

Skin and Appendages - 3

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ARTHROPOD ECTOPARASITES

- **Myiasis**
 - Myiasis is the infestation of the tissue of living animals with the **larvae** of **dipterous flies**.
 - The larvae are referred to as **maggots**
 - The **larvae feed** on **host tissues** and eventually drop to the ground to pupate
 - Warbles caused by ***Hypoderma bovis*** and ***Hypodertna lineatum*** occur chiefly in cattle
 - Warble flies are also known as heel flies because the eggs are deposited predominantly on the hair of the legs.
 - Larvae emerge 4-6 days later and burrow directly into the skin or into hair follicles causing minimal irritation
 - Histologically, the cellular reaction is predominantly eosinophilic and lymphocytic.

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Photograph / Copyright - Jason Venus Secret World
Same carcass 24 hours later illustrating the speed of maggot development.

http://wildpro.twycrosszoo.org/S/00Man/UKFirstAidandCare/Img_diseases/sw30jv.jpg

- **Screwworm myiasis**
 - Members of the **Calliphoridae** also cause myiasis
 - The disease occurs in Africa, Asia, Central and South America and Mexico
 - *Screwworm myiasis affects all domestic animals and humans and is an important cause of mortality in wildlife*
- Infestation with **lice** is called **pediculosis**
 - *Most lesions result from skin irritation and resultant pruritus*
 - *Sucking lice may induce anemia*, which is occasionally fatal in heavily infested animals.
 - Weight loss and decreased milk production are associated with the constant irritation seen in some lice infestations.

- Fleas are chiefly a problem in cats, dogs, pigs, and humans.
 - Some animals may develop **flea bite dermatitis**
 - **Flea allergy dermatitis** is an extremely common and very important disease of the dog and cat
- **Sarcoptic mange**
 - **Sarcoptes scabiei** is responsible for scabies in man and sarcoptic mange in domestic animals worldwide.
 - Scabies has also been reported to cause severe disease in a number of wildlife species.
 - disease occurs in cattle and goats
 - The *pathogenesis* of lesions in *S. scabiei* infestation is due to *direct damage* inflicted by the parasite mechanically, by the *irritant effects* of its secretions and excreta,
 - and by an *allergic reaction* developed against components of the mite or one or more of the extracellular products of the parasite.



<http://www.yankee-shelties.com/images/sarcopticmange.jpg>

- **Psoroptic mange**
 - The psoroptic mites infest *sheep, cattle, horses, rabbits, and goats* as well as other nondomestic species.
 - In **cattle**, psoroptic mange is sometimes referred to as "**cattle scabies**."
 - Lesions in naturally affected cattle usually commence at the **poll, withers** or at **the base of the tail**
 - and chiefly result from **persistent licking, rubbing** and **scratching** induced by **pruritus**.
 - Infested areas are fairly well defined as areas of **alopecia**.
 - Alopecic areas are covered by **dry gray crusts** and **scales**.
 - Severely affected calves may develop mild **anemia, lymphopenia** and marked **neutropenia**

- **Demodectic mange**
 - **Demodex mites** are normal inhabitants of the hair follicles and sebaceous glands in most species of domestic animals and in humans.
 - Demodectic mange in **cattle** occurs worldwide
 - Typical gross lesions are **multiple cutaneous papules or nodules**, usually between 2-4 mm diameter and occasionally reaching 1cm or more.
 - **Nodules** vary in number from a **few** to several **hundred**
 - The preferred sites are the **shoulders, neck, dewlap, and muzzle**
 - The content of the nodules is thick, waxy or **caseous material**, sometimes **stained** with **blood**.
 - *Histologically, the nodules are follicular cysts lined by a flattened squamous epithelium and filled with keratin squamous and large numbers of mites.*

- *Ticks are most important as vectors for a large number of serious viral, bacterial and protozoal diseases of domestic animals.*
 - Primary tick bite lesions are papules and wheals, which proceed to focal areas of necrosis with crusts, erosions and ulcers and lead to focal alopecia
 - Severe hypersensitivity reactions to *Boophilus microplus* have been described in horses
 - Tick infestation in lambs leading to secondary staphylococcal septicemia can result in high mortality

HELMINTH DISEASES OF SKIN

Bovine cutaneous onchocerciasis

- Cattle infested with *O. gibsoni* develop multiple subcutaneous papules and nodules of ~2cm diameter, although lesions up to 9 cm are recorded.
- Lesions may be hard or soft depending on the degree of mineralization and fibrosis or the degree of caseation and suppuration.
- Lesions predominantly affect the brisket but also the stifle and hip.
- Histologic assessment of *O. gibsoni* nodules revealed dead worms and associated degenerative changes such as mineralization in ~30% of nodules.
- Eosinophilic infiltration was more marked around viable worms

Laminitis

- *The separation of the distal phalanx (coffin bone, P3) from the inner hoof wall is responsible for the severe clinical signs in laminitis*
- *Laminitis is one of the most devastating of equine diseases, often leading to chronic debilitation*
- Laminitis occurs sporadically in dairy cows, heifers, fattening cattle, and young bulls.
- In cattle, carbohydrate overload is also an important predisposing cause of laminitis.

NEOPLASTIC AND REACTIVE DISEASES OF THE SKIN AND MAMMARY GLANDS

Infundibular cysts (epidermoid cyst, epidermal cyst)

- are seen as single or multiple, smooth, most often unilocular, spherical dermal nodules seldom larger than 1 cm in diameter.
- *Each nodule consists of an orderly wall of stratified squamous epithelium identical to epidermis, with gradual keratinization at its luminal surface*
- *The cyst lumen is filled with concentric laminations of keratin.*

Tumors of the epidermis

Papilloma and fibropapilloma

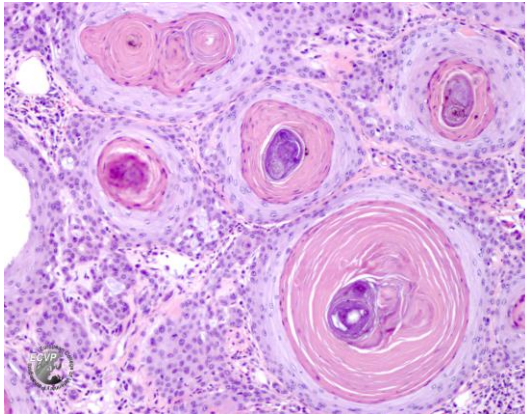
- Most papillomas are caused by infection with a host- and often site-specific *papillomavirus* of the family Papovaviridae
- In general, papillomaviruses induce two types of cutaneous lesions - squamous papilloma and fibropapilloma

Squamous cell carcinoma

- is a relatively *common*, locally invasive and occasionally metastatic neoplasm of most domestic species.
- *Sunlight* is probably the most important carcinogenic stimulus for these tumors
- Squamous cell carcinomas are usually firm, white, poorly demarcated dermal masses that are ulcerated and streaked with red.



http://www.merckvetmanual.com/mvm/zk/multimedia/v4733177.html?Ref=t&ItemId=v4733177&RefId=eye_and_ear/neoplasia_of_the_eye_and_associated_structures/ocular_neoplasia_in_cattle&Speed=256&Plugin=WMP&Error=



<http://www.ecvpath.org/wp-content/uploads/2012/08/Squamous-cell-carcinoma1.jpg>

Basal cell tumor

- They are the most common skin tumor of cats.
- Tumors comprised only of proliferations of undifferentiated basaloid cells
- Histologically, basal cell tumors are composed of cords or nests of cells resembling those of normal *stratum germinativum*.

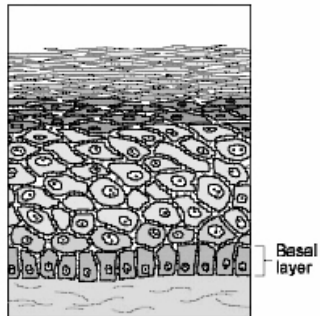
Tumors with adnexal differentiation

Trichoepithelioma

- is a tumor of primitive *hair germ* that exhibits rudimentary differentiation towards all three segments of the follicle

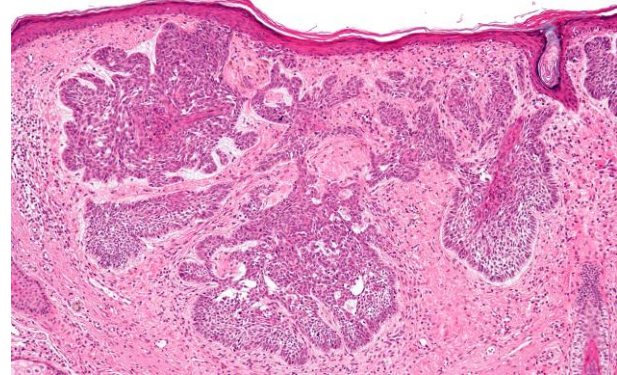
Trichoblastoma

- is a benign tumor derived from the primitive hair germ of embryonic follicular development



Cross Section of Epidermis
(outer layer of skin)

<http://www.vcahospitals.com/main/pet-health-information/article/animal-health/skin-basal-cell-tumors/585>



http://upload.wikimedia.org/wikipedia/commons/9/9c/Basal_cell_carcinoma_-_2_-_intermed_mag.jpg

Sebaceous adenoma

- is comprised primarily of mature sebaceous cells,

Sebaceous carcinomas

- are occasionally encountered in dogs and rarely in cats.
- Sebaceous carcinomas are locally infiltrative, solitary, poorly circumscribed tumors made up of pleomorphic cells that show some evidence of sebaceous differentiation.

Apocrine gland carcinomas

Apocrine ductal adenomas and ductal carcinomas

Melanocytic tumors

- Melanocytoma (benign melanoma, melanocytic nevus)
- Malignant melanoma (*melanosarcoma*)

Spindle cell tumors

- Fibromas
- Fibrosarcomas
- Lipomas
- Liposarcomas

Vascular tumors

- Hemangioma
- Hemangiosarcoma,
- lymphangioma
- lymphangiosarcoma

Mast cell tumors

- Cutaneous lymphoma
- Cutaneous plasmacytoma
- Merkel cell tumor

Tumors of the mammary gland

adenomas

carcinoma