DISEASES OF BLOOD VESSELS

Degenerative Diseases

VPM 222

Cardiovascular Pathology
Diseases in Animals

- Dog
  - **Atherosclerosis**
    - Lipid accumulation occurs in the intima or media of muscular arteries
    - Secondary to hypercholesterolemia usually due to
      - Hypothyroidism
      - Diabetes mellitus
Diseases in Animals

- **Medial sclerosis**
  - Occurs in association with endocardiiosis

- **Amyloidosis**

- Little or no evidence that either process have any clinical or pathologic significance
Diseases in Animals

Pig

- **Atherosclerosis**
  - Pattern mimics that of human beings
  - Proposed as best species for experimental study
  - Little or no evidence that these lesions have any clinical or pathologic significance
Diseases in Animals

Cow

• Intimal mineralization
  – Johne's disease
    • Aortic arch
  – Vitamin D toxicoses
  – Vitamin D analog poisoning
Diseases in Animals

Cat

• Medial hypertrophy
  – Pulmonary arteries
  – Associated with reaction to parasites
    • Paragonimus
    • Toxocara
  – Observed in SPF cats
  – Clinical Disease?
Diseases in Animals

Other Animals

• Atherosclerosis
Inflammatory Diseases

Definitions:

- **Periarteritis**
  - Inflammation of the adventitia
- **Polyarteritis** –
  - Inflammation of many arteries
- **Phlebitis**
  - Inflammation of a vein
- **Vasculitis** –
  - Inflammation of vessels
    - arteries and veins
- **Endoarteritis**
  - Inflammation of intima
Inflammatory Vascular Disease
Viral Causes

Equine Viral Arteritis
- Polyarteritis
  - media and adventitia
- Widespread petechiae
- Generalized Edema

• Malignant Catarrhal Fever (MCF)
  - Cattle
  - Polyarteritis and periarteritis
Inflammatory Vascular Disease

Viral Causes

• Equine Infectious Anemia
  – Polyarteritis and periarteritis

• Bluetongue
  – Sheep

• Feline Infectious Peritonitis
  – Pyogranulomatous vasculitis

• Aleutian disease
  – Mink

• Hog Cholera
  – Pigs
Inflammatory Vascular Disease

Bacterial Causes - Vasculiti

- *Salmonella* sp
- *Histophilus somni*
  - (TEM)
- *E coli*
- *Erysipelothrix rhusiopathiae*
Inflammatory Vascular Disease
Parasitic Causes

- *Strongylus vulgaris* in the horse
  - Fourth stage larval forms
  - Live in intestinal arteries
    - Causes intense focal inflammatory reaction in the walls of the larger arteries
    - Aneurysmal dilation
    - Thrombosis
    - Infarction distal to involved site
  - Thromboembolic colic of horses
Inflammatory Vascular Disease

Parasitic Causes

- *Dirofilaria immitis*
  - Adult worms live in pulmonary arteries of dogs
  - Microfilaria are found throughout circulation
    - Lesions
      - Villous pulmonary endoarteritis
      - Medial sclerosis and hypertrophy
      - Obstruction and narrowing of the lumen
        - May lead to right heart failure
Inflammatory Vascular Disease
Parasitic Causes

• Other Parasites
  – Angiostrongylus sp
  – *Spirocerca lupi*
  – Schistosomiasis
  – Elaeophoriasis
  – Onchocerciasis
Inflammatory Vascular Disease

Causes

• Fungi
  – Not common
  – Fungi disseminate via vasculature
    • Mycotic rumenitis
  – “Love vessels”
    • eg. guttural pouch mycosis
Inflammatory Vascular Disease

Causes

- **Immune Mediated Vascular Disease**
  - Systemic lupus erythematosus
  - Rheumatoid Arthritis
  - Polyarteritis nodosa
  - Staph hypersensitivity
Aneurysm
Miscellaneous Vascular Disease

• Dilatation and attenuation of a vessel wall, often only the stretched intima and adventitia remain due to rupture of the media

• Significance
  – May occur 2° to degenerative or inflammatory disease of a vessel
  – May Rupture

• Turkeys
  – Rupture distal aorta
Miscellaneous Vascular Disease

• **Varices**
  – Definition
    • Dilation and attenuation of vessel wall
    • eg. esophageal varices
      – May rupture producing fatal hemorrhagic shock

• **Telangiectasia**
  – Definition
    • marked dilation of an abnormal cluster of capillaries
    • Sometimes referred to as peliosis
    • Occurs in cow livers
Post Caval Thrombosis
Miscellaneous Vascular Disease

- Previously discussed
- Liver abscess –
  - dissects into post cava
- Emboli to lungs
Omphalophlebitis
Miscellaneous Vascular Disease

• Definition
  – Inflammation of the umbilical arteries and vein

• Lesions
  – Inflammation of the umbilical stump, umbilical arteries, hepatic abscesses, peritonitis, arthritis, and septicemia
Miscellaneous Vascular Disease

- **Portal Caval Shunts**
- **Post-stenotic dilation**
  - Phenomenon that regularly occurs when a large elastic artery becomes constricted in circumference. This is a sac like dilation that forms distal to the stenotic lesion.
- **Jet Lesions**
  - Secondary to excessive turbulence
Diseases in Animals

Pulmonary artery thrombosis

- Cushing's disease
- Protein losing glomerular disease
  - predisposes to thromboembolic disease
NEOPLASMS OF THE CARDIOVASCULAR SYSTEM

Primary

• Hemangiosarcoma
  – Synonyms
    • Hemangioendotheliosarcoma
    • Angioendotheliosarcoma
  – Location
    • Right atrium
      – German Shepherd
      – Often seen metastasis to lung
    • Spleen
    • Can occur anywhere

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NEOPLASMS OF THE CARDIOVASCULAR SYSTEM

Primary

• Hemangiosarcoma
NEOPLASMS OF THE CARDIOVASCULAR SYSTEM

Primary

- Hemangioma
  - Synonyms
    - Hemangioendothelioma
    - Angioendothelioma
  - Benign neoplasm of blood vessels
NEOPLASMS OF THE CARDIOVASCULAR SYSTEM

Primary

• Heart Base Tumor
  – Synonyms
    • Chemodectoma
    • Aortic body tumor
  – Incidence
    • Brachycephalic dog breeds
      – Boxer, Boston Terriers
    • Rare in cat
  – Arises from the chemoreceptor cells in the adventitia of the aorta, pulmonary artery or base of heart. Ectopic thyroid tumors are also reported at this site.
NEOPLASMS OF THE CARDIOVASCULAR SYSTEM

Primary

• Schwannoma
  – Synonym
    • Neurofibroma
  – Seen in cattle
  – Arises from nerves of epicardium, usually multicentric

• Others
  – Rhabdomyomas - rhabdomyosarcomas
  – myxoma/ myxosarcoma

http://w3.vet.cornell.edu/nst/nst.asp?Fun=Image&imgID=1588
NEOPLASMS OF THE CARDIOVASCULAR SYSTEM
Secondary

• **Lymphosarcoma**
  – Most frequently observed secondary tumor, especially in cattle and cats

• **Hemangiopericytoma**
  – Neoplasia of the pericytes