

TUMOURS OF DIFFERENT TISSUE



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CANCER CLASSIFICATION

Cancers may be classified in two way:

- **Classification by site of origin**

Depending on the location in the body where the cancer first developed, cancers may be of specific types like breast cancer, lung cancer, prostate cancer, liver cancer renal cell carcinoma (kidney cancer), oral cancer, brain cancer etc.

- **Classification by histological / tissue types:**

Depending on the type of tissue (histogenetic basis) i.e., according to the origin of cancerous cells

HISTOLOGICAL CLASSIFICATION OF TUMOUR

From a histological standpoint there are hundreds of different cancers, which are grouped into six major categories:

- Carcinoma
- Sarcoma
- Myeloma
- Leukemia
- Lymphoma
- Mixed Types

Classification of tumours

Tissue or origin	Benign	Malignant
Epithelial tumours		
1. Squamous epithelium	Squamous cell papilloma	Squamous cell carcinoma
2. Transitional epithelium	Transitional cell papilloma	Transitional cell carcinoma
3. Glandular epithelium	Adenoma	Adenocarcinoma
4. Basal cell layer skin	--	Basal cell carcinoma
5. Neuroectoderm	Naevus	Melanoma (melanocarcinoma)
6. Hepatocytes	Liver cell adenoma	Hepatoma (Hepatocellular carcinoma)
7. Placenta (chorionic epithelium)	Hydatidiform mole	Choriocarcinoma

Classification of tumours

Tissue or origin	Benign	Malignant
Non-epithelial (mesenchymal) tumours		
1. Adipose tissue	Lipoma	Liposarcoma
2. Adult fibrous tissue	Fibroma	Fibrosarcoma
3. Embryonic fibrous tissue	Myxoma	Myxosarcoma
4. Cartilage	Chondroma	Chondrosarcoma
5. bone	Osteoma	Osteosarcoma
6. Synovium	Benign synovioma	Synovial sarcoma
7. Smooth muscle	Leiomyoma	Leiomyosarcoma
8. Embryonic fibrous tissue	Rhabdomyoma	Rhabdomysarcoma

Classification of tumours

Tissue or origin	Benign	Malignant
Non-epithelial (mesenchymal) tumours		
9. Mesothelium	--	Mesothelioma
10. Blood vessels	Haemangioma	Angiosarcoma
11. Lymph vessels	Lymphangioma	Lymphangiosarcoma
12. Glomus	Glomus tumour	--
13. Meninges	Meningioma	Invasive meningioma
14. Haematopoietic cells	--	Leukaemias
15. Lymphoid tissue	Pseudolymphoma	Malignant lymphomas
16. Nerve sheath	Neurilemmoma, Neurofibroma	Neurogenic sarcoma
17. Nerve cells	Ganglioneuroma	Neuroblastoma

Classification of tumours

Tissue or origin	Benign	Malignant
Mixed Tumours		
Salivary glands	Pleomorphic adenoma	Malignant mixed salivary tumour
Tumours of more than one germ cell layer		
Totipotent cells in gonads or in embryonal rests	Mature teratoma	Immature teratoma

TUMOURS OF DIFFERENT TISSUE

TUMORS OF CONNECTIVE TISSUE

1. Fibroma & Fibrosarcoma
2. Myxoma & Myxosarcoma
3. Lipoma & Liposarcoma
4. Chondroma & Chondrosarcoma
5. Osteoma & Osteosarcoma
6. Histiosarcoma
7. Mast-Cell Tumour

TUMOURS OF EPITHELIAL TISSUE

1. Papilloma/Wart
2. Squamous Cell Carcinoma
3. Basal Cell Carcinoma
4. Adenoma
5. Seminoma

TUMOURS OF DIFFERENT TISSUE

TUMORS OF HAEMATPOITIC CELLS

1. Leukaemia
2. Multiple Myeloma
3. Leukosis/Sarcoma

TUMOURS OF ENDOTHELIAL & RELATED TISSUE

1. Haemangioma and
2. Haemangiosarcoma

TUMOURS OF DIFFERENT TISSUE

TUMORS OF NERVOUS TISSUE

1. Neuroblastoma
2. Pinealoma
3. Meningioma

TUMOURS OF MUSCLE

1. Leiomyoma & leiomyosarcoma
2. Rhabdomyoma & Rhabdomyosarcoma

TUMOURS OF CONNECTIVE TISSUE

I. FIBROMA & FIBROSARCOMA

Nasal polyps

It is an examples of soft fibroma (amount of collagen fibre are very less)

It occurs commonly in the nasal passage of horses.

Gingival fibroma

found along gum line and called as Epulus/Epuli

Equine Sarcoid

It arises from **fibrous connective tissue** and occurs in the head , neck and fore-legs of horses & mules.

It is indistinguishable from fibroma & Fibrosarcoma, as it recur after excision and doesn't metastasize

Neoplastic cells are usually arranged in a **whorled pattern of spindle-shaped cells**.

Rous sarcoma of poultry:

It is a tumor of connective tissue induced by RNA viruses

Shope fibroma of rabbit:

Described by Shope in 1933.

It is a tumour of spindle shaped cells of connective tissue caused by DNA oncogenic viruses.

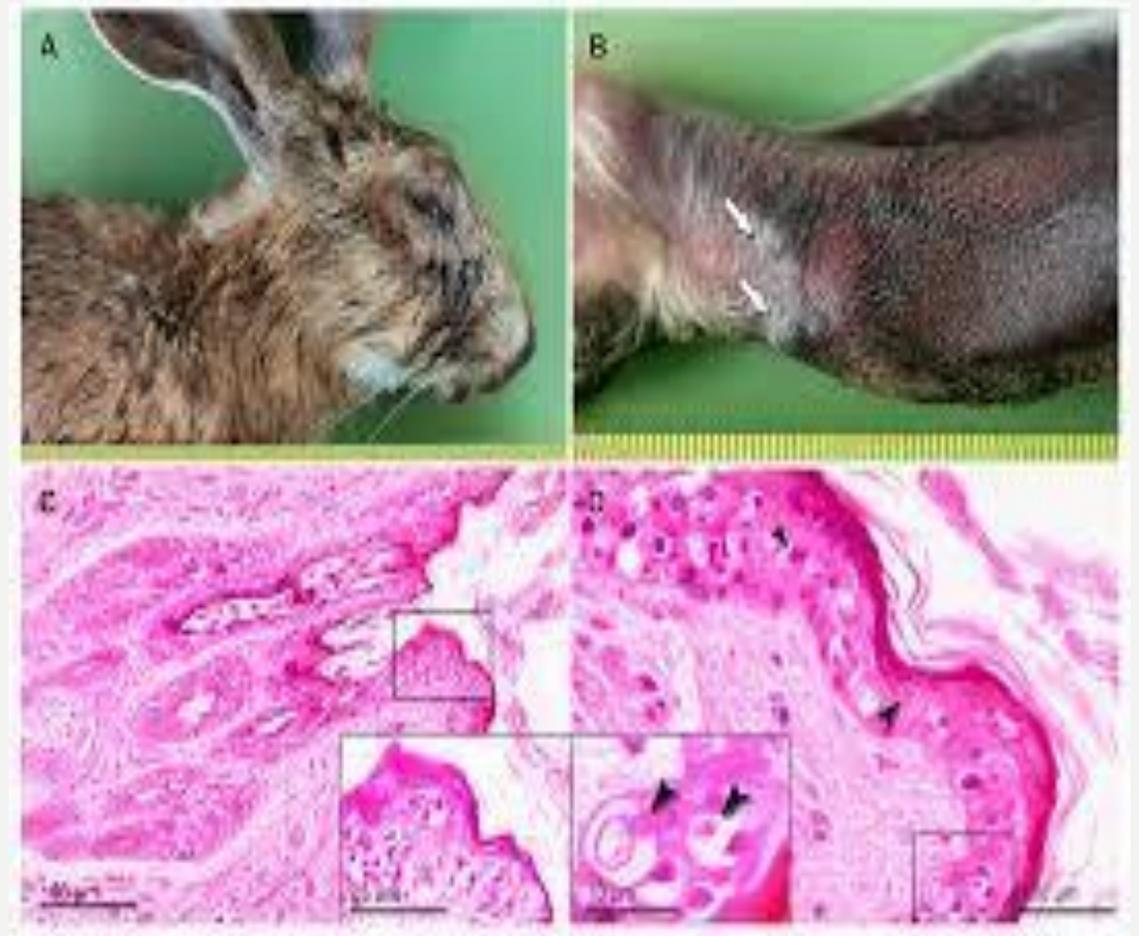
Occures as firm subcutaneous mass in rabbit



TUMOURS OF CONNECTIVE TISSUE

2. MYXOMA & MYXOSARCOMA

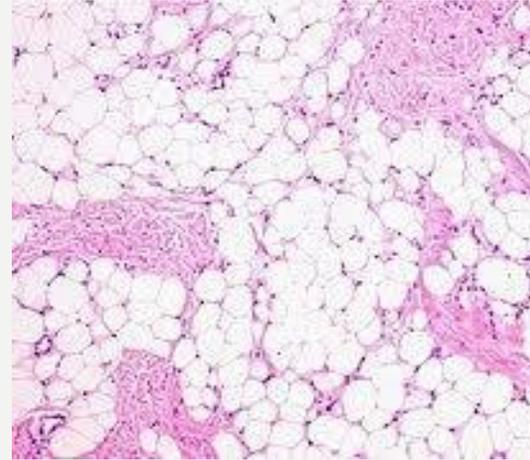
- These are tumours of connective tissue that are capable of producing mucin like material .
- **Infectious Myxomatosis of rabbits** is myxosarcoma caused by viruses and occurs as elevated nodular lesion on the head, neck and abdomen regions. These are tumours of connective tissue that are capable of producing mucin like material .



TUMOURS OF CONNECTIVE TISSUE

3. LIPOMA & LIPOSARCOMA

- It is chiefly a tumour of adipose tissue
- It occurs in older dogs.
- Lipoma is more common than Liposarcoma



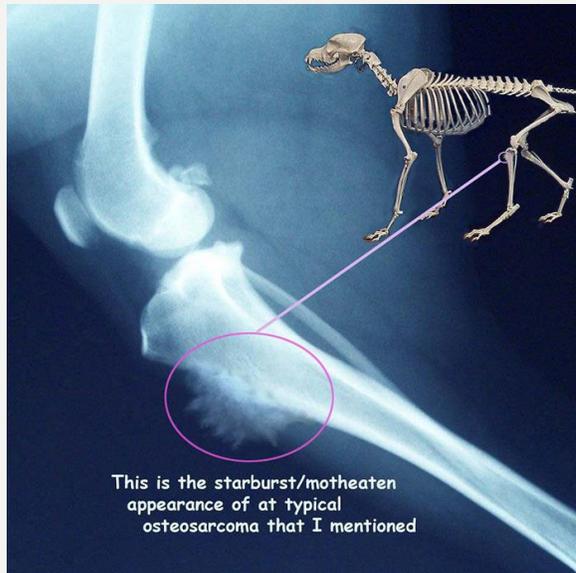
4. CHONDROMA & CHONDROSARCOMA

- These are tumours of primarily cartilaginous cells.
- Generally, it occurs at the epiphyses of long bones of extremities, costochondral and chondro-sternal junctions.
- Chondrosarcoma frequently metastasize to lungs, if left untreated.

TUMOURS OF CONNECTIVE TISSUE

6. OSTEOMA & OSTEOSARCOMA

- ✓ These are tumours of bone.
- ✓ **In animals, osteomas are rare** except in the dog.
- ✓ Osteosarcoma are also relatively more common in dogs and cats and occurred rarely in Horses and cattle .
- ✓ Osteoma must be differentiated from exostosis (inflammatory formation of bone)



TUMOURS OF CONNECTIVE TISSUE

7. HISTIOSARCOMA/ CANINE TRANSMISSIBLE VENEREAL TUMOUR (CTVT)

Synonyms:

Canine Venereal Granuloma/ Transmissible Infectious Sarcoma / Sticker Tumour /
Canine Condyloma / Transmissible Lymphosarcoma

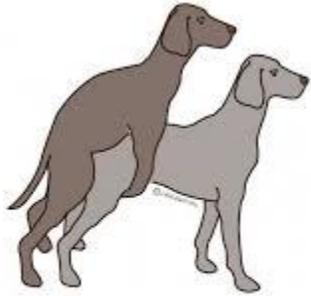
Historical Importance:

- It is the **first neoplasm to be successfully transplanted** from one animal to another.
- **M A Novinsky** -a Russian veterinarian was the first to demonstrate that it could be transplanted to other dog since the tumour in nature is spread by coitus is called when venereal (resulting from sexual intercourse) granuloma

- It is **composed of histiocytes**- Cells of connective tissue
- It **spreads during coitus** i.e., venereal
- Occurs in genital organ of dogs especially at glance penis/vagina
- It's a tumour of younger dogs (**1-6 Years of Age**)
- Common among Bitches
- Grossly**: vaginal mucosa is often red/ ulcerated/ protruded from vulva/ seems to be cauliflower like growth.
- Microscopically**: large round oval or polyhedral with in distinct count and poorly obtained cytoplasm in
H &E staining

TUMOURS OF CONNECTIVE TISSUE

7. HISTIOSARCOMA/ CANINE TRANSMITTABLE VENEREAL TUMOR (CTVT)



TVTs are sexually transmitted through skin-to-skin contact.

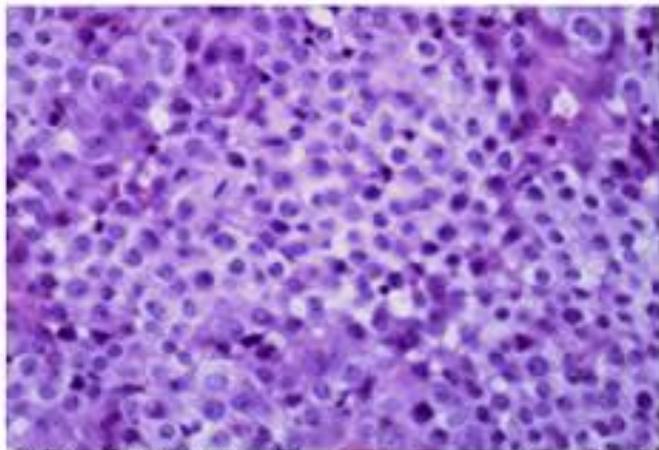
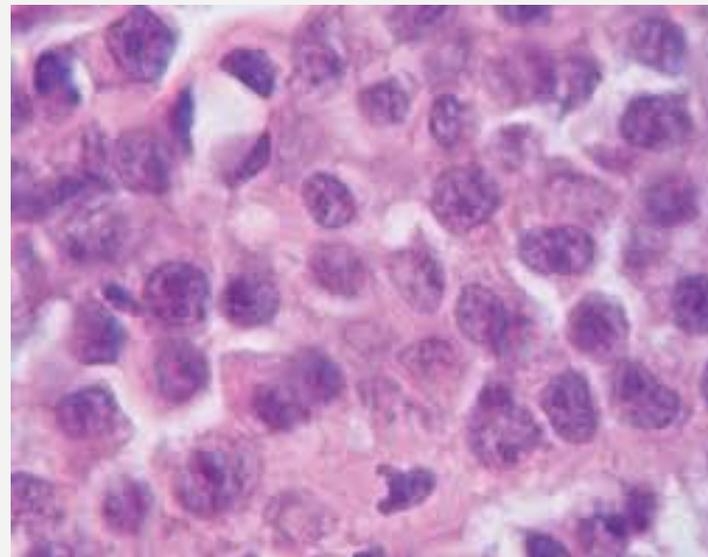


Fig.2. Genital CTVT (Dog 6). Tumor cells were round and had large, round vesicular nuclei with single prominent nucleoli and pale, amphophilic cytoplasm. Mitotic figures were frequent. HE, obj.40x.

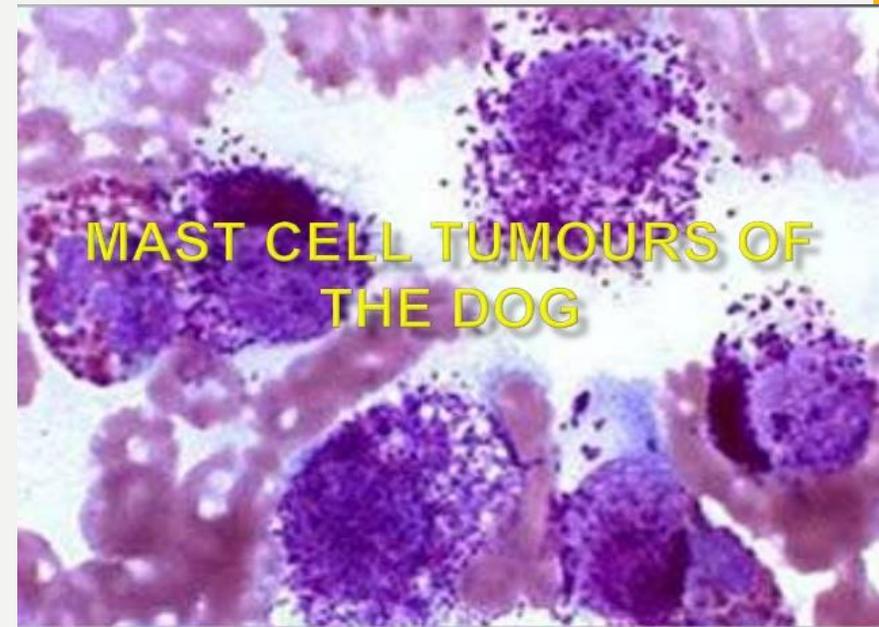


TUMOURS OF CONNECTIVE TISSUE

8. MAST-CELL TUMOURS

Synonyms: Mastosarcoma/ Mastocytoma

- It arises from the mast cell of connective tissue of skin
- Mast cells are produced from undifferentiated mesenchymal cells in connective tissue.
- It is **chiefly a tumour of the dog** and occasionally also of the cat.
- It usually **develops on thigh** and rarely on external genitalia.
- Tumour appears at latter **age between 6 to 15 year**



TUMOURS OF CONNECTIVE TISSUE

HISTIOSARCOMA

MAST-CELL TUMOUR

Metachromatic granules are not found	Metachromatic granules are found (H&E Staining)
Mitotic figures are numerous	Mitotic figures are Rare
Involves Genital Organs	Mostly seen in subcutaneous tissue of hind legs/thighs
Tumours of younger Female Dogs (1 to 6 year)	Tumours of Older Dogs (6 to 15 year)
Transmitted by Coitus	Usually, Does not transmits.

TUMOURS OF EPITHELIAL TISSUE

I. PAPILOMA/WART

A benign tumour of the St. Sq. epi. Of the skin or a mucous membrane.

Most common in cattle than any other domestic animals

Etiology: Bovine papilloma virus (BPV) or papilloma virus

Gross Lesion:

- Finger like (or nipple like or Horn like) projections from skin.
- Tumorous Growth is pedunculated
- size varies from few mm to 10 cm in diameter

Microscopic Lesion:

- Finger like processes of stratified squamous epithelium protruding above the surrounding epithelial surface and contain a connective tissue core.
- There is NO break the basal /basement layer



Bovine Papillomatosis



Canine Oral Papillomatosis

TUMOURS OF EPITHELIAL TISSUE

I. SQUAMOUS CELL CARCINOMA (SCC)

A malignant tumour of stratified squamous epithelium
It is a common tumour of cattle; for example

- SCC of eye in Herford cattle
- **SCC of Bovine Eye**
- **Horn cancer** in Bullock (castrated Bull)

Etiology: possibly viruses, chronic irritation, hormonal imbalance is the prime reason behind the horn cancer in castrated animals

Lesions

Macroscopic:

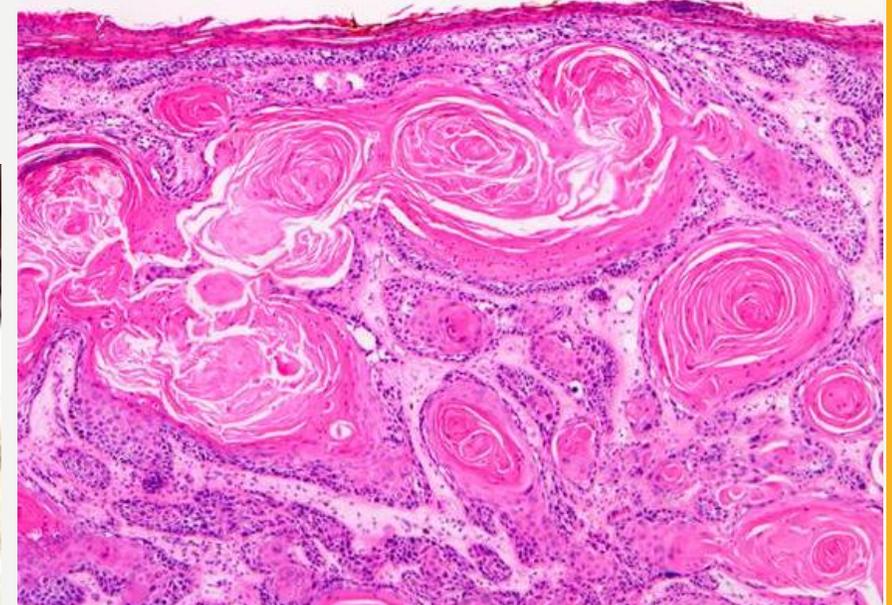
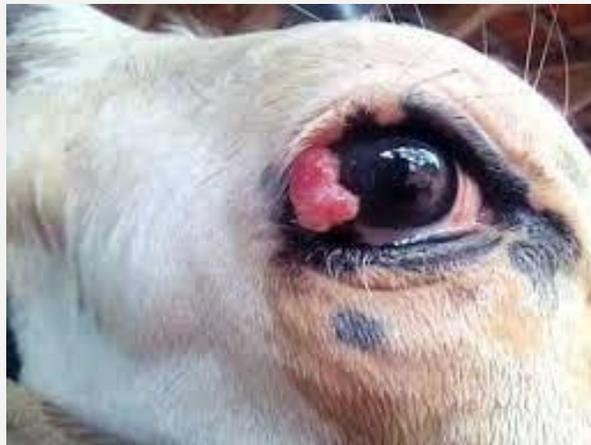
- resembles **Cauliflower head** in slow growing tumours

Microscopically:

- **Epithelial Pearl or Cell Nest**
- (round laminated structures
- arranged concentrically
- formed by keratinization
- of stratum corneum at
- centre).



The earliest sign if Horn Cancer is
a) Bending of horn, b) Tilting,
c) Scratching. d) Mobility

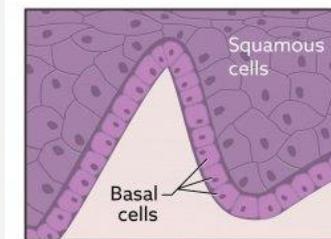


TUMOURS OF EPITHELIAL TISSUE

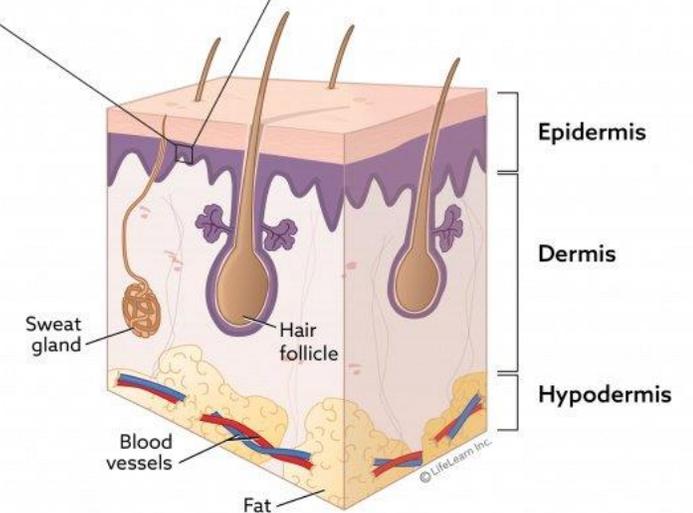
I. BASAL CELL CARCINOMA (BCC)

It is a most common form of skin cancer and begins in the basal cells — a type of cell within the skin (st. germinativum) that produces new skin cells as old ones die. Basal cell carcinoma often appears as a slightly transparent bump on the skin

- These are locally invasive but **never metastasize**.
- Etiology: Not Known
- it is most commonly found in **dog Horses and cat** on Head & Shoulder
- Tumor is also called as **rodent ulcer**
- Macroscopically:
 - - slow growing tumor
 - Firm and nodular attached by broad base
 - tumour surfaces ulcerated



Basal cell tumors form as a result of abnormal growth of the basal cells in the epidermis.



characterized by an area rimmed by a pearly border as if gnawed by a rodent.

TUMOURS OF EPITHELIAL TISSUE

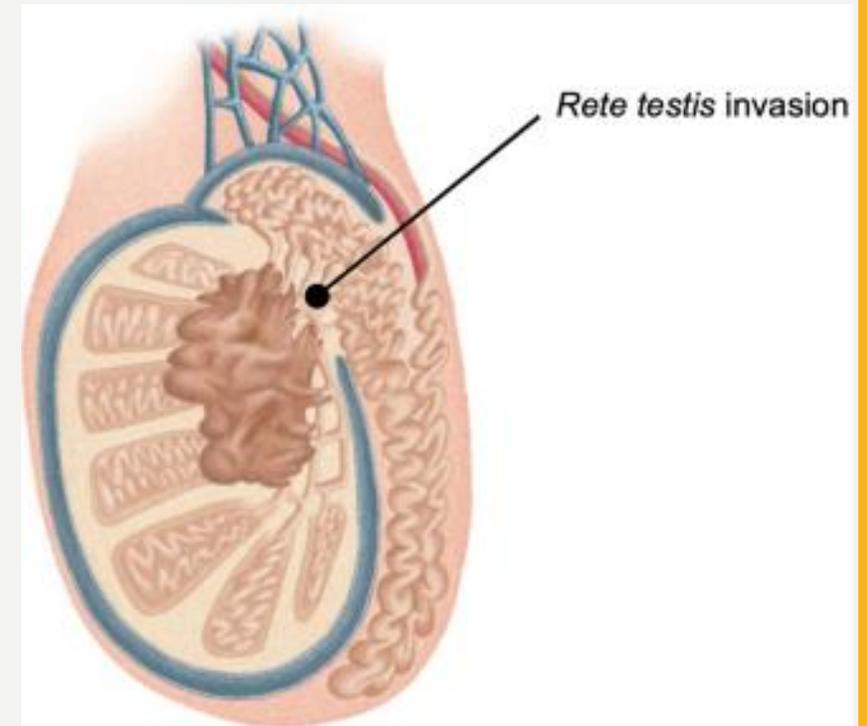
I. ADENOMA

- It is a benign tumour of glandular epithelium.
- In the Dog, like mammary, prostate, and sebaceous gland adenoma are fairly common.
- **Gross Appearance:**
- **Cystadenoma**
 - Mucinous **cystadenoma** arises from the surface epithelium of the glands wherein the secretions are retained in the acini
 - usually found in thyroid gland of older dogs and horses.
- **Papillary adenoma**
 - proliferating epithelium grows into the lumen of acini and forms branching papillae
- **Polypoid adenoma**
 - Sharply circumscribed and encapsulated polyps in the stomach and intestine are common.

TUMOURS OF EPITHELIAL TISSUE

I. SEMINOMA

- ❑ It is **adenocarcinoma** of testicular tissue arising from germinal epithelium of seminiferous tubule.
- ❑ They occur mostly in older dogs and vary from 1-3 cm in diameter.
- ❑ Metastases occur in the regional lymph nodes and other organs.
- ❑ Sustentacular cell tumour (Sertoli cell tumour) and Interstitial cell tumour (Leydig cell tumour) are another examples tumours of testicular tumour.



A histological slide of skin tissue, likely stained with hematoxylin and eosin (H&E). The image shows a cross-section of the epidermis and dermis. The epidermis is characterized by a thick, stratified layer of keratinized cells, with a prominent, wavy, pink-stained keratin layer at the surface. The underlying dermis contains various cellular structures, including what appears to be a hair follicle and other skin appendages. The overall appearance is that of a well-developed, possibly inflamed or hyperkeratotic, skin tissue.

THANKS

REFERENCE:

BOOK- A Textbook of Veterinary General Pathology. by J. L. Vegad

Image used for illustration had been taken from google image.