Caudal Vena Caval Syndrome
Definition

- Also called embolic/metastatic pneumonia, pulmonary thromboembolism, or caudal vena caval thrombosis.

- Syndrome associated with septic pulmonary thromboemboli resulting in multifocal abscesses in the lungs.
Pathogenesis

- The most frequent cause of vena caval thrombosis is a liver abscess:
  - Rumenitis secondary to lactic acidosis, occurs when diets high in fermentable carbohydrates are fed.
  - Bacteria, commonly *F.necrophorum* and *A.pyogenes*, penetrate the rumen epithelium and travel to the liver, resulting in abscesses.
  - The liver abscess may erode into the caudal vena cava causing acute death, or the abscess may infiltrate the wall of the vena cava and create a thrombus.
  - Septic emboli detach from the thrombus and travel to the lungs, causing abscesses.
- Septic thrombosis can also result from jugular phlebitis, mastitis, metritis, and foot rot.
- The thrombus can have different effects:
  - Small septic emboli can lodge in the arterioles and cause multifocal pulmonary abscessation, suppurative bronchopneumonia and pulmonary hypertension.
  - Large emboli can block pulmonary arteries and cause sudden death.
  - Abscesses can erode vessel walls resulting in hemorrhage and death.
Clinical Signs

- **Clinical signs of acute respiratory distress:**
  - Usually seen on necropsy.
  - Dyspnea
  - Hemoptysis, pale mucous membranes, epistaxis

- **Clinical signs of metastatic pneumonia:**
  - Loss of condition, inappetance and decreased rumen motility
  - *Respiratory signs* such as increased lung sounds, *wheezes*, dyspnea, cough
  - Tachypnea, epistaxis, *hemoptysis*
  - With or without the following: tachycardia, increased rectal temperature, *pale mucous membranes*, lack of ventroflexion on withers pinch, melena.

- Cor pulmonale in chronic cases leads to signs of right-sided heart failure, such as distended jugular veins and brisket edema.

- Once hemoptysis is present, the condition is invariably fatal.
Clinical Pathology

- **CBC and biochem:**
  - Hyperglobulinemia, anemia, chronic inflammation – neutrophilia with a left shift
  - Increased liver values (AST, GGT)

- **Other tests:**
  - Respiratory tract endoscopy and bronchiolar lavage
    - red blood cells, suppurative pneumonia
  - Glutaraldehyde clotting test
    - shorter clotting time due to high fibrinogen
  - Radiographs of lungs
    - irregular increases in density that indicate bronchopneumonia and abscesses
  - Ultrasonography of the caudal vena cava in the 11–12th intercostal space is the most indicative test.
    - caudal vena cava is oval/distended versus the normal triangular shape on cross-section.
Differential Diagnosis

- Pathognomonic signs: respiratory signs, anemia, wheezes, hemoptysis.

- Differentials for acute dyspnea:
  - anaphylaxis, acute bronchopneumonia, cud aspiration, etc.

- Differentials for chronic signs without hemoptysis:
  - right-sided heart failure, pericarditis, traumatic reticuloperitonitis, lymphosarcoma, endocarditis
  - verminous pneumonia, atypical pneumonia
Necropsy

- If die suddenly, often found in a pool of blood
- Thrombus in caudal vena cava
- Liver: abscesses, hepatomegaly
- Lungs: multiple abscesses, blood clots in airways, suppurative pneumonia
- Digestive: swallowed blood clots, melena
Acute respiratory distress:
- Usually found dead
- Fatal, no treatment

Chronic metastatic pneumonia:
- Grave prognosis, treat for salvage
- Antibiotics: extended therapy penicillin (weeks)
- Supportive: anti-inflammatory
Prevention

- Reduce incidence of lactic acidosis
  - adapt animals to high-carbohydrate diets
  - avoid large shifts in rumen pH
  - feed adequate effective fibre

- Prompt treatment of bacterial infections
  - antibiotic therapy when indicated for foot rot, mastitis, phlebitis, metritis.
References


