Fall 2013

VPM 221 Systemic Pathology I
Pathology of Skin

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http://wwwmattsfacts.blogspot.ca/2009/03/albino-animals_05.html
Primary or Secondary skin lesions

**Primary**
- Macule/patch
- Papule/Plaque
- Nodule
- Tumour
- Vesicle/bulla
- Pustule
- Abscess

**Primary or Secondary**
- Scales
- Crusts
- Alopecia
- Erythema
- Hyper or hypo-pigmentation

**Secondary**
- Epidermal collarette
- Erosion/Ulcer
- Excoriation
- Scar
- Lichenification
- Callus

Shannon Martinson
Don’t forget the basics!

Step 1
- Look at the specimen: Is it normal or abnormal

Step 2
- What’s the abnormal part?

Step 3
- Describe the abnormal part

Step 4
- Interpret the changes (give a morphologic diagnosis)

• Description:
  - Distribution
  - Contour
  - Shape
  - Size
  - Consistency/texture
  - Special features
  - Extent

• Morphologic Diagnosis:
  - Organ
  - Exudate (if present)
  - Distribution
  - Duration
  - Extent

So what’s new?? More emphasis on ETIOLOGY
Multiple 6 week old pigs on a single farm have developed skin lesions. The farmer wants to know what is causing the lesions.
Scattered randomly over the body are numerous, multifocal to coalescing skin lesions, the majority of which range in size from 0.3 cm to 1 cm in diameter.
Affected areas are round to irregular, raised, and often have a central region of depression, a surrounding rim of red discolouration, and are covered by a crust.
Morphologic Diagnosis

Example:

Dermatitis, hyperplastic and ulcerative, multifocal to coalescing, chronic, moderate, with papules, pustules, and crusting.
Etiology

For many cases you begin with a differential list which you narrow down to a diagnosis with additional testing: histology, bacteriology, virology, etc.

Example

Differential Diagnoses
- Swinepox
- Vesicular diseases
- Allergic skin reactions
- Bacterial skin disease
- Sunburn
- Ringworm

Tissues can be sent for histology and virological testing to confirm.
Etiology

Swinepox – caused by Swinepox virus (*Suipoxvirus*)

**Example:**

Typical progression of pox lesions:

1. Macule
2. Papule
3. Vesicle
4. Umbilicated pustule
5. Crust
Macule = circumscribed area of discolouration ≤ 1 cm

If > 1 cm = patch

Basic skin lesions: multiple skin samples from different species
Basic skin lesions: multiple skin samples from different species

**Cyst** = an epithelial lined cavity containing fluid or solid material
Tumour = a mass (neoplasia implied) that may involve any structure of the skin or subcutis (or any other organ)
Callus = A thickened, rough, hyperkeratotic, alopecic, often lichenified plaque that develops on the skin.
Lichenification = a thickening and hardening of the skin with exaggeration of the superficial markings.
Alopecia = loss of hair

Alternatively, this could represent hypotrichosis – failure to develop hair (history is important!)
Basic skin lesions: multiple skin samples from different species

**Crust** = an accumulation of dried exudate, blood / serum, scale or medications adherent to the skin surface
Hypermelanosis = Black pigmentation of the skin
Erythema = Reddening of the skin

Basic skin lesions: multiple skin samples from different species
Abscess = A well demarcated fluctuant lesion resulting from dermal / subcutaneous accumulation of pus
Ulcer = A break in the epidermis with exposure of the underlying dermis.

Differentiate from Erosion: a shallow epidermal defect that doesn’t penetrate the basement membrane.
Case 1 9 month old lamb. Incidental finding.

Describe the changes and make a morphologic diagnosis.
Case 1 9 month old lamb. Incidental finding.

**DESCRIPTION**
The mouth has multifocal, firm, raised nodules, up to 4mm in diameter, covered by a dry scaly exudate.

**Morphologic diagnosis**
Cheilitis, proliferative, multifocal

**Disease:** Contagious exanthema (Orf)

**Etiology:** Parapoxvirus

**Zoonosis**
CASE 2
Free range hen with history of scaling, crusty slin and loss of feathers. These birds are interacting with pigeons, gulls and crows.

Describe the changes and make a morphologic diagnosis.
CASE 2

Free range hen with history of scaling, crusty slin and loss of feathers. These birds are interacting with pigeons, gulls and crows.

DESCRIPTION

The skin of both feet was markedly thickened and covered with thick friable crusts (hyperkeratosis).

MORPHOLOGIC DIAGNOSIS

Dermatitis, proliferative (hyperplastic), locally extensive, chronic with marked hyperkeratosis.
Name of the disease: **Scaly leg**
Etiology: **Cnemidocoptes jamaicensis**
CASE 2

Differential diagnosis:

Bumble foot (*Staphilococcus aureus*)
History: A 6 month old mixed breed dog developed ocular discharge, vomiting, diarrhea one week ago. It then developed muscle twitching and lesions on all of the foot pads.

Describe the changes and make a morphologic diagnosis.
There is thickening of the digital pads of the paw. The affected pads are covered by a brown crust.

**Morphologic Diagnosis:**

Pododermatitis, proliferative and hyperkeratotic, diffuse, moderate, chronic

or

Hyperkeratosis of the digital pads
Differential Diagnoses

- Canine Distemper
- Nasodigital hyperkeratosis
- Familial pawpad hyperkeratosis
- +/- Pemphigus foliaceus

Given the history with ocular discharge, digestive signs and nervous signs, Canine distemper is considered most likely. Tissues can be sent for histology and virological testing to confirm.

<table>
<thead>
<tr>
<th>Morphologic Diagnosis</th>
<th>Pododermatitis, proliferative and hyperkeratotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease Name</td>
<td>Hard pad disease (canine distemper)</td>
</tr>
<tr>
<td>Etiologic Diagnosis</td>
<td>Viral pododermatitis (or distemper pododermatitis)</td>
</tr>
<tr>
<td>Etiology</td>
<td>Canine distemper virus (Morbilivirus)</td>
</tr>
</tbody>
</table>
Case 4

Skin (ears) from a young female moose. Two moose were found dead in Kouchibouguac National Park (NB). One of the animals had a high number of external parasites and a poor haircoat. The head was submitted for examination.

Photo by Rick Price: http://www.treknature.com/gallery/North_America/Canada/photo148971.htm
Description:
Locally extensive areas of alopecia and thickened skin are present on the head and ears. These areas are partially covered by a tan-brown crust with numerous ticks present in the affected region.

Morphologic Diagnosis:
Dermatitis, locally extensive, chronic, severe, with alopecia and crusting.
Etiology:

Tick infestation: *Dermacentor albipictus* (the winter tick). Affected animals are often called ghost moose.
Case 5

2 month old calf with presented with easy loss of epidermis when a little pressure was exerted on the intact skin. The animal was humanely euthanized.
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2 month old calf with presented with easy loos of epidermis when a little pressure was exerted on the intact skin. The animal was humanely euthanized.

DESCRIPTION

- There are multifocal to coalescing erosions and crusts on the skin.
- There are ulcers in the oral cavity.
- There is exungulation of all hooves.

EPIDERMOLYSIS BULLOSA
History: A pig with multiple raised black masses in the skin was submitted for postmortem.
History: A pig with multiple masses in the skin was submitted for postmortem.
Case 6: Skin from a pig

**Description:**
 Several black masses measuring up to 10 – 15 cm are present in the skin. The masses are firm, black, nodular to irregular, and occasionally ulcerated. The cut surface is solid and relatively homogeneous and appear to invade the dermis.

**Morphologic Diagnosis:**
 Skin, melanoma, multifocal
Case 6  Skin from a pig

Etiology

• Like most tumours – etiology is unknown, but melanocytic tumours in pigs are often seen as an inherited congenital lesion.
• Breeds predisposed: Sinclair (Hormel), Duroc and crosses.
Case 7  Skin from an 8 month old Holstein heifer

History:
3 months ago: Animal purchased with scabby lesions over the face and back. The owner thought it had mange and treated with ivermectin (3 times) Now lesions are much more severe and the animal is pruritic. The animal was donated to AVC for teaching.

Describe the changes and make a morphologic diagnosis

From Cornell Veterinary Medicine: Necropsy show and tell: veterinary pathology images
Description:
Several round to irregular, often coalescing, raised, thick, yellow-tan crusts are present on the skin. The skin is thickened.

Morphologic Diagnosis:
Dermatitis, multifocal to coalescing (or locally extensive), chronic, severe, with marked crusting (hyperkeratosis).
**Differential Diagnoses**

- Dermatophilosis
- Mange (Sarcoptes)
- Ringworm (Dermatophytosis)

"Rain scald"

**Can do skin scrapings, histopathology and bacterial culture to confirm**

<table>
<thead>
<tr>
<th>Morphologic Diagnosis</th>
<th>Dermatitis with extensive crusting</th>
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</thead>
<tbody>
<tr>
<td>Disease Name</td>
<td>Dermatophilosis (Rain scald)</td>
</tr>
<tr>
<td>Etiologic Diagnosis</td>
<td>Bacterial dermatitis</td>
</tr>
<tr>
<td>Etiology</td>
<td><em>Dermatophilus conglobensis</em></td>
</tr>
</tbody>
</table>
Predisposing factors:
Prolonged wetting by rain, high humidity, high temperature + ectoparasites → reduce or permeate natural barriers of the integument → development, prevalence, seasonal incidence, and transmission of *Dermatophilus congolensis* (bact)

The organism can exist silent within the epidermis until infection is exacerbated by climatic conditions.

Lesions in 3 stages:
1) hairs matted together as paint-brush lesions,
2) crust or scab formation as the initial lesions coalesce
3) accumulations of cutaneous keratinized material forming wart-like lesions, raised and 0.5-2 cm in diameter.

* Distributed over the head, dorsal surfaces of the neck and body, and upper lateral surfaces of the neck and chest.
3 month old Stb colt that got the hind leg stuck in an electric fence. Gentamicin and surgery treatment but the wound dehisced, with purulent discharge.
Case 8

3 month old Stb colt that got the hind leg stuck in an electric fence. Gentamicin and surgery treatment but the wound dehisced, with purulent discharge.

**DESCRIPTION**

There is exposure of the 3MT bone that extends along most of its length. The circumference of the exposed bone is lined by thin necrotic skin in which are inserted several drains. The distal aspect is composed of a thick necrotic skin, muscle and tendon. The hoof is separated from the leg at the coronary band.

**Morphologic diagnosis**

Hindleg: gangrenous necrosis, locally extensive, severe, subacute with separation of the hoof at the coronary band
Minimal disease swine herd. Gilt is penned with 5 other gilts.

Describe the changes and make a morphologic diagnosis

Minimal disease swine herd. Gilt is penned with 5 other gilts.

There is generalized multifocal to coalescing dark red discoloration of the skin with more coalescing dark red macular lesions on the caudal aspect of the pinna and limbs. Similar but less severe lesions present on the forelimbs. In the severely affected areas there is thickening of the skin with hemorrhage and edema.

Severe hemorrhagic dermatitis with vasculitis.
OR Severe multifocal to coalescing dermal hemorrhages.

Differential diagnosis:
* Porcine dermatitis and nephropathy syndrome PCV-2
* PRRS virus
* Classical swine fever
* African swine fever
* Erysipelotryx rusopathiae
* Sepsis (E. coli)

QUESTIONS?