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Animal Sounds

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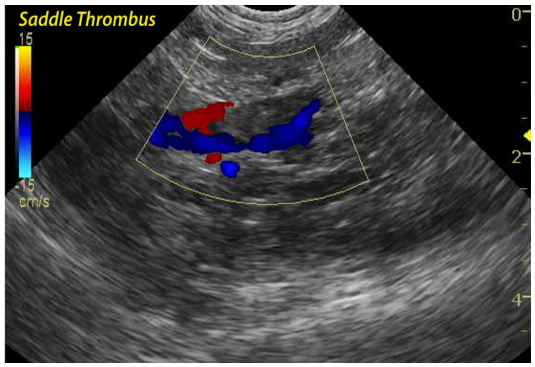
ARTERIAL THROMBOEMBOLISM (ATE) IN CATS – 3 PAGES



Clinical Presentation: ATE occurs when a thrombus develops within the Left Atrium and then moves to a distant site. Pulmonary neoplastic cells have been found in the thrombus, which suggests some of the emboli may originate in the lungs.

Clinical signs are primarily loss of limb function with the most common presentation being in the hind limbs (thrombus located at aortic trifurcation). Diagnosis is straightforward when cats present with the five classic signs of ATE: pulselessness, pain, pallor, paresis, and pokilothemia. But, under normal circumstances pulses may not be easy to palpate in an overweight cat, hypotension may result in poor peripheral pulses, and partially obstructed arteries may result in less obvious signs. The presence of a heart murmur is supportive but the lack of one does not rule out ATE. ATE is not likely to be the cause of clinical signs if the serum muscle enzymes are all within normal limits. Other presentations include loss of function in forelimb, hind limb or both, neurologic signs (from thromboembolism involving cerebral artery) and abdominal pain/vomiting (due to mesenteric arterial thrombus and intestinal necrosis) and acute renal failure (thrombus associated with renal arteries). According to Dr Alwood (ACVIM 2008) studies report a survival rate of approximately 40% with treatment (with approximately 35% being euthanized without attempted treatment). If cats survive the initial embolic event, re-embolization represents a common cause of future morbidity and mortality. Further research into thromboelastography (TEG) derived from human studies may allow for earlier detection of hypercoagulable states but is not widely available at the moment. For now clinical signs and traditional coagulation panel alterations are utilized to arrive at the presumptive diagnosis.

Other differentials for acute loss of limb function that should be considered are: spinal cord disorders (IVD, spinal neoplasia, trauma, embolism, FB), peripheral neuropathies associated with metabolic disorders, and intracranial abnormalities (embolism, trauma, shock, toxicity).

It is important to note that the overwhelming majority of cases have primary or secondary cardiac disease or neoplasia as underlying disorders. (Pulmonary carcinoma, hepatocellular carcinoma, vaccine associated sarcoma, squamous cell carcinoma) There are very few patients with no detectable underlying abnormalities not in these categories. Therefore routine patient work ups should include radiographs, serum chemistry, urinalysis, CBC, T4, EKG and echocardiogram. Concurrent underlying pathology affects long tern survival rates and therefore early identification of these disorders can help the clinician prognosticate for the client.

Survival Rates: **Body temperature** and presentation in **CHF** are two key indicators of both long term and short-term survivability. In general, less than 1/2 of cats will survive to discharge in spite of aggressive therapy. Smith et al. (ACVIM 2002) recently demonstrated a body temperature correlation to prognosis in cats. Patients demonstrated a 73% survival rate with a body temp 100°F, 50% at 99°F, and 25% at 97°F. The presence of CHF at presentation does not affect survival to discharge but makes a significant difference in long-term survival. The median survival time in a patient with CHF is 77 days. No cat with CHF was noted to live longer than 254 days in recent data comparisons

Complications: Permanent limb damage is the exception rather than the rule, but complications due to ischemia include: limb contracture, necrosis requiring either limb amputation or wound management.

Recurrence Information: Approximately 25% of patients will have recurrent ATE episodes. Mortality due to complications from underlying heart disease is 3X more likely to result in morbidity than is recurrent ATE.

Cautions and Considerations in Treatment of ATE: Only 50% of patients will present in CHF. Almost all will invariably have signs of dyspnea and tachypnea. Do not use respiratory rate or pattern to decide, as these are not reliable indicators. The use of **diuretics is detrimental to** all patients **not in CHF** because of volume depletion and its effects on systemic perfusion. Radiographs should be done prior to use of diuretics!! **The FAT CAT trial is underway blindly assessing aspirin (81 mg PO 72 hrs) versus Clopidrel (Plavix 18.75mg PO Q24hrs) regarding survival times and side effects but the study results will not be released for some time.** Therefore, personal preference and cost are primary selection criteria for these medications. Side effects at these doseages have been minimal and primarily that of vomiting and 1 case of pruritis.

Steps in Treatment of ATE:

1. **Body temperature**: Used to prognosticate:
2. **Oxygen**
3. **Analgesia**: The importance of adequate analgesia cannot be overstated. The negative effects of inadequate analgesia on recovery are well documented.
4. Radiographs: Cardiomegaly, CHF, pleural effusion, mediastinal or pulmonary neoplasia.
5. Serum Chemistries, CBC, and USG (prior to fluid administration or diuretics).
6. **UF (Unfractionated heparin)** 250-300U/KG s/q every 8 hours. Use IV if patient is presented in shock. LMW (low molecular weight) heparin offers no advantage to UF heparin in short-term management. Because of lack of predictive value in measuring aPTT and ACT it does not appear to be helpful to run these tests. Ideally the chromogenic activated factor X assay would be done (but is currently unavailable in most practices).
7. IV fluids for those patients not in congestive heart failure.
8. Treatment of hypothermia should not be a priority until shock and systemic perfusion are adequately addressed.
9. Follow up diagnostics: Echo, EKG, T4, additional testing for neoplasia if primary or secondary cardiac disease is not confirmed.

10. **ASA** @ 5m Q 72 hours once patient is eating. Discontinue heparin after patient is stable and receiving aspirin. Decrease dose gradually over a few day.
11. **Clopidogrel (Plavix)** (antiplatelet drug at 18.75 mg/cat from a 75 mg tab at 4$/tablet = 30$/ month) has recently been reported to be a favorable addition to increase collateral circulation and reduction of clinical signs when administered at the time of symptoms as compared to placebo in limited trials.

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