

Correlation  
Histopathology and Clinical Presentations:

I. Histopathologic Descriptions

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Goal

1. Match histopathologic reports 1 to 10 with histologic pictures A to K
2. Formulate a morphologic diagnosis
3. List possible clinical lesions associated with this histologic changes

**CASE 1: “Nantucket”, 10 year old Westfalian gelding**  
Histopathology report:

Examined are sections of haired skin in which the epidermis is diffusely hyperplastic (acanthotic) and covered by a thick crust. The superficial, mid and deep dermal vessels are prominent and lined by plump endothelial cells. Many superficial dermal vessels contain homogeneous eosinophilic material and have indistinct brightly eosinophilic walls. Other vessels have pale vascular walls (hyalinization). Fragments of pyknotic nuclei are scattered within the perivascular space intermixed with few lymphocytes, plasma cells, neutrophils and red blood cells (micro-hemorrhage). The large crust is composed of brightly eosinophilic collagen embedded in degenerate inflammatory cells serum lakes, hemorrhage coagulative necrosis of epidermis. At the surface of the crust are numerous aggregates of bacterial colonies.

**CASE 2: “Memphis Belle”, 8 year-old female spayed smooth coated collie**  
Histopathology report:

Examined are four bisected punch biopsies of haired skin that extend to and include the subcutaneous adipose tissue. The epidermis is multifocally elevated in a plaque-like fashion. In the elevated areas, there is marked parakeratosis, which extends into the follicles. Multiple small, rather well defined crusts are embedded within this thick keratin layer. Some colonies of bacterial cocci are noted in the superficial crusts. Multifocally, small pustules are present within the hyperplastic epidermis. The superficial dermis is expanded by a continuous band of plasma cells with fewer lymphocytes. Large numbers of individual neutrophils transmigrate though the hyperplastic epidermis.

**CASE 3: “Romy”, 10 year-old Thoroughbred gelding**  
Histopathology report:

**A1:** Three replicate sections of a bisected punch biopsy are examined in which the surface is diffusely covered by a sero-cellular crust overlying intact epidermis. The dermis is infiltrated by a pleocellular inflammatory infiltrate. The crust is composed of necrotic epidermis, inflammatory cells and collagen bundles. The dermal infiltrate is composed of histiocytes, fewer lymphocytes, plasma cells, rare granulocytes. Multifocally, there are multinucleate giant cells. Multifocal neutrophilic exocytosis is present.

**B1:** Two replicate sections of a bisected punch biopsy of haired skin are examined in which there are similar dermal lesions as described in A1. The inflammatory lesions are more severe, but there are no sero-cellular crusts.

**CASE 4: “Aiden” male castrated, 2 year-old Shepherd-mix**  
Histologic description:

Examined are two bisected punch biopsies of haired skin, one of which includes a sinus hair (vibrissa). The dermis contains a superficial diffuse infiltrate composed of numerous histiocytes, plasma cells, lymphocytes and rare clusters of degenerate neutrophils. Some histiocytes contain melanin pigment. The epidermis is thickened to 9 layers and rare individual apoptotic keratinocytes are observed. There are multifocal intracorneal clefts that are filled with lakes of homogeneous eosinophilic material (serum). Multifocally, inflammatory cells are migrating into the epidermis resulting in obscuring of the dermo-epidermal junction.

**CASE 5: “Molly” female spayed, 10 year-old Labrador retriever**  
Histopathology report:

**A:** Examined are duplicate sections of a bisected punch biopsy in which dermis and subcutis are largely effaced by nodular, coalescing cellular infiltrate composed of large round cells with round to oval or indented vesicular nuclei (histiocytes) and numerous smaller round cells with little cytoplasm (lymphocytes) and intermediate round cells. The latter population has round nuclei with stippled chromatin and a small to intermediate amount of pale cytoplasm. Anisocytosis and anisokaryosis of this latter cell population is moderate. Twenty mitotic figures are observed in ten 400x fields. Multifocally, there are areas of pale indistinct wispy collagen separating preexisting dermal collagen bundles and the nodular infiltrate is tightly surrounding dermal vessels.

**B:** Examined are three bisected punch biopsies with lesions similar to A. In addition, the epidermis is regionally ulcerated and the associated superficial dermis is diffusely necrotic, with large numbers of neutrophils and abundant colonies of basophilic cocci.

**CASE 6: adult female Ring-tailed Lemur**  
Histopathology report:

**A:** Examined are multiple skin samples from “affected skin”, characterized by small hair follicles. Most follicles have an irregular outer root sheath and either lack hair bulbs (interpreted as telogen, resting phase) or have small remnants of hair bulbs. Many of these hair follicles lack hair shafts. There is no evidence of inflammation. The overlying epidermis is moderately acanthotic and there is compact to lamellar hyperkeratosis.

**B:** Examined are two sections of “non-affected” skin. The samples are within normal limits with many anagen hair follicles.

**CASE 7: "Salsa", 4 year-old, male castrated, DMH, orange tabby cat**  
Histopathology report:

**A. Haired skin:** Multiple sections of markedly acanthotic and hyperkeratotic haired skin are examined in which there is a similar process. There are multiple large subcorneal or intraepidermal accumulations of mostly viable neutrophils that are often associated with hair follicles extending into the infundibular region. The superficial dermis is expanded by edema, and expanded by a moderate to dense inflammatory cell infiltrate that is perivascular to diffuse. The inflammatory cell infiltrate consists of numerous neutrophils admixed with moderate numbers of mast cells, plasma cells, lymphocytes, and occasional Russel bodies. A few nodular foci of histiocytes and neutrophils are surrounding remnants of ruptured hair follicles, such as keratin squames and small clusters of disrupted glands. There is moderate to marked spongiosis of the epidermis in several areas. Within some of these intraepidermal pustules, there are individualized, rounded, brightly eosinophilic keratinocytes admixed with the inflammatory cells. In some sections there are copious amounts of parakeratotic keratosis, admixed with neutrophils, serum and granular, basophilic material forming a thick crust. There are occasional rounded, bright pink cells (keratinocytes) within the crusts. In less affected areas the subcorneal pustules coalesce to form a smaller crust.

**B. Crusts:** These two slides consist of multiple sections of thick crusts that are composed of serum, keratin layers, degenerated neutrophils and occasional rafts of epithelial cells.

**CASES 8: "Micky", 5 year-old, male neutered DSH cat**  
Histopathology report:

Examined is a bisected punch biopsy of skin in which there is marked atrophy of the hair follicles, epidermal hyperplasia and a mild superficial perivascular dermal infiltrate. The hyperplastic epidermis and remaining superficial portion of the remaining follicular epithelia lack features of differentiation and are characterized by irregularly arranged keratinocytes with moderate to marked anisocytosis and anisokaryosis. Occasional karyomegaly is observed and numerous keratinocytes contain two to three nucleoli. There is mild multifocal micro-hemorrhage and thin wavy collagen bundles are seen within the superficial dermis. The mild perivascular dermal infiltrate is composed of mast cells and lymphocytes.

**CASE 9: “Coco”, 5 year-old, mixed breed dog**Histopathology report:

Three bisected punch biopsies of haired skin are examined in which there is a severe, inflammatory cellular infiltrate within the dermis, multifocal to coalescing transepidermal necrosis with ulceration. The inflammatory infiltrate is predominated by eosinophils, which infiltrate and replace the follicular epithelia resulting in prominent eosinophilic cuffs surrounding free hair shafts (eosinophilic furunculosis). The inflammatory infiltrate coalesces to a diffuse dermal infiltrate in some areas. Admixed with the eosinophils are fewer neutrophils, macrophages, mast cells and occasional lymphocytes. The epidermis is multifocally eroded or ulcerated and there is marked protein rich dermal edema. The endothelial cells lining the small dermal vessels are plump and there are numerous eosinophils within the vascular Lumina. Inflammatory cells multifocally infiltrate, disrupt or efface hair follicles and adnexal structures in the most severely affected sections and extend into and replace regions of the epidermis. The infiltrate is composed of large numbers of neutrophils and eosinophils with fewer lymphocytes, plasma cells, macrophages, reactive fibroblasts, and occasional mast cells. Occasionally these cells transmigrate vessels walls, which are lined by plump reactive endothelium throughout the sections. Eroded and ulcerated surfaces are replaced by lakes of serum, blood, and non-degenerate neutrophils, and in these areas, there is severe edema in the dermis with marked acanthoses of the remaining epidermis and follicular epithelium.

**CASE 10: “Diego”, 4 year-old, male Chihuahua-terrier mix**Histopathology report:

**A.** Two bisected sections of haired skin are examined.

One section is characterized by marked deposition of very fine fibrillar, to more homogeneous eosinophilic and partially basophilic material between the preexisting collagen bundles (interpreted as ischemic change of collagen). The follicles are atrophic and retracted. The epidermis is slightly acanthotic and occasional apoptotic basal cells can be seen. Small dermal vessels often have indistinct swollen vascular walls and endothelial cells are absent.

**B.** Examined is a section of skin overlying a layer of cartilage. The latter is focally necrotic. There is a fine fibrillar matrix replacing normal superficial collagen. A mild mononuclear infiltrate is noted including some histiocytes that contain brown pigment (interpreted as pigmentary incontinence). Small linear epithelial structures represent remnants of atrophied hair follicles.