©Copyright reserved

Cutaneous Neoplasia: Part 2

Dr Rick Last BVSc, MMedVet(Path)
– Specialist Veterinary Pathologist

3.2.5 Cutaneous epitheliotropic T-cell lymphoma (CTCL)

Cutaneous epitheliotropic lymphomas are documented in dogs, cats, horses, cats, rabbits and cattle.

They are usually reported in older dogs, but are rare in cats.

Various clinical presentations are described:

- Generalised pruritic erythema and scaling (exfoliative erythroderma). Beware this form can closely mimic other exfoliative inflammatory skin diseases.
- Mucocutaneous ulceration and depigmentation most frequently involving the facial mucocutaneous junctions of the mouth, planum nasale and eyelids (differentials discoid lupus erythematosis, nasal mucocutaneous pyoderma, nasal dermatophytosis). Localised involvement restricted to the lips is common.
- Solitary or multiple plaques or nodules with concurrent lymphadenopathy in advanced disease.
- Ulcerative disease of the oral mucosa usually involving gingivae, palate or tongue.
- Extremely rare vesiculobullous form resembling autoimmune blistering skin diseases.

3.2.5 Cutaneous non-epitheliotropic lymphoma.

Indolent form of cutaneous lymphoma most commonly reported in dogs and cats. In cats median age of ~12 years. Clinical presentation is areas of alopecia, scaling, erythema, ulcers, pruritus. Skin lesions are common on the lateral thorax and nasal planum, but can occur anywhere. Lesions can progress slowly with infiltration into internal organs or in rare instances can develop into a high grade lymphoma.

3.2.6 Cutaneous mast cell tumours (MCT's).

Canine dermal MCT's

They are reported to account for ~ 15-20% of all dermal neoplasms in canines. More common in dogs, but can occur in cats. There are breed predispositions with significantly higher number of MCT's reported in boxers, terriers, Labrador retrievers, beagles, schnauzers and Shar-pei's.

Clinical presentation is that of a fluctuating nodule with oedema, erythema and frequently pruritis. Tumours sometimes exhibit regions of tumoural necrosis. Gastroduodenal ulceration has been described in disseminated disease.

The histopathological grading system most widely employed for dermal cutaneous MCT's is termed the two-tier grading system (Kuipel system). Mast cell tumour metastasis and tumour-related deaths are significantly associated with amended WHO clinical stage, history of tumour recurrence, Kuipel histological grade, predominant histological organisation of neoplastic cells (cords versus sheets), mitotic index, Ki-67 labelling index, KITr IHC labelling pattern and c-KIT mutational status. The amended WHO clinical stage and history of tumour recurrence are independent predictors of overall survival.

Canine Cutaneous Mast Cell Neoplasia.
Surgical Excision Confirmed

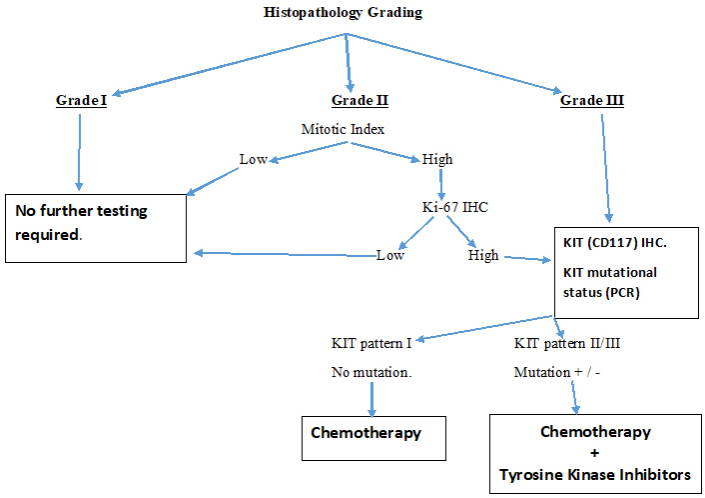

Figure 7.
Histopathology grading and further testing of cutaneous mast cell tumour.

Canine subcutaneous MCT

MCT's restricted to the subcutis, with no involvement of the dermis, are not graded like dermal cutaneous MCT. Grading is predominantly based on mitotic index, evidence of invasion and IHC characteristics.

- MI <4 is favourable
- MI >4 worse prognosis
- IHC profile C-KIT, Ki-67 (proliferation index)

Feline cutaneous MCT

Cutaneous mast cell tumours of cats are classified into 3 groups.

- Well-differentiated mast cell tumours are the most common type in cats. In general cutaneous mast cell tumours of cats carry a good prognosis, provided complete surgical excision can be achieved. Tumours are most commonly reported in cats 9-11 years of age.
- Atypical poorly granulated mast cell tumours, are usually multiple, mostly benign, and reported in young cats 1-4 years.

July 2020

- Pleomorphic mast cell tumours are uncommon, reported in cats 6-19 years of age and some are malignant. Mitotic index, Ki-67 proliferation index, c-Kit immunoreactivity scores are higher with this group compared to the 1st two groups.

3.2.7 Melanocytoma

These benign cutaneous tumours are found in most species, however they are most common in dogs, horses and pigs. They are usually solitary masses and have a MI <3 per 10 HPF's. In horses they may have some pleomorphism and a slightly increased mitotic index. These tumours are amenable to complete surgical excision, which is usually curative. Histopathology is required to differentiate between melanoma and melanocytoma neoplasms.

3.2.8 Melanoma (malignant melanoma).

Malignant cutaneous melanomas are found in most species, however they are most common in dogs, horses and pigs. They are well documented in older grey horses with a predilection site for the perineum, genital area and distal limbs. However, it is difficult to determine course of malignancy based on the histopathology, but all eventually progress with distant metastatic spread.

In dogs malignant melanomas can recur locally and metastasise to the regional lymph nodes and lungs.

A mitotic index >3 per 10 HPF's and/or marked pleomorphism, are significant negative prognostic indicators.

4. Benign and malignant mesenchymal neoplasms.

4.1 Sarcoids (bovine papillomaviruses)

Sarcoids are found in horses, cats and African lions and in all species are associated with infection by bovine papillomaviruses. Equine sarcoids are the most common skin tumours of horses.

Tumours are associated with equine adapted strains of BPV 1, 2 and 13. They are locally aggressive but generally non-metastatic, but they do have the potential to transform into malignant spindle cell neoplasms. There is a breed predisposition for quarter horses, thoroughbreds, appaloosas and Arabians.

Anatomical sites of predilection are the head, legs and ventral trunk. There are various clinical types including verrucous, nodular and occult. Feline sarcoids are rare, but have been reported in domestic cats and African lions. In felines sarcoids are associated with novel bovine papillomavirus (feline sarcoid associated PV).

Anatomical predilection sites include the nose, lips and digits. Local recurrence is common, but metastasis has not been documented.

4.2 Mesenchymal spindle cell tumours.

4.3 Feline fibrosarcoma.

These tumours are typically reported in adult and aged cats, with an anatomical site predilection for the head, withers and limbs. Other variants of this tumour include;

- FeSV (feline sarcomavirus) associated fibrosarcoma, a mutant of feline leukaemia virus. These tumours may occur at an earlier age (even in cats only a few months old). They are usually multicentric and can metastasise.
- Injection site sarcomas are more commonly seen in the USA. These variants are aggressive, recurrent and metastatic with a high mortality rate. They arise at vaccine or injection sites (e.g. neck, thorax, lumbar region, flank and limbs).

4.4 Other mesenchymal tumours.

4.4.1 Lipomas

Very common cutaneous neoplasms of dogs, which are usually multicentric but amenable to complete surgical excision.

Types	Grading Scheme	Outcome
Benign •Fibromas •Fibrolipomas •Myxomas •Piloleiomyoma	No grading scheme	Amenable to complete surgical excision
Malignant **Soft Tissue Sarcomas (STS)** •Canine perivascular wall tumour (haemangiopericytoma) •Peripheral nerve sheath tumour •Fibrosarcoma •Myxosarcoma	•These neoplasms are graded based on their cellular differentiation, mitotic index and regions of necrosis •The grading scheme consists of a grade 1, grade 2 and grade 3 •More research is required to adequately determine prognostic indicators for clinicians.	**Grade 1**: -Metastasis rare -Recurrence is infrequent with close margins and rare with complete margins **Grade 2**: -Metastasis is rare to infrequent -Recurrence has an intermittent frequency with close margins and rare with complete margins **Grade 3**: -Higher propensity for metastasis -Recurrence is likely with close margins and infrequently occurs with complete margins

Figure 8. Cutaneous mesenchymal tumours.

4.4.2 Infiltrative lipomas

Uncommon cutaneous tumours, which are locally infiltrative, but do not metastasise. Complete surgical excision is required, however this can be difficult with extensive locally infiltrative growth patterns resulting in euthanasia in some cases.

4.4.3 Liposarcoma

These are rare cutaneous tumours. Local recurrence is common but distant metastasis considered rare. They are considered a member of the soft tissue sarcomas and graded accordingly.

4.4.4 Haemangioma

Benign tumours that are amenable to complete surgical excision. They occur in animals of all ages and occur more commonly in lightly pigmented or sparsely haired regions of the body. It has been suggested they may be associated with chronic solar damage. They may be raised or flat.

4.4.5 Haemangiosarcoma

Malignant cutaneous tumours, occurring within the dermis or the subcutis. Primary cutaneous haemangiosarcomas are less aggressive than their visceral counterparts, with lower metastatic potential and longer survival times.

Depth and degree of infiltration has major prognostic significance with those invading the subcutaneous fat and muscle being prone to early metastasis and shorter survival times, while those restricted to the dermis with clear surgical margins usually have favourable prognosis.

Frequently associated with lightly pigmented or sparsely haired regions, and often seen concurrently with solar dermatosis.

4.5 Metastatic cutaneous tumours.

Dermal metastasis is relatively rare, however may need to be considered based on the clinical history. The more common metastatic cutaneous tumours include urothelial carcinoma (transitional cell carcinoma), prostatic carcinoma, visceral haemangiosarcoma, mammary gland adenocarcinoma and pulmonary carcinoma. Remember, spread to the skin can occur via surgical translocation.

Cutaneous paraneoplastic syndromes.

Paraneoplastic syndromes are systemic complications of neoplasia that are remote to the primary tumour. Effects of the paraneoplastic syndrome maybe more severe than the effects of the primary tumour. Cutaneous paraneoplastic syndromes are frequently initially presented for their skin disease, rather than the primary tumour.

Cutaneous Paraneoplastic Syndrome	Associated Neoplasia
Paraneoplastic pemphigus	Lymphoma
Alopecia	Pancreatic carcinoma (cat)
Necrotic migratory erythema (NME) – hepato-cutaneous syndrome	Liver and / or pancreatic neoplasia

Figure 9. Cutaneous paraneoplastic syndromes.

REFERENCES.

1. Jubb, Kennedy & Palmer. 2016. *Pathology of Domestic Animals.* 6th edition. Elsevier Publishing.
2. Kuipel. 2018. *Surgical Pathology of Tumours of Domestic Animals. Volume 1: Epithelial Tumours of the Skin*. 4th edition. Davis-Thompson DVM Foundation.
3. Lee Gross, Ihrke, Walder & Affolter. 2005. *Skin Diseases of the Dog and Cat*. 2nd edition. Blackwell Publishing.
4. Meuten. 2017. *Tumors in domestic animals*. 5th edition. Wiley Blackwell Publishing.

The SAVA Stress Management Hotline is there to assist members who are experiencing personal problems by offering access to professional counselling/advice.

The hotline can assist with referrals or simply offer much needed emotional support when anxiety, depression, anger, grief, loneliness and fear are at their highest.

The following SAVA members are available on the SAVA stress management hotline. If required, they will refer you to professionals.

Ken Pettey	082 882 7356	ken.pettey@up.ac.za
Tod Collins	083 350 1662	collins@nudvet.co.za
Aileen Pypers	072 599 8737	aileen.vet@gmail.com
Willem Schultheiss	082 323 7019	willem.schultheiss@ceva.com
Nico Schutte	023 626 3516	doknico@tiscali.co.za
Ian Alleman	072 558 4883	accommodation@nieu-bethesda.com
Ellené Kleyn	082 881 8661	elly1@mweb.co.za
Mike Lowry	084 581 2624	mikelowry@sai.co.za

QUESTION 1

Which of the following is NOT a documented clinical presentation of canine cutaneous T cell epitheliotropic lymphoma?

a. Generalised pruritic erythema and scaling (exfoliative erythroderma)
b. Localised involvement restricted to the lips
c. Solitary or multiple cutaneous plaques or nodules with concurrent lymphadenopathy
d. Ulcerative disease of the rectal mucosa
e. Vesiculobullous blistering skin disease

QUESTION 2

Which of the following ARE considered independent predictors of overall survival with dermal mast cell tumours?

a. Mitotic index
b. History of tumour recurrence
c. Ki-67 proliferation index
d. C-KIT mutational status
e. Histological organisation of neoplastic cells

QUESTION 3

Grading of subcutaneous mast cell tumours is predominantly based ON WHICH of the following?

a. Mitotic index
b. History of tumour recurrence
c. Ki-67 proliferation index
d. C-KIT mutational status
e. Amended WHO clinical stage

QUESTION 4

In which of the following horses are cutaneous melanomas MOST LIKELY to be encountered?

a. Old chestnut horses
b. Young bay horses
c. Palominos
d. Old grey horses
e. Paint horses

QUESTION 5

Which of the following papillomaviruses ARE THE CAUSE of sarcoids in animals?

a. Equine papillomaviruses
b. Bovine papillomaviruses
c. Canine papillomavirus
d. Feline papillomavirus
e. Caprine papillomavirus

QUESTION 6

Which of the following tumours is NOT a member of the canine soft tissue sarcomas (STS)?

a. Haemangiopericytoma
b. Fibrosarcoma
c. Fibrolipoma
d. Peripheral nerve sheath tumour
e. Myxosarcoma

QUESTION 7

In the cat, at which of the following anatomical locations would you NOT expect to find an injection site sarcoma?

a. Neck
b. Flanks
c. Thorax
d. Lumbar region
e. Tail

QUESTION 8

Which of the following pathological features would be considered the MOST SIGNIFICANT negative prognostic indicator for cutaneous haemangiosarcoma?

a. Mitotic index
b. Ulceration of the overlying epidermis
c. Narrow tumour free margins
d. Location of the tumour in the subcuti
e. Tumours located on the ventral abdomen

QUESTION 9

Which of the following tumours are NOT associated with cutaneous metastasis?

a. Renal adenoma
b. Urothelial carcinoma
c. Visceral haemangiosarcoma
d. Mammary gland adenocarcinoma
e. Pulmonary carcinoma

QUESTION 10

Which of the following tumours HAS been associated with paraneoplastic cutaneous pemphigus?

a. Anal sac gland adenocarcinoma.
b. Lymphoma.
c. Pancreatic adenocarcinoma.
d. Hepatocellular carcinoma.
e. Osteosarcoma

SAVC CPD Accreditation Code: AC/2288/19
To answer the questions and obtain your CPD points for this article visit the Online On Demand Journals page on www.veted.online.