ANESTHETIZING DISEASED PATIENTS: URINARY; NEUROLOGICAL; TRAUMATIZED

Lyon Lee DVM PhD DACVA

Patients with Urinary Tract Diseases

General considerations

- Three main factors to consider in anesthetizing urinary tract diseased patient
  - Fluid, electrolyte and acid/base balance
  - The effect of drug on renal function
  - The effect of renal disease on drug metabolism
- Urinary tract rupture is present commonly in patients with car accidents
- Leakage of urine to the abdomen produces hyperkalemia, hyponatremia, hypochloremia and uremia.
- Hyperkalemia produces bradycardia, ventricular dysrhythmia, poor myocardial contractility and generalized weakness
- Excessive hyperkalemia predispose to severe cardiac dysrhythmia potentially leading to ventricular fibrillation, and therefore anesthesia should be postponed until normal restoration of serum potassium level
- Uremia produces CNS depression, alteration of thiopental sodium pharmacokinetic profile inducing overdose effect. In uremia, the percentage of unbound barbiturates doubles (from around 28 % to 56 %)

Anesthetic plan

- Check electrolytes and pH, and restore to the normal range
- Check PCV, TP, and hydration status, and restore to the normal range
- Catheterizing the urinary tract or peritoneum would help drain the urine and relieve some undesirable clinical signs
- Choose premedicants with minimal cardiovascular depression (e.g., neuroleptanagesic combination compri Tm [(C)-3niomova-2(T[124(a)4(ntom)-2(pr)3(i)-2(Tm [(C)-3)-2(ni))8/wt14(maintenance

- Keep warm and good analgesia
- Monitor electrolytes (with particular emphasis on K^+) and acid base status at least once intraoperatively as prognostic indicator regarding the surgery.
- Avoid NSAIDs
- Polyionic crystalloids at 10 ml/kg/hr is adequate for intraoperative fluid therapy, however if severely hypovolemic (especially if the problem is traumatic in origin), colloids are better alternative to restore circulatory fluid balance
- After correction, hypokalemia may develop, so serial check should be extended during the recovery period

Case example: ruptured bladder in foals

Problem	Significance or Potential Complication	Plan
CNS depression	Overdose, hypoventilation	Use less than the usual calculated dose rates, use controlled ventilation
Hypovolemia with hyponatremia, hypochloremia and hyperkalemia	Hypotension, dysrhythmia (second degree AV block or premature ventricular complexes)	Give normal saline before anesthesia
Metabolic acidosis	Decreased anesthetic requirement, decreased CV function	Treat moderate to severe acidosis with bicarbonate
Abdominal distension	Decreased cardiac output, hypoventilation	Decompress slowly, support CV function
Sepsis	Decreased anesthetic requirement	Use less than the usual calculated dose rates

Patients with Neurological Diseases

Patient with seizure disorders

- Medical management of epilepsy consists of a variety of drugs, most commonly phenobarbital
- Represent low risk for anesthesia, uncommon to see problems with seizure disorders during the perianesthetic period
- However, a few points to remember:
  - Maintain antiepileptic medications throughout the perianesthetic period
  - Avoid anesthetic agents that may exacerbate seizure disorders
    - Phenothiazines
    - Dissociatives

Patient with cranial mass; head trauma; CNS dysfunction

- Potentially difficult cases to manage
- Preoperative evaluation of CNS function important as may be presented in a semiconscious or unconscious state
- Intracranial space is fixed in volume and comprised of cranial mass, CSF, and blood
- As volume of one component increase, the volume of the other components decrease, or the intracranial pressure

- Minimizing increases in ICP is an important goal of anesthetic management
  - Autoregulation of cerebral blood flow
  - ICP is influenced by changes in cerebral blood flow (CBF). As CBF increases, so does ICP
  - Careful monitoring of fluid balance
  - CPP = MAP – ICP
  - Medical therapy - mannitol, furosemide, corticosteroids
  -

- Anesthetic management usually not difficult, however we must consider that a myelography is usually part of the diagnostic workup
  - Myelography potentially causes seizures during the recovery period
  - Avoid anesthetic agents that may potentiate seizure disorders
  - Be prepared to treat seizures during recovery
    - Post-myelographic seizures usually present initially with twitching around the eyes and lips, then spread throughout the body
    - Rapid administration of 0.5 – 2 mg/kg diazepam IV at the onset of a seizure as first line of defense
    - If seizures persist, then pentobarbital or phenobarbital is the next in line...
- Movement of the patient during anesthesia must be done carefully!
  - While awake, the patient uses muscle rigidity to 'splint' the affected area of the spine, and limit further damage
  - Under anesthesia, the muscle relaxation we produce removes this mode of self protection
  - Critical to move the patients carefully, with minimal twisting or flexing of the spine
  - Potential exists to exacerbate the condition, produce more cord trauma
-