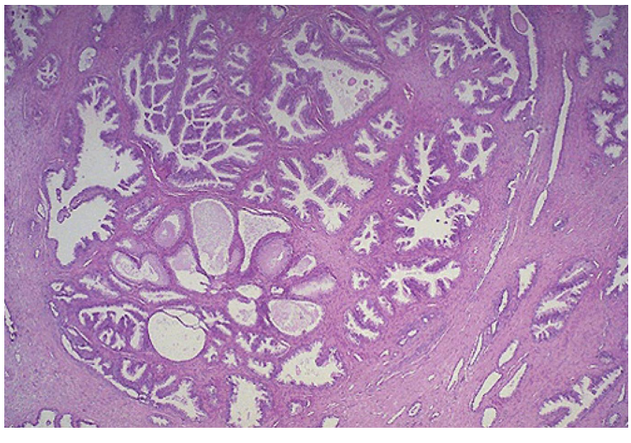


The picture shows:
- Enlarged lateral lobes
- The median lobe has obstructs the prostatic urethra that led to obstruction with bladder hypertrophy
- Prominent trabeculation of the bladder mucosa.
- Obstruction with stasis also led to the formation of the yellow-brown calculus (stone).

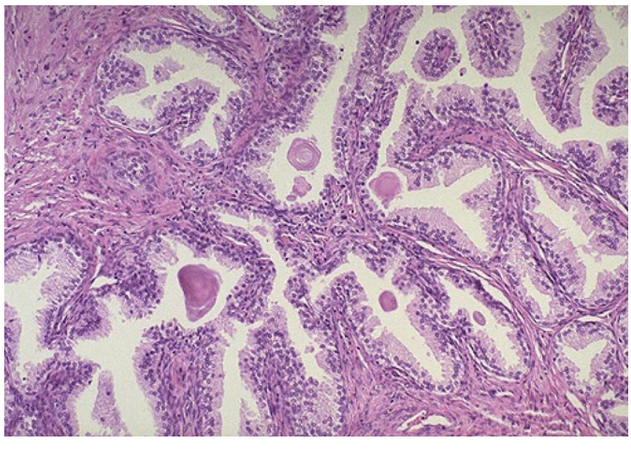
(Central and periurethral parts)
The picture shows:
- Nodular cut surface or nodules (Mainly in the lateral lobes).
- Narrow “slit like” urethra.

Such an enlarged prostate can obstruct urinary outflow and lead to an obstructive uropathy.

Histology:



- Benign prostatic hyperplasia can involve both **glands** and **stroma**, though the former is usually more prominent.
- A large hyperplastic nodule of glands is seen



- The enlarged prostate has **glandular hyperplasia.**
- The glands are well- differentiated and still have some intervening stroma.
- The small laminated pink concretions within the glandular lumens are known as **corpora amylacea**

Symptoms? Urine retention, Difficulties of micturition and dysuria
Site? Central and periurethral
Carcinoma usual site? Peripheral
How to differentiate this lesion from adenocarcinoma? presence of glands as well as sroma.

Case 5: Adenocarcinoma of Prostate

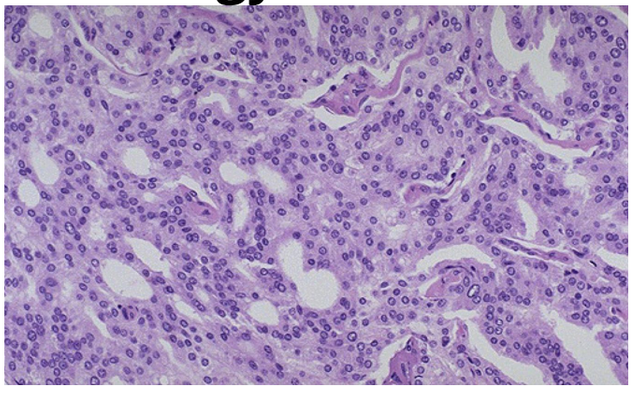
Gross:

Usually affect Peripheral parts

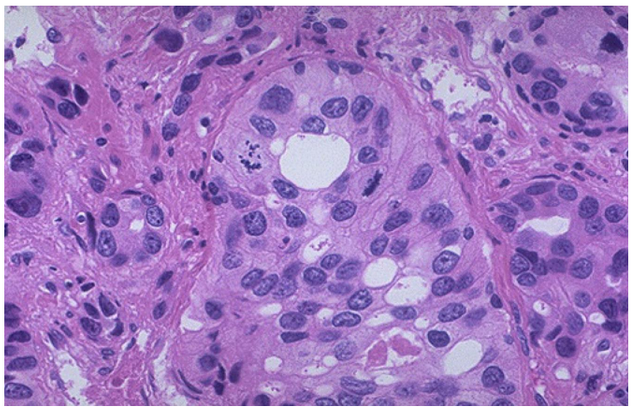
Several pale and (irregular) yellowish nodules are seen in the posterior and periurethral parts of the prostatic gland.

This proved to be Prostatic adenocarcinoma

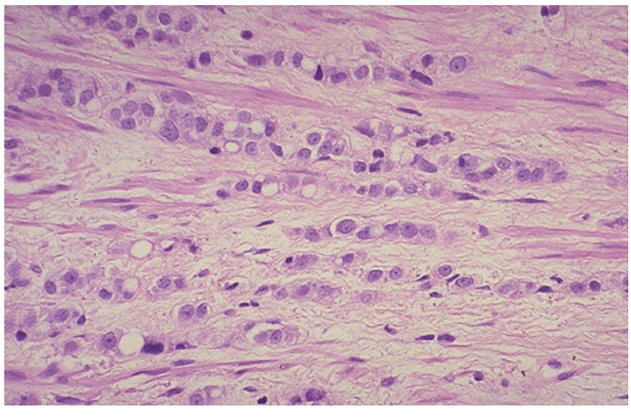
Histology:



The neoplastic glands of prostatic adenocarcinoma are:
- Still recognizable as gland
- There is no intervening stroma
- The nuclei are hyperchromatic.



Poorly differentiated prostatic adenocarcinoma demonstrates:
- Cells with nucleoli
- Mitotic figures.



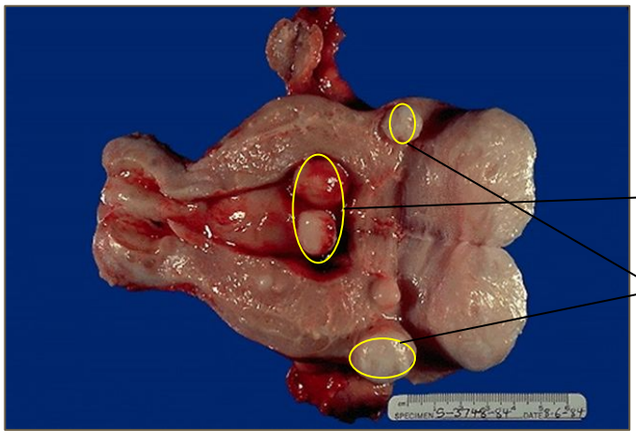
- Poorly differentiated malignant cells.
- No glandular structure is recognizable, only cells infiltrating in rows.

Diagnosis: Prostatic adenocarcinoma.
Grade: High grade, poorly differentiated.

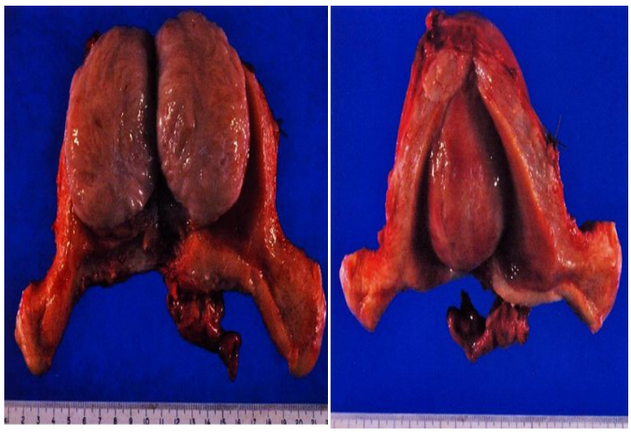
Prostate cancer is graded by the **Gleason system**. According to this system, prostate cancers are stratified into five grades on the basis of glandular patterns of differentiation. Grade 1 represents the most well- differentiated tumors and grade 5 tumors show no glandular differentiation. Since most tumors contain more than one pattern, a primary grade is assigned to the dominant pattern and a secondary grade to the next most frequent pattern. The two numerical grades are then added to obtain a combined **Gleason score**. Tumors with only one pattern are treated as if their primary and secondary grades are the same, and, hence, the number is doubled. Thus the most differentiated tumors have a Gleason score of 2 (1 + 1) and the least differentiated tumors merit a score of 10 (5 + 5).

Case 6: Uterine Leiomyomata

Gross : Multiple Uterine Leiomyomata



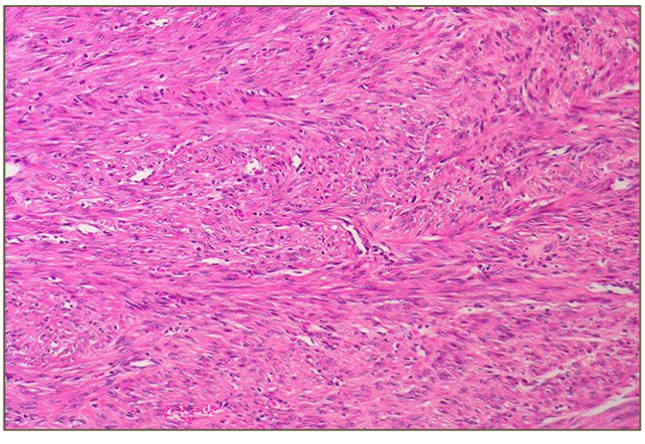
Smooth muscle tumors of the uterus are often multiple.
This gross picture shows:
1- Submucosal leiomyomata of the uterus.
2- Intramural leiomyomata of the uterus.
3- Subserosal leiomyomata of the uterus.
(No capsule)



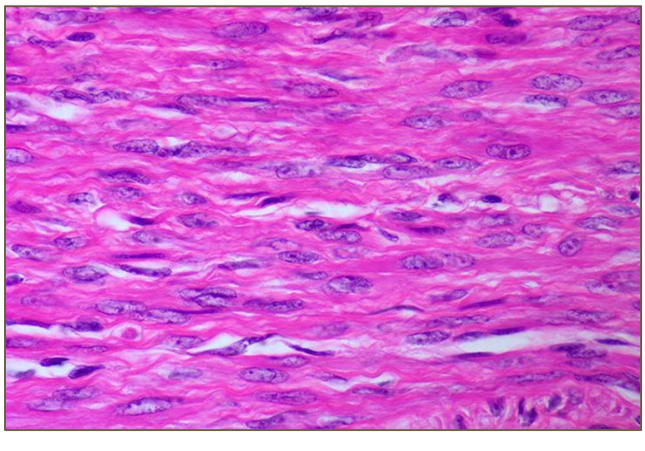
This shows:
A well demarcated tumour mass in the muscle coat of uterus without a definite capsule.

Cell of origin? Smooth muscle cell

Histology :



Tumour consists of :
- Interlacing bundles of **smooth muscle**
- Fibrous tissue.
- Spindle shaped muscle cells with elongated nuclei and eosinophilic cytoplasm.



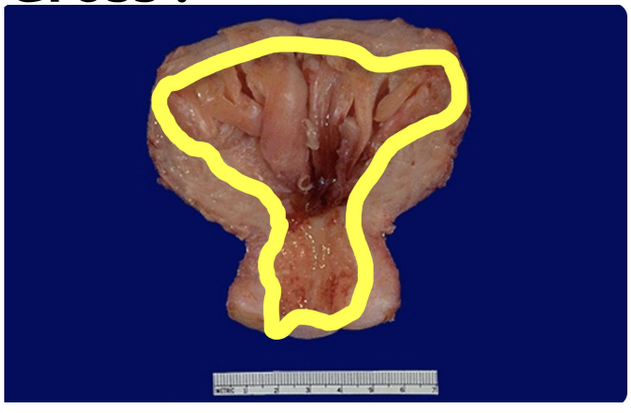
The muscle cells are:
- Spindle shaped
- With elongated nuclei
- Eosinophilic cytoplasm

Case 7: Endometrial Hyperplasia

Endometrial hyperplasia and carcinoma usually results with conditions of prolonged estrogen excess and can lead to:
- Metrorrhagia (uterine bleeding at irregular intervals).
- Menorrhagia (excessive bleeding with menstrual periods).
- Menometrorrhagia.

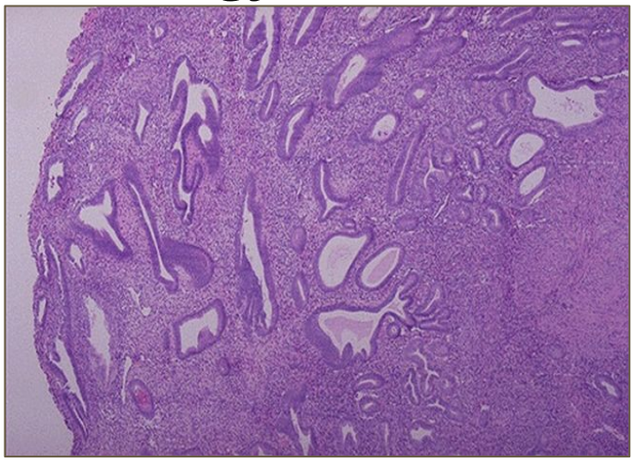
Endometrial hyperplasia is placed in two categories based on the presence of cytologic atypia: *hyperplasia without atypia and hyperplasia with atypia.*
Hyperplasia without cellular atypia carries a low risk (between 1% and 3%) for progression to endometrial carcinoma, whereas hyperplasia with atypia, also called endometrial intraepithelial neoplasia (EIN), is associated with a much higher risk (20%50%).

Gross :



This shows :
- Thick and hyperplastic endometrium.
- Areas of hemorrhage.
- The endometrial cavity is opened to reveal lush fronds of hyperplastic endometrium.

Histology :



Endometrial Hyperplasia without atypia (Simple and cystic endometrial hyperplasia), shows:
- The amount of endometrium is abnormally increased and not cycling as it should.
- The glands are enlarged (cystic and elongated) and irregular with columnar cells (Irregular glands lined by columnar cells) that have some atypia.
- Simple endometrial hyperplasias can cause bleeding.
- Increased glands to stromal ratio. (Most important)

Causes? Excessive estrogen exposure
Ovarian Tumors could lead to this lesion?
1- Theca-fibroma, 2- Granulosa

Case 8: Endometrial Adenocarcinoma

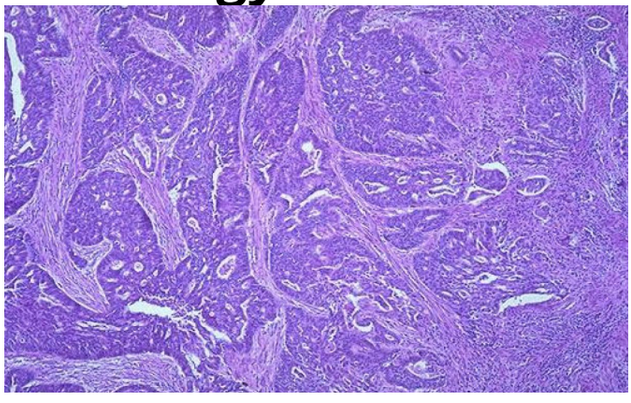
Gross:

This shows:

- Non enlarged uterus
- An irregular mass in the upper fundus that proved to be endometrial adenocarcinoma on biopsy.

Such carcinomas are more likely to occur in postmenopausal women.
postmenopausal bleeding should be suspicious.

Histology:



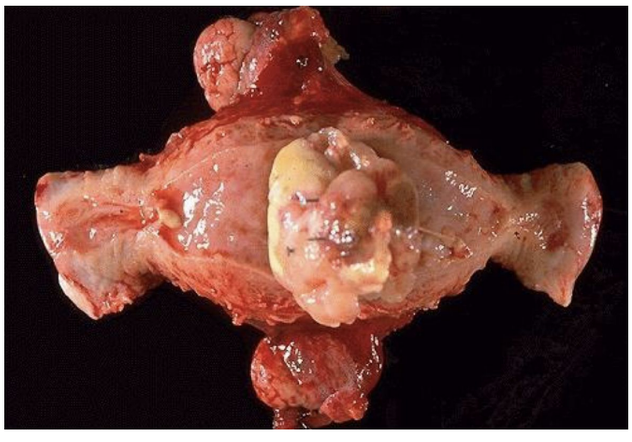
This shows:

- An endometrial adenocarcinoma
- Which is invading into the myometrial smooth muscle bundles of the wall of the uterus.

This neoplasm has a higher stage than a neoplasm that is just confined to the endometrium.

Case 9: Endometrial Leiomyosarcoma

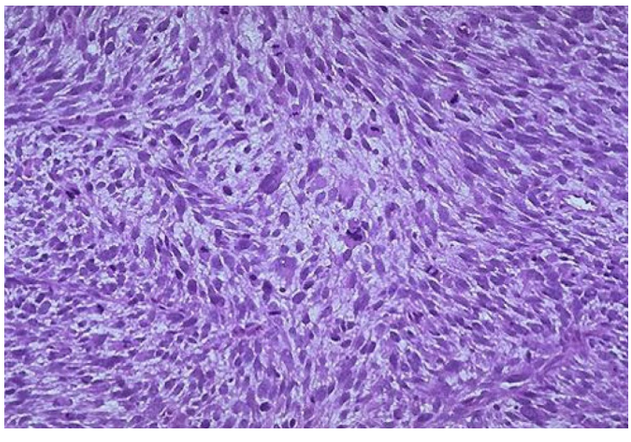
Gross:



This uterus shows:

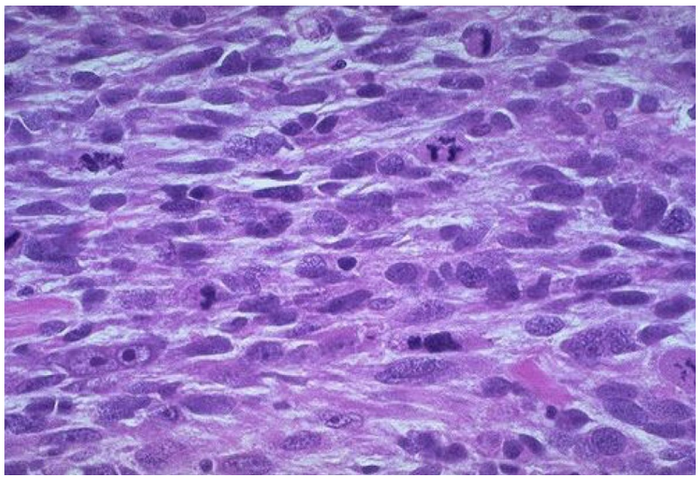
- Large pale irregular mass.
- Protruding from myometrium.

Histology:



This microscopic LPF shows:

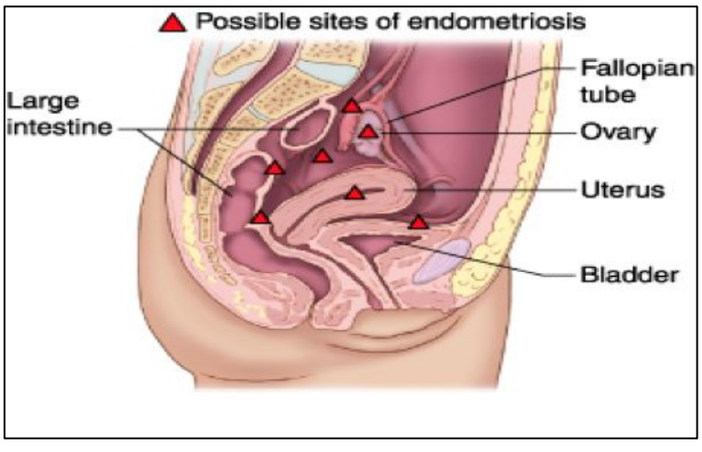
- Much more cellular.
- The cells have much more pleomorphism and hyperchromatism than the benign leiomyoma.
- An irregular mitosis is seen in the center



This HPF shows:

- Nuclear and cellular pleomorphism.
- Mitoses.
- Spindle cells

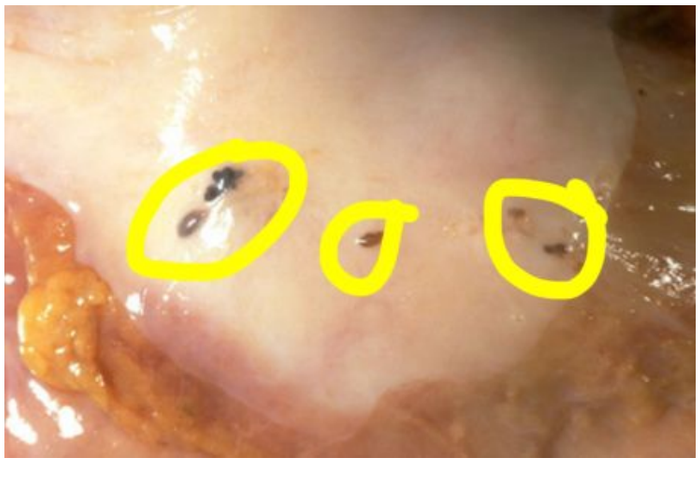
Case 10: Endometriosis



- Endometriosis is a chronic non cancerous disorder of the female reproductive system, develops when the endometrium grows outside the uterus.
- Common sites for endometriosis (ovaries, fallopian tubes, external genitalia (vulva), ligaments supporting the uterus, intestine, bladder, cervix, and vagina).

Gross:

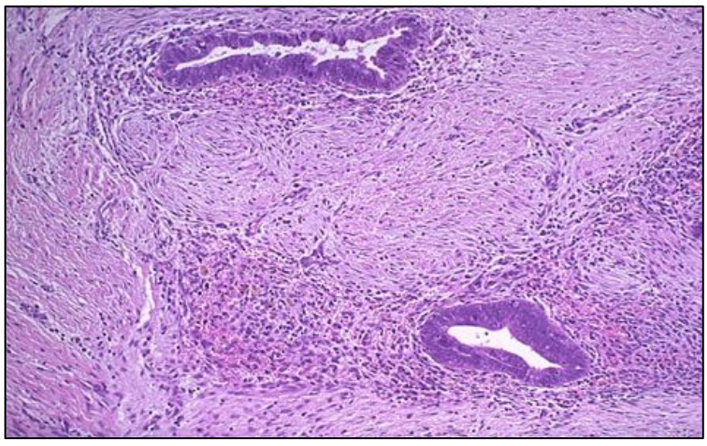
- In areas of endometriosis the blood is darker and gives the small foci of endometriosis the gross appearance of "powder burns".
- Small foci are seen under the serosa of the posterior uterus in the pouch of Douglas.
- **Hemorrhagic spots in peritoneal surface of pouch of douglas** (best description)



It shows:
- Five small areas of endometriosis have a reddish-brown to bluish appearance

locations for endometriosis may include: ovaries, uterine ligaments, rectovaginal septum, pelvic peritoneum, and laparotomy scars

Histology:

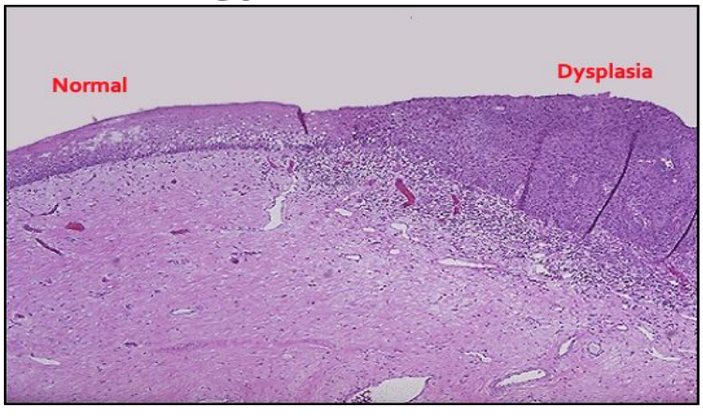


This picture shows:
- Endometrial glands along with stroma are seen in the smooth muscle wall of the colon.
- Fibrosis (lead to infertility)

Endometriosis is symptomatic during reproductive years when patients may present with (dysmenorrhea, pelvic pain, and infertility)

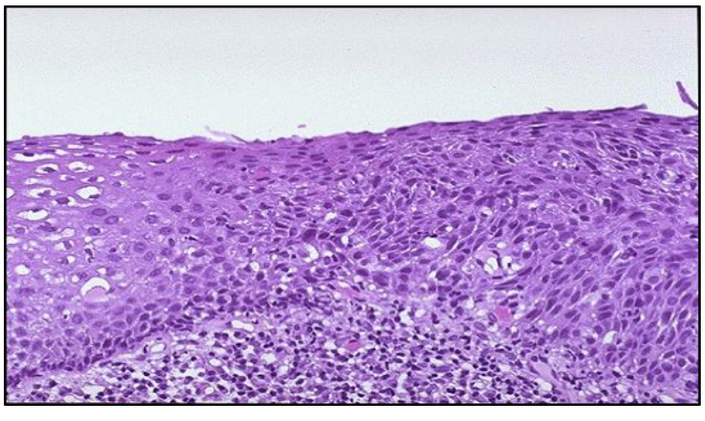
Case 11: Cervical Dysplasia

Histology:



Left: Normal cervical squamous epithelium.
Right: Dysplastic changes with chronic inflammation

Diagnosis:
- Uterine cervical squamous dysplasia.
- CIN (cervical intraepithelial neoplasia).



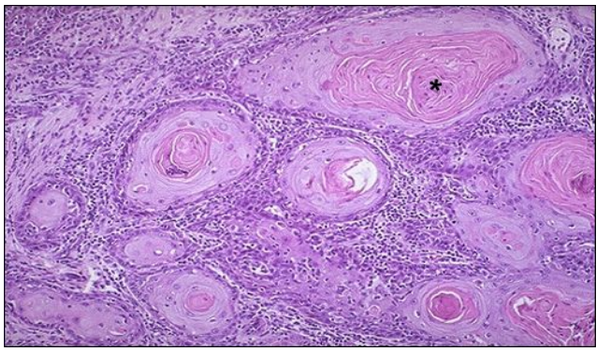
There is:
- Dysplastic cells/nuclei.
- Large and dark nuclei.
- Disordered cells, loss of polarity.
- Chronic inflammatory cells.

Case 12: Cervical Carcinoma

Gross:

This is the gross appearance of a cervical squamous cell carcinoma that is still limited to the cervix (stage I), The tumour is:
- Fungating red to tan to yellow mass

Histology:



- Nests of neoplastic squamous cells are invaded through a chronically inflamed stroma
-This cancer is well- differentiated, as evidenced by keratin pearls **(*)** within nests of tumor cells. However, most cervical squamous carcinomas are non-keratinizing

Important risk factors for the development of CIN and invasive carcinoma thus are directly related to Human Papilloma Virus (HPV) exposure and include:

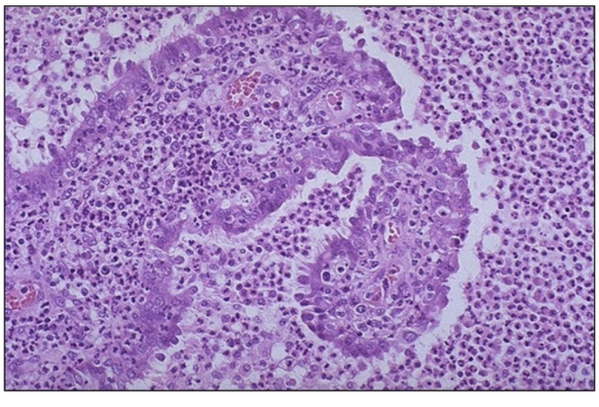
- Early age at first intercourse.
- Multiple sexual partners.
- Male partner with multiple previous sexual partners.
- Persistent infection by high-risk strains of papillomavirus.

Case 13: Acute Salpingitis

Gross:

Excised congested swollen fallopian tube with hemorrhagic patches

Microscopic:



- Remnant of tubal epithelium is seen here surrounded and infiltrated by numerous neutrophils.

- This is acute salpingitis. **Neisseria gonorrhoeae** was cultured.

Case 14: Ovarian Cyst

Gross:

Benign Ovarian Cyst:
- This is probably a follicular cyst.

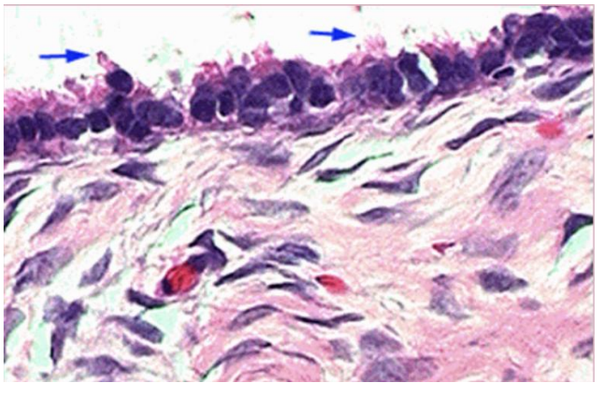
Occasionally such cysts may reach several centimeters in size and, if they rupture, can cause abdominal pain.

<u>Serous Cystadenoma</u> of the Ovary:

- Benign epithelial tumors of the ovary can reach massive proportions.
- The serous cystadenoma seen here fills a surgical pan and dwarfs the 4 cm ruler.

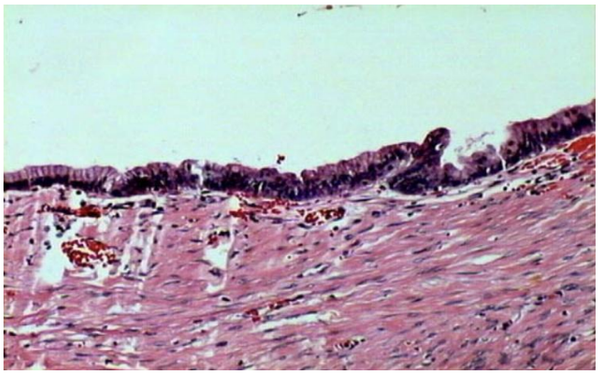
Microscopic:

Serous? Cilia
Mucinous? Mucin-secreting columnar cells



<u>Serous Cystadenoma</u> of the Ovary, shows:
- The blue arrows point to cilia.
- The cells have dark nuclei without nucleoli or mitoses.
- The cytoplasm is eosinophlic and ciliated like tubal epithelium.
- The stroma contains spindly fibroblasts

<u>Mucinous Cystadenoma</u> of the Ovary (LPF), shows:
- Thin wall lined by a single layer of mucin-secreting columnar cells with a basally-placed spherical small nucleus.

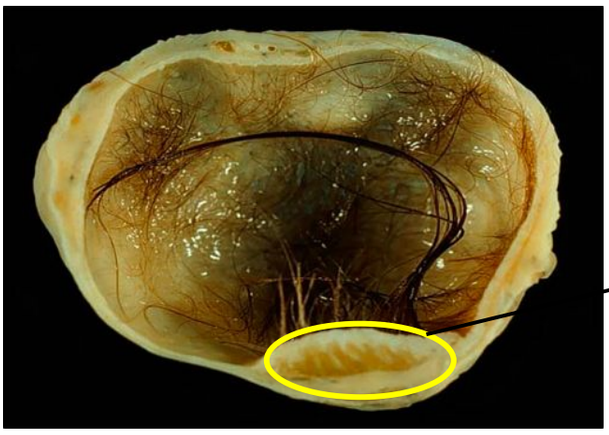


<u>Mucinous cystadenoma</u> of the Ovary (HPF), shows:
- Thin wall lined by a single layer of mucin-secreting columnar cells with a basally-placed spherical small nucleus.

Case 15: Dermoid Cyst (Teratoma) of the Ovary

The presence of **neuroepithelial cells** indicates that the teratoma is immature.

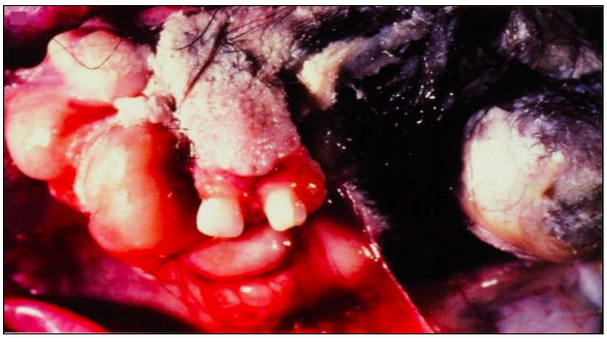
Gross:



Mature Cystic Teratoma

- This 4.0 cm dermoid cyst is filled with greasy material (keratin and sebaceous secretions) and shows tufts of hair.
- The rounded solid area at the bottom is called Rokitansky's protuberance.

Microscopically, it also showed foci of neural tissue (Immature Cystic teratoma).

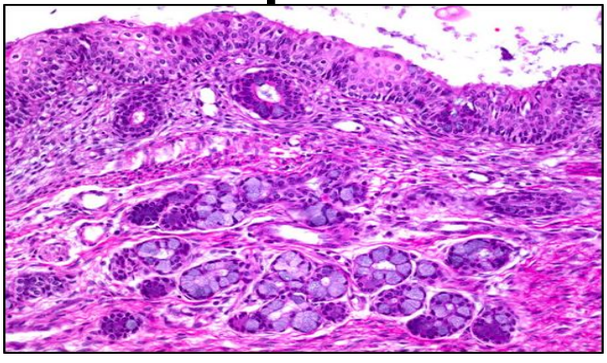


Mature Cystic Teratoma

There is:

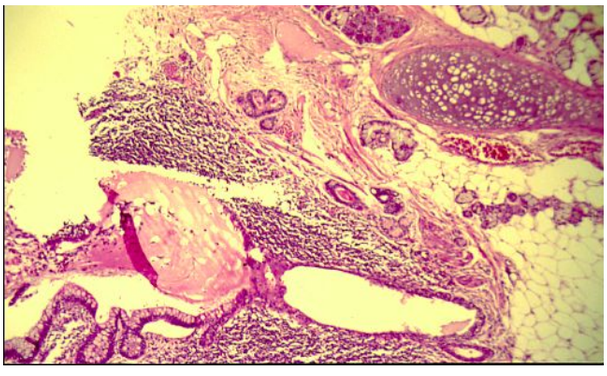
- Skin.
- Nail.
- Hairs.
- Teeth.

Microscopic:



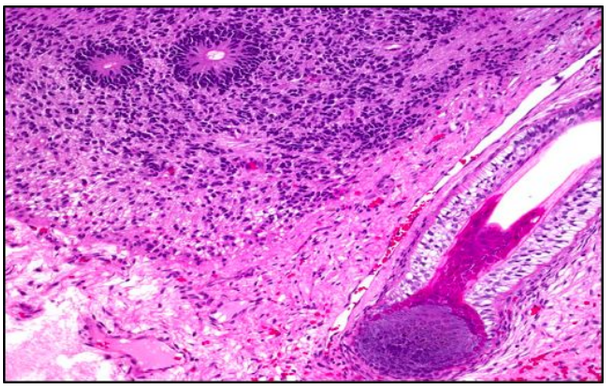
Mature Cystic Teratoma

This image shows skin and mucinous glands in a mature solid teratoma of the ovary.



Mature Cystic Teratoma, shows:

- Cartilage
- Fatty tissue.
- Columnar epithelium.
- Mucous and serous gland.



Immature Cystic Teratoma

Ovarian teratoma showing:

- Neuroepithelial tubules and rosettes (immature component) adjacent to a hair follicle (mature component).

- They consist of epidermis, hair follicles, sweat and sebaceous glands and neuroectodermal derivatives

ECTODERM (outer layer of embryo)

- Epidermis of skin and its derivatives (including sweat glands, hair follicles)
- Nervous and sensory systems
- Pituitary gland, adrenal medulla
- Jaws and teeth
- Germ cells

MESODERM (middle layer of embryo)

- Skeletal and muscular systems
- Circulatory and lymphatic systems
- Excretory and reproductive systems (except germ cells)
- Dermis of skin
- Adrenal cortex

ENDODERM (inner layer of embryo)

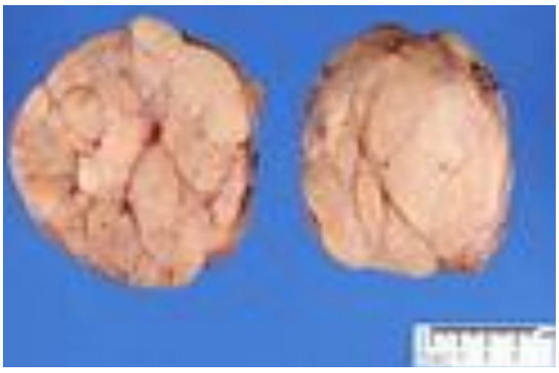
- Epithelial lining of digestive tract and associated organs (liver, pancreas)
- Epithelial lining of respiratory, excretory, and reproductive tracts and ducts
- Thymus, thyroid, and parathyroid glands

Male slides only.

Neoplasm	Peak Incidence	Usual Location	Morphologic Features	Behavior
Germ Cell Origin				
Dysgerminoma	Second to third decade of life Occur with gonadal dysgenesis	Unilateral in 80–90%	Counterpart of testicular seminoma Solid large to small gray masses Sheets or cords of large clear cells separated by scant fibrous strands Stroma may contain lymphocytes and occasional granulomas	All malignant but only one third aggressive and spread; all radiosensitive; 80% cure rate
Choriocarcinoma	First 3 decades of life	Unilateral	Identical to placental tumor Often small, hemorrhagic focus with two types of epithelium: cytotrophoblast and syncytiotrophoblast	Metastasizes early and widely. Primary focus may degenerate, leaving only metastases In contrast with gestational tumors, ovarian primaries are resistant to chemotherapy
Sex Cord Tumors				
Granulosa-theca cell	Most postmenopausal, but may occur at any age	Unilateral	May be tiny or large, gray to yellow (with cystic spaces) Composed of mixture of cuboidal granulosa cells in cords, sheets, or strands and spindled or plump lipid-laden theca cells Granulosa elements may recapitulate ovarian follicle as Call-Exner bodies	May elaborate large amounts of estrogen (from thecal elements) and so may promote endometrial or breast carcinoma Granulosa element may be malignant (5% to 25%)
Thecoma-fibroma	Any age	Unilateral	Solid gray fibrous cells to yellow (lipid-laden) plump thecal cells	Most hormonally inactive A few elaborate estrogens About 40%, for obscure reasons, produce ascites and hydrothorax (Meigs syndrome) Rarely malignant
Sertoli-Leydig cell	All ages	Unilateral	Usually small, gray to yellow-brown, and solid Recapitulates development of testis with tubules or cords and plump pink Sertoli cells	Many masculinizing or defeminizing Rarely malignant

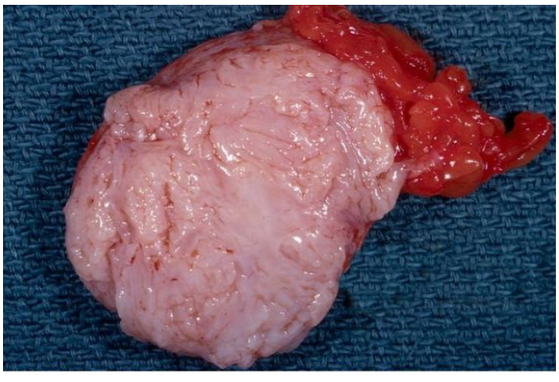
Case 16: Fibroadenoma of the Breast

Gross:



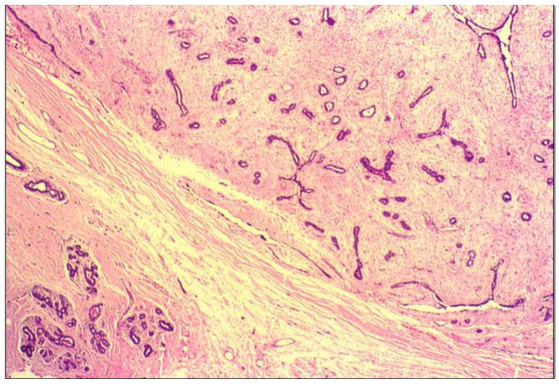
Fibroadenoma of the breast has a benign behavior with good prognosis.

Multiple fibroadenomas with smooth, circumscribed borders



- Well circumscribed bulging white mass.
- The cut surface is lobulated with slit-like spaces.

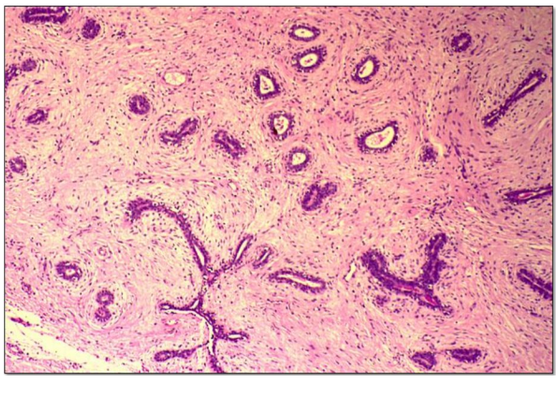
Microscopic:



A tumour shows:

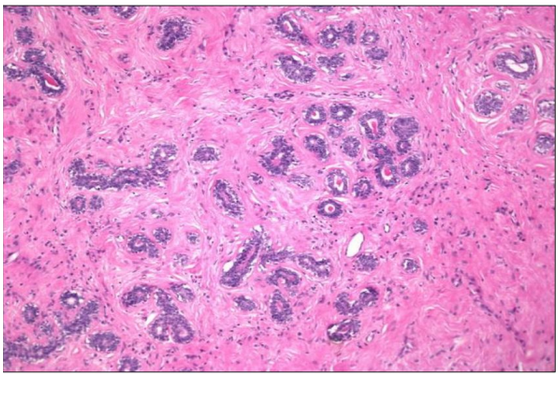
- Proliferation of both glandular tissue and fibrous tissue

- Intracanalicular and pericanalicular fibrous and ductular tissue growth pattern.



- Proliferation fibrous tissue is invaginating the ducts causing **elongation**, **compression**, **distortion** of the ducts which have slit-like lumen (intracanalicular).

- At places fibrous tissue is arranged around the ducts (pericanalicular) and does not invaginate.



Pericanalicular Fibroadenoma:

- The glands maintain their round or oval profiles.
- There is no prognostic or clinical significance attached to the pericanalicular and intracanalicular patterns.
- Both may be seen within the same lesion.

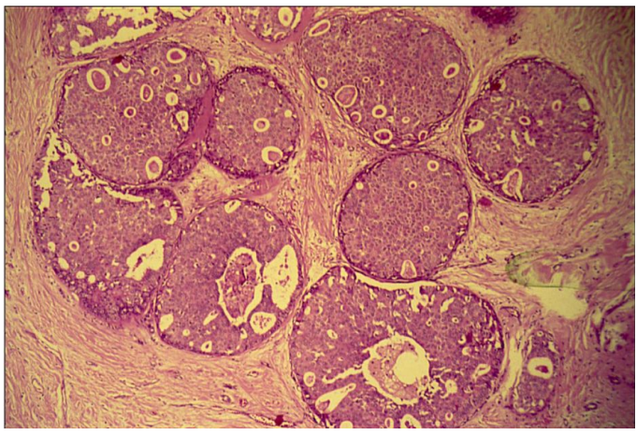
Case 17: Carcinoma of the breast

- Inverted nipple.
- Skin dimpling or retraction.

Gross Biopsy:

- Ill-defined pale and firm nodule
- Overlying retracted nipple surrounding skin.

Microscopic:

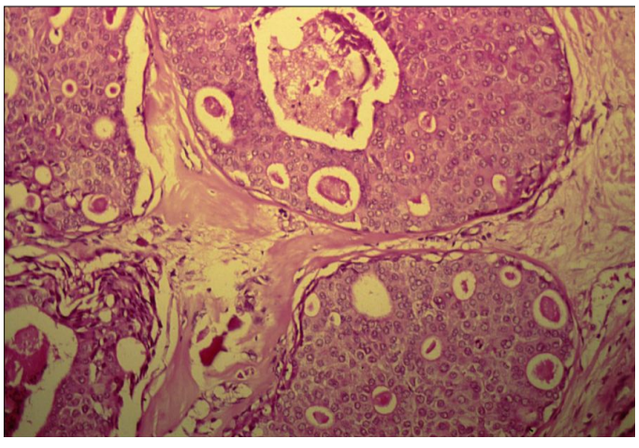


Intraductal (In-situ) Carcinoma of the Breast shows:

- Cells are forming imperfect acini and shows a cribriform pattern.

- Small groups of cells in the center of many ducts are necrotic.

- No invasion of basement membrane of the ducts.



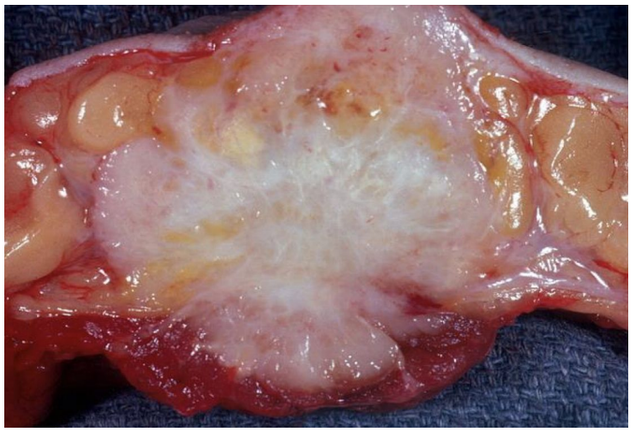
Intraductal Carcinoma of the Breast

Large ducts are distended by neoplastic epithelial cells which are :

- Pleomorphic
- Have large hyperchromatic nuclei
- Shows mitosis.

Case 18 : Invasive Ductal Carcinoma

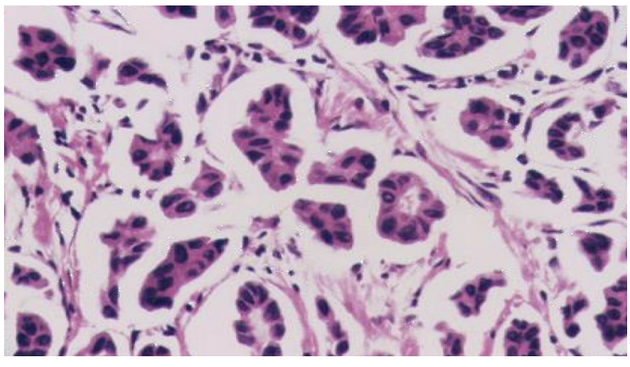
Gross:



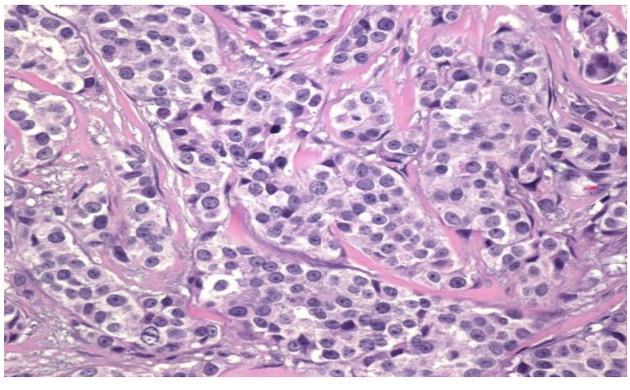
It shows:
- Yellowish gray cut surface
- Firm and poorly circumscribed Tumor
- Strands radiating into the surrounding fat.

“It cuts with a gritty sensation”

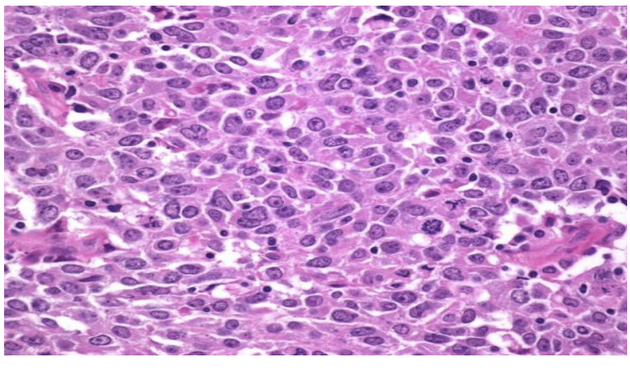
Microscope:



The picture shows:
- Well-differentiated ductal carcinoma made up of (small acini and glands)
- Round to polygonal tumour cells
- Deeply stained nuclei
- Occasional mitoses
- Mild Nuclear atypia



The picture shows:
- Cords and sheets of pleomorphic tumor cells.
- Surrounding dense fibrous stroma.
- Scattered lymphocytes.



The picture shows:
- High grade invasive ductal carcinoma
- Highly pleomorphic tumor cells
- Frequent mitotic figures
- Minimal tubular formation

Prognosis of breast cancers is influenced by the following variables the first three of which are components of the tumor-node-metastasis (TNM) staging classification:
Tumor invasion and size.
- Extent of lymph nodes involvement.
- Distant metastases.
- Histologic grade.
- Oestrogen and progesterone receptors.
- Overexpression of Her2-neu.

Case 19 : Paget's Disease of the Nipple

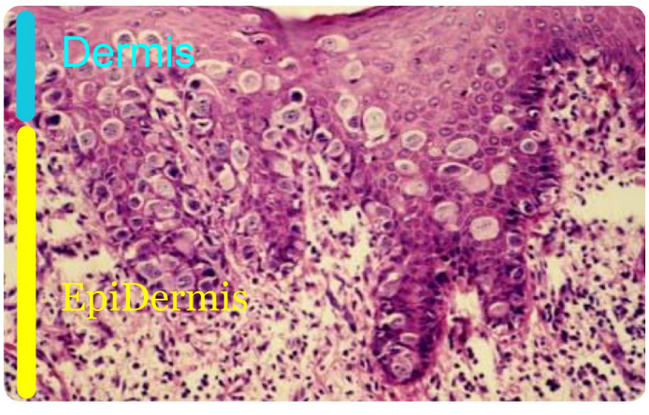
Gross:

Paget's disease is a **nipple lesion** associated with underlying ductal carcinoma-in-situ with or without associated stromal invasion.

Clinically, the lesion is eczema-like with hyperemia and erosion of the epidermis. Initially centered on the nipple, they may later involve the areola.

There is:
- Redness
- Hyperemia
- Erosion of the epidermis

Microscope:



The HPF shows paget's cells which have:
- Pale and vacuolated cytoplasm
- Large nuclei
- Migrate through the epidermis from parabasal cell layers upward.
- The highest concentration in the deep layers of epidermis.

The HPF shows:
- Hyperkeratosis of epidermis
- Chronic inflammation in the dermis (**Common**)
- Ulceration
- Invasion of epidermis by ductal carcinoma cells (Paget cells)
- Present between basal cells in elongated rete pegs.

Causes? Invasive ductal carcinoma or ductal carcinoma in-situ
If we took biopsy from the breast we will see? Invasive ductal carcinoma or ductal carcinoma in-situ

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تم بحمد الله .. اللهم اجعل خير أعمالنا خواتيمها

We wish you the best of luck