The Armed Forces Institute of Pathology
Department of Veterinary Pathology
WEDNESDAY SLIDE CONFERENCE
2002-2003

CONFERENCE 19
26 February 2003

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CASE I – H01-4829 (AFIP 2840021)

Signalment: 6-year-old, castrated male, domestic shorthair cat (*Felis catus*)

History: Cutaneous mass (5 x 4 x 4 cm) from the abdomen. Specimen was analysed by routine biopsy services.

Gross Pathology: Poorly demarcated, unencapsulated white to brownish, edematous mass intermixed with subcutaneous fat tissue

Laboratory Results: N/A

Contributor's Morphologic Diagnosis: Feline abdominal angiosarcoma

Contributor's Comment: Feline abdominal angiosarcoma is a malignant infiltrative vascular neoplasm within the dermis and subcutis forming clefts and channels but also showing papilliferous and solid growth patterns. The stroma contains lymphocytes, plasma cells, some neutrophils and hemosiderophages. Although it is still controversial whether the endothelial cell proliferation in this syndrome is of blood vessel or lymphatic vessel origin, the diagnosis of lymphangiosarcoma is favored by some others. This is based on light-microscopic evidence of the close association of neoplastic cells with collagen bundles. In addition, ultrastructurally, a continuous basal lamina is lacking. The extensive infiltrative growth of this neoplasm leads to frequent recurrences. Metastasis is rare.

Using an avidin-biotin complex immunoperoxidase staining with anti-human factor VIII antibodies (Dako), neoplastic cells were found to be positive. Still, according to the publication by Hinrichs et al., factor VIII expression cannot be used as a differential marker for vascular tumours in the cat.

AFIP Diagnosis: Haired skin: Feline ventral abdominal angiosarcoma, Domestic Shorthair, feline.

Conference Comment: The diagnosis of feline ventral abdominal angiosarcoma is based on anatomical location, clinical history, gross appearance and histological features. This neoplasm is rare and occurs in adult, aged cats in the area of the caudoventral abdominal wall and mammary glands. Grossly, the neoplasm has a red-black, plaque-like appearance with serosanguineous exudation. The texture varies from firm to soft and typically is not a distinct mass lesion. The differential diagnosis includes hemangiosarcoma and lymphangiosarcoma; however, current nomenclature favors angiosarcoma to avoid the controversy of blood or lymphatic vessel origin. This neoplasm can resemble the rare canine lymphangiosarcoma, which is a frequently solitary, poorly circumscribed, fluctuant, edematous and exudative neoplasm of the limbs and ventral abdomen.

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CASE II - 2513-02 (AFIP 2839301)

Signalment: 5-year-old, male, castrated, canine, Chihuahua

History: One by three cm lesion on the dorso-lateral neck

Gross Pathology: None

Laboratory Results: None

Contributor's Morphologic Diagnosis: Post-rabies vaccination alopecia with injection site granuloma and panniculitis

Contributor's Comment: The hair follicles are markedly atretic and their lower portions are replaced by an eosinophilic, hyaline stroma. The deeper dermis also has a cleft or seroma pocket that is partially lined by a thin layer of foamy macrophages and multinucleated giant cells with more peripheral lymphoid nodules with many scattered dermal macrophages, lymphocytes and plasma cells. Scattered melanin-laden macrophages (positive with Fontana-Masson melanin stain and negative for hemosiderin with a Prussian blue stain) are in the hyalinized lengths of the hair follicles with a few beneath the epidermal basement membrane (pigmentary incontinence).

This is post-rabies vaccination alopecia with an underlying injection site granuloma. Post-rabies vaccination alopecia is most commonly seen in toy or small breeds, especially Poodles, but Chihuahua cases have been reported. The lesion usually develops three to six months after vaccination.

Other reports describe mild to severe lymphocytic inflammation with macrophages in the superficial or deep dermis or scattered around hair follicle remnants. The dermis may have smudging of the collagen, especially around the hair follicles. Rabies vaccine antigen has been found in the hair follicle epithelium and in the walls of vessels in the area. One report of focal alopecia developing in all twelve of twelve inbred miniature Poodles injected with a killed rabies vaccine two months earlier suggest that there may be a familial predisposition to this apparently idiosyncratic, hypersensitivity reaction to the antigen.

AFIP Diagnosis: Haired skin and subcutis: Panniculitis, lymphofollicular and granulomatous, focally extensive, moderate, with pseudocyst formation, rare intrahistiocytic amphophilic foreign material, marked adnexal atrophy, mild epidermal hyperplasia, degeneration and orthokeratotic hyperkeratosis, Chihuahua, canine.

Conference Comment: The presumed pathogenesis of post-rabies vaccination alopecia begins with focal complement-mediated cutaneous vasculitis of deep dermal and subcutaneous arterioles that causes an ischemic dermatopathy with disruption of the normal hair growth cycle (anagen, catagen, telogen). Follicular atrophy and alopecia are a result. However, some uncertainty in the pathogenesis derives from the inconsistent presence of histopathologically identifiable vasculitis. An attempt should also be made to locate foreign material that is characteristic of vaccine within lesions that are presumed to be vaccine-associated. The gross appearance is a solitary, variably sized, alopecic macule or plaque in a typical vaccination site such as the caudal or lateral thighs or between the scapulae. Lesions may be hyperpigmented, and are less often scaly or erythematous. Focal post-vaccinal alopecia is occasionally associated with antigens other than rabies vaccine. Rarely, additional multifocal ischemic lesions develop one to five months subsequent to the injection site lesion.

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CASE III – 2679A (AFIP 2841686)

Signalment: 5-year-old female, intact, domestic, *Oryctolagus cunciculus,* rabbit

History: N/A

Gross Pathology: A moderately hyperkeratotic, acanthotic, and well-demarcated mass from the left hip.

Laboratory Results: None

Contributor's Morphologic Diagnosis: Rabbit, skin, Basal Cell Carcinoma.

Contributor's Comment: A section of moderately hyperkeratotic, moderately acanthotic, focally protruding skin from the left hip was examined. The section consisted of a large, well-demarcated, highly cellular mass. The mass consists of ribbons and cords of neoplastic basal cells. Neoplastic cells are relatively uniform and have distinct cytoplasmic borders. Nuclei are small but distinct. Mitotic figures are occasionally seen. There is a moderate to marked amount of dense connective tissue stroma. The mass was surrounded by compressed stroma, which consisted of a focal inflammatory infiltrate containing plasma cells and lymphocytes. A fibrin and heterophil exudate was present on the superficial ulceration.

Basal cell carcinoma is one of the most common types of cancer in humans. Basal cell tumors arise from the germinal layer or stratum germinativum. Unlike most carcinomas, basal cell carcinomas rarely metastasize. In most mammals, the head, neck, shoulder and hip regions are the most common sites of localization. The tumors frequently do not occur after surgical excision. Transgenic mice overexpressing

smoothened or Sonic hedgehogs spontaneously produce skin lesions resembling human basal cell carcinomas.

AFIP Diagnosis: Haired skin: Basal cell tumor (trichoblastoma), breed not specified, rabbit (*Oryctolagus cuniculus*), lagomorph.

Conference Comment: Basal cell tumor is a rare benign neoplasm of adult rabbits. Conference participants favored benignancy over malignancy in this case because of the uniform population of well-differentiated basal cells; lack of invasion; low mitotic index; and well circumscribed, expansile histologic appearance. Canine, equine and ovine basal cell tumor, and spindle cell subtype of feline basal cell tumor have recently been reclassified as trichoblastoma. The World Health Organization (WHO) restricts the diagnostic usage of basal cell tumor to describe a benign dermal mass of neoplastic cells that recapitulate the basal cell layer of the normal epidermis. The WHO defines trichoblastoma as a benign neoplasm that originates from or shows differentiation to the primitive hair germ of the developing follicle.

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CASE IV - P02-041 (AFIP 2841034)

Signalment: A female 3-months-old growing pig.

History: The owner of a female 3-months-old growing pig from a farrow to finish pig farm complained of skin lesions on the pig that were especially more prominent on the

belly and thigh. Other clinical signs included anorexia, slight fever and reluctance to move. The morbidity was high (8/8) but none of the sick pigs was found dead. The pig was euthanized for pathological examination.

Gross Pathology: Nutritional state of this euthanized pig was fair. Systemic vesicular, papular or nodular dermatopathy was easily noticed. Papular lesions occurred anywhere of the skin, but were more obviously found on the belly and thigh. There were some tiny gray/white scales scattered over the skin of the dorsal midline. Papules or nodules were solitary and from 1 cm to 5 cm in diameter. Some papular lesions fused together, and their size varied from 3 cm to 15 cm in diameter. Central parts of most papules or vesicles were ulcerated and were accompanied by scar formation. Umbilicated papular lesions could also be observed. A small amount of fibrinous exudate was present in the peritoneal cavity; other internal organs were grossly normal.

Laboratory Results: Poxvirus was identified in a homogenate of biopsied skin by electron microscope.

Contributor's Morphologic Diagnosis: Haired skin: dermatitis, necrotizing, subacute, focally extensive, moderate to severe, with acanthosis, perivasculitis and panniculitis, and epithelial ballooning degeneration and eosinophilic intracytoplasmic inclusion bodies, skin, porcine, etiology consistent with a poxvirus.

Contributor's Comment: The etiology of swinepox is swinepox virus, the prototype virus of Suipoxvirus of Poxviridae. Swinepox virus is a DNA virus that has a brick-shape virion, about 300x240x100 nm in size; there is irregular arrangement of tubules on the outer membrane; these are complex structures with core, lateral bodies, outer membrane, and are sometimes enveloped. There are transcriptase, poly(A) polymerase, capping enzyme, and methylating enzymes in the virion. Poxvirus has cytoplasmic replication, and enveloped particles are released by exocytosis; nonenveloped particles are released by cell lysis. Poxviruses are resistant to ambient temperatures and may survive many years in the dried scabs.

Transmission of swinepox virus from pig to pig is by the bite and sting of the pig louse (*Hematopinus suis*) or mosquito. Swinepox is usually a mild infection, with lesions restricted to the skin. Virus cannot replicate in the louse.

Papular or nodular lesions may occur anywhere on the skin but are most obvious on the belly. After infection, the pig may show transient slight fever before development of papules, which within 1 to 2 days, papules have become vesicles and then umbilicated pustules progressively. Other clinical signs include anorexia, decreased growth rate and daily weight gain. As disease progresses, the pocks crust over and scab by 7 days. Healing is usually complete by 3 weeks. There were not any other prominent clinical signs in addition to papular skin lesions.

Differential diagnosis of swinepox infection includes foot and mouth disease, vesicular stomatitis, and vesicular exanthema of swine. Any other diseases that are accompanied by pustular or vesicular presentation should also be considered clinically. No commercial vaccine is available clinically. Effective preventive measures for

poxvirus infection include good sanitization and elimination of blood-suckling arthropods such as the pig louse and mosquito to block mechanical transmission.

Electron microscopic examination is an ideal option for diagnosis of swinepox virus infections because of the large size and special envelope structure of virion.

AFIP Diagnosis: Haired skin and subcutis: Dermatitis and panniculitis, ulcerative and proliferative, chronic-active, focally extensive, moderate, with ballooning degeneration, epidermal eosinophilic intracytoplasmic inclusion bodies, etiology consistent with suipoxvirus, breed not specified, pig, porcine.

Conference Comment: This is a classic example of swinepox, a unique disease that affects only pigs. Swinepox virus is the single member of the genus Suipoxvirus in the family Poxviridae. The pathognomonic histologic appearance of prominent eosinophilic intracytoplasmic inclusion bodies, central nuclear clearing and margination of chromatin, ballooning degeneration, and epithelial proliferation aids in differentiating swinepox from other vesicular or pustular diseases. In addition to mechanical transmission by the pig louse (*Haematopinus suis*) and other arthropod vectors, there is occasional horizontal transmission between pigs through the contact of abraded skin with nasal and oral exudates or skin lesions. There are also rare reports of congenital infection, suggesting *in utero* infection. Disease is more severe in piglets and more prominent on hairless areas such as the ventral abdomen. Electron microscopy and immunofluorescence may be used to confirm swinepox infection.

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*Sponsored by the American Veterinary Medical Association, the American College of Veterinary Pathologists and the C. L. Davis Foundation.