Disturbances of Circulation, Lab 2: Hemorrhage, thrombosis, and infarction

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History and Signalment:
- 6 week old MC pig
- Pig was fine in the morning & found dead in the afternoon

Necropsy
- The lungs were red, heavy and wet
- ~100 mls of clear fluid in the pericardial sac
- Patchy red areas evident on the epicardium & throughout the ventricular myocardium
Multifocal to coalescing hemorrhages (petechiae and paintbrush hemorrhages) are scattered over the epicardium.

Hemorrhage extends into the myocardium on section.
Case #1

- Multiple areas of congestion and hemorrhage are scattered throughout the myocardium.
Occasional small blood vessels contain fibrin deposits (thrombi) within the lumina.
Myocardiocytes have karyolytic / karyorrhectic nuclei and hypereosinophilic cytoplasm (coagulative necrosis).

The interstitium is mildly edematous.
Fibrin thrombi within capillaries are best shown with PAS staining.
Morphologic Diagnosis:
1) Myocardial congestion & hemorrhage, multifocal to coalescing, severe with microvascular thrombosis
2) Myocardial degeneration and necrosis, multifocal, acute, severe

Comment:
• These findings are characteristic of “Mulberry Heart Disease” (note, similar gross lesions can be seen with certain bacterial infections, esp *Strep. suis* infection)
• MHD is associated with a deficiency of Vit E and/or Selenium
• Other diseases in swine associated with deficiencies of Vit E & Selenium:
  • Nutritional myopathy (white muscle disease)
  • Hepatosis dietetica (see massive hepatic necrosis)
  • Nutritional fat necrosis (aka “steatitis” or “yellow fat disease”)
Signalment and History:
• 4-year-old Standardbred horse
• History of going around the race track twice and then losing control of its hind limbs
• PE: Hind limbs were cold to the touch & weak pulse felt in femoral artery

Necropsy
• A thrombus / thromboembolus was present at the bifurcation of the abdominal aorta (saddle thrombus)
Fig 21-24 (Dyce) Branches of the abdominal aorta, horse; 1, Aorta; 10, external iliac a.; 11, internal iliac a.;
Case #2

You can see why they are called saddle thrombi

Description?

- A solid soft red and tan mass is focally adhered to the intima of the caudal aorta and external/internal iliac arteries and occludes the lumen at this site
Case #2

The lumen of the large muscular artery is largely occluded by a thrombus.
• At one margin is a crescent shaped area of organization
• Fibrous connective tissue and deposits of yellow to brown-gold cytoplasmic pigment replace the thrombus in this region
• A new endothelial lined vascular channel has formed = recanalization
Case #2

- Yellow (hematoidin) and brown-gold (hemosiderin) cytoplasmic pigment is present within macrophages
- Represents phagocytosis and breakdown of RBCs
Morphologic Diagnosis:

- Arterial organizing thrombus, chronic, severe

Comment:

- The clinical signs can be accounted for by ischemia to the rear legs resulting from the thrombus
  - Cold temperature, lack of arterial pulse & muscle weakness
- There is not complete ischemia and infarction of the hindlimbs because of collateral circulation
  - That is why the loss of function only showing up during exercise
Case #2

Horse
• Unknown cause
  Strongyle-related (endothelial damage)
• Sepsis (hypercoagulability)

Dog
• Hypercoagulable states:
  Steroid treatment
  Cushing’s Disease
  Renal disease

Cat
• In association with cardiomyopathy
  Dilation of atrium (turbulence)
Signalment and History:
- Aged cat
- No history provided

Necropsy
- Widespread subcutaneous edema
- Ascites
- Hydrothorax
- Multiple, pale, wedge-shaped lesions in kidneys
Case #3

AVC #91
Case #3

Description?

- The kidney contains an irregular wedge-shaped pale eosinophilic area with a basophilic border.
- The apex is in the medulla and the base near the capsular surface.
Case #3

The inner pale area is composed of ghost-like remnants of the renal parenchyma (=coagulation necrosis of tubules and glomeruli)
The basophilic border is composed of a thick layer of inflammatory cells and cellular debris.
Comment:

- An interlobar artery was obstructed by a thrombus or thromboembolus resulting in ischemia to the renal parenchyma and subsequently coagulation necrosis.
Questions?