Assessing Acute Abdomen

Wendy Blount, DVM

DDx Acute Abdomen

Acute Abdomen
- Rapid onset of abdominal pain
- Acute onset of clinical signs related to abdominal pathology
- Potentially life threatening

Determine quickly whether abdominal surgery is necessary

DDx Acute Abdomen

GI Tract
Urogenital Tract
Hepatobiliary System
Spleen & Lymphatic
Other causes
Things that may mimic acute abdomen

DDx Acute Abdomen

GI Tract
- Ischemia – thrombus and/or embolism of mesenteric a or portal vein
- Obstruction – foreign body, intramural, extra-intestinal, intussusception
- Twist – GDV, mesenteric volvulus, duodeonocolic ligament entrapment, torsion around pedunculated mass
- Gastroenteritis (viral, bacterial, toxic, HGE)
- Pancreatitis
- Colitis, Obstipation
- Necrosis - rupture, ulceration, perforation, surgery dehiscence

DDx Acute Abdomen

Urogenital Tract
- Pyometra – + uterine rupture
- Dystocia – + fetal necrosis, + uterine rupture
- Vaginal rupture – + rectovaginal fistula
- Cystic calculi - + ureteral obstruction, urethral obstruction
- Uroabdomen – ruptured kidney, ureter, bladder
- UTI – pyelonephritis, renal abscess
- Testicular torsion

DDx Acute Abdomen

Hepatobiliary
- Acute hepatitis/cholangiohepatitis
- Cholecystitis – + gall bladder rupture
- Biliary obstruction – + gall bladder rupture (stone, mass, mucocoele)
- Hepatic abscess – + rupture
- Liver lobe torsion
DDx Acute Abdomen
Spleen & Lymphatic

- Rapidly growing splenic mass
- Splenic torsion
- Splenic rupture – hemobadomen (trauma, hematoma, neoplasia)
- Splenic abscess – + rupture
- Mesenteric abscess – + rupture

DDx Acute Abdomen
Other Causes

- Trauma – evisceration, hemoabdomen, retroperitoneal hemorrhage, penetrating wounds, crushing injury
- Neoplasia
- Strangulated hernia
- Pansteatitis

Any of these things can cause severe abdominal pain and/or peritonitis

DDx Acute Abdomen
Things that Mimic

- Spinal Pain
- Lead poisoning
- Hypoadrenocorticism
- Anaphylaxis

Any of these things can cause severe abdominal pain and/or peritonitis

Assessment of Collapse

Quick Assessment
Life Saving Treatment
Physical Exam
Emergency Diagnostics
History
In House Diagnostics

Assessment of Collapse

Quick Assessment
Airway
Breathing
Circulation
Vital Signs – TPR & BP
Diagnostic Centesis
thorax, abdomen

Life Saving Treatment
Oxygen
IV fluids and colloids
Therapeutic centesis
Thorax, abdomen, pericardium
Normalize temperature
Emergency Surgery
Assessment of Collapse

Physical Exam
  General Exam
  Cardiovascular Exam
  Neurologic Exam

Emergency Diagnostics
  PCV, TP, glucose, BUN, creat
  Blood gases/lytes
  ECG
  Radiographs
  Lateral thorax
  Lateral abdomen
  FAST ultrasound

Assessment of Collapse

Quick Assessment
Life Saving Treatment
Physical Exam
Emergency Diagnostics
  History
  In House Diagnostics

In House Diagnostics
  CBC, profile, UA - Get urine prior to fluid therapy
  Heartworm test in dogs
  FeLV/FIV in cats
  Coag - PT, PTT/ACT, BMBT
  Complete abdomen US

Quick Assessment

Get samples to run later
  - Blood (8-10cc)
    - EDTA tube
    - Lithium heparin tube
    - Potassium citrate tube
    - Red top clot tube
  - Urine

Emergency Exam Form Cat
Emergency Dog Exam Form
Resuscitation Flow Sheet
Quick Assessment

**Urinalysis**
- If you need a urinalysis later, you need a sample prior to fluid therapy, before specific gravity is diluted.
- If fever, you may want urine for possible culture prior to antibiotic therapy.
- Use a 5Fr infant feeding tube to catheterize male dog > 75 pounds.
- Use US guidance if needed for cystocentesis of small bladder.

**Indications for Diagnostic Abdominocentesis**
- Palpable fluid wave
- Owner reports abdominal bloating
- Suspect abdominal hemorrhage
  - Acute collapse, pale mucous membranes, weak pulses, low blood pressure, + anemia
  - Suspect peritonitis – shock and abdominal pain
- Fluid seen on FAST ultrasound

**Diagnostic abdominal tap technique – 4 quadrants**
- R cranial, L cranial, R caudal, L caudal
- Syringe and 18-20g needle are fine
- Put fluid in EDTA and red top tubes for analysis
- Spin down for cytology
- Save red top tube for culture if needed
- Run EDTA through CBC machine for cell counts
- Be aware that you can fill the syringe with blood if you hit a normal spleen – try RCr

**Fluid Therapy**

"Shock/Replacement Fluids"
- Bolus of 10 ml/lb over 10-15 minutes, then reassess
- NO shock fluids if there is anuria or CHF (Angel)
  - Anuria - you can probably get away with one shock dose if the dog hasn’t had prior fluid therapy
- MONITOR URINE OUTPUT AFTER THE SHOCK DOSE

"Maintenance Fluids"
- 1-2 ml/lb/hr – fine tune later
- To keep the IV line open while the patient is assessed
- Most patients fall under this category

**No Fluids – if CHF is possible**
- Heart murmur
- Auscultable arrhythmia or pulse deficits
- Undiagnosed thoracic effusion or ascites – modified transudate
- Dyspneic animal who has not had chest x-rays yet
- Be especially careful with cats
- Fluids, corticosteroids or x-rays can KILL a cat in CHF
### Fluid Therapy

**Colloids**
- Hetastarch 15-20 ml/lb per 24 hours
- Give over 15-20 minutes
- Plasma 5-10 ml/lb/day
- Premedicate with diphenhydramine
- Give over 1-2 hours

### Ascites

**Transudate or Modified Transudate**
- Remove enough fluid to alleviate dyspnea, and allow comfortable chest x-rays & abdominal ultrasound
- Bloodwork and abdominal ultrasound to determine the cause, and treat accordingly
- If cause is congestive heart failure, remove all fluid

**Hemorrhage - usually a surgical problem, unless**
- Coagulopathy is identified and treated
- Traumatic hemorrhage resolves spontaneously

**Non-septic exudate, chyle – tap if dyspneic**
- Imaging determines whether the problem is surgical

### Ascites

**Septic exudate, uroabdomen, bile peritonitis – usually surgical**
- Multiple species of bacteria suggest GI perforation
- Plant material is very strong evidence
- If no bacteria are seen, look for phagocytosed bacteria in WBC, and for toxic changes in the neutrophils

Abdominal amylase and lipase elevated relative to serum with pancreatitis
Abdominal fluid glucose <50 mg/dl is often indicative of bacterial peritonitis

### History

**Acute collapse over minutes, then acute abdomen**
- Rapid hemorrhage – trauma or spontaneous
- Rupture of abdominal abscess
- Anaphylaxis
  - After insect bite, snake bite, vaccination
  - After heartworm prevention in untested dog (milbemycin)
  - After going outside

**Protracted dysuria, pollakuria**
- Urinary obstruction

**Estrus about a month ago**
- Pyometra

**Eating carrion or garbage**
- HGE – hemorrhagic gastroenteritis
- Foreign body obstruction
- Botulism – flaccid paralysis
- Roquefortine toxin – seizures and twitching
History

Pattern recognition for prostatitis
- Male dog
- Fever
- Caudal abdominal pain
- Hematuria (especially dripping)
- Hindlimb stiffness or an abnormal gait
- Signs of sepsis
- Pollakuria or even urinary obstruction
- Dyschezia

Profuse and frequent vomiting
- Foreign body obstruction
- Pancreatitis
PU-PD
- Sepsis, DKA, pyelonephritis, Addison's
Melena
- Gut necrosis
- GI mass
- Bleeding ulcer

Physical Exam

Heart Rate
- Sinus Bradycardia – confirm with lead II ECG
  - Increased vagal tone –
    - Increased CSF pressure
    - Abdominal disease
    - Tracheal trauma
    - Increased IOP
    - Retching
    - Give atropine or glycopyrrolate and recheck

- Sinus Tachycardia – confirm with lead II ECG
  - Pain or anxiety
    - GI pain meds
    - Hypovolemic shock
    - Increase the fluid rate
    - Heart failure
    - Pericardial tamponade
    - Tap and give IV fluid bolus

Mucous Membrane Color
- Cyanosis
  - Respiratory failure – airway obstruction, alveolar disease or pleural/pericardial disease (air/fluid/organ)
  - Congestive heart failure
  - Pulmonary hypertension
- Differential cyanosis
  - Pink in front, blue in back (Reverse PDA or FATE)
- Brick red mucous membranes
  - Sepsis – do CBC, and albumin
  - HGE (hemorrhagic gastroenteritis in dogs)
  - SIRS

- Icterus – yellow mucous membranes
  - Check CBC first to rule out hemolysis
  - If anemic, check saline test for autoagglutination
  - If anemic, check blood smear cytology for Mycoplasma haemofelis
  - If not anemic, you are left with hepatic disease (including sepsis) or bile obstruction
    - No point doing bile acids if bilirubin is high (you know they are high)
    - Abdominal US is more helpful
Physical Exam

Mucous Membrane Color
- Pallor
- Pain
- Cardiovascular shock
- Anaphylactic shock
- Anemia
- Hypovolemia – hemorrhage, hypoproteinemia

CRT > 2 sec means poor peripheral perfusion

Respirations
- Minimal chest excursions can indicate LMN paralysis or severe shock
- Exaggerated chest excursions
- Cardiovascular failure
- Respiratory failure – lung disease, airway disease, third space disease
- Aspiration pneumonia due to vomiting-regurgitation
- Anemia or other oxygen carrying problem
- Metabolic acidosis

Physical Exam

Respirations
- Minimal chest excursions can indicate LMN paralysis or severe shock
- Exaggerated chest excursions
- Cardiovascular failure
- Respiratory failure – lung disease, airway disease, third space disease
- Aspiration pneumonia due to vomiting-regurgitation
- Anemia or other oxygen carrying problem
- Metabolic acidosis

Pulses
- Jugular pulses
  - Hepatopulmonary reflex
    - apply pressure to the liver for 5-10 seconds
    - Filling of the jugular veins indicates right heart failure or pericardial disease
- Peripheral Pulses
  - Weak pulses
    - CHF
    - Pericardial disease
    - Shock of any kind, especially hypovolemic
    - Hypertension
  - Bounding pulses
    - Fever/Sepsis (vasodilation makes diastolic pressure lower)
    - PDA (back flow during systole)
    - Aortic endocarditis (black flow during systole)
    - Extreme bradycardia (volume overload)
    - Anemia (low blood viscosity)
    - Pulsus paradoxus – absent during peak inspiration
    - Pericardial effusion or hernia
    - No pulses in only one area
    - Thromboembolic disease

Physical Exam

Pulses
- Peripheral Pulses
  - Bounding pulses - Big difference in pressure between systole and diastole
    - Fever/Sepsis (vasodilation makes diastolic pressure lower)
    - PDA (back flow during systole)
    - Aortic endocarditis (black flow during systole)
    - Extreme bradycardia (volume overload)
    - Anemia (low blood viscosity)
    - Pulsus paradoxus – absent during peak inspiration
    - Pericardial effusion or hernia
    - No pulses in only one area
    - Thromboembolic disease

Physical Exam

Skin
- Hemorrhages might indicate coagulopathy – do coags
- Ecchymoses and petechiae
- Peripheral edema
- Right heart failure
- Vasculitis, venous or lymphatic obstruction
- Hypoalbuminemia
- Infiltrative tumor such as myxosarcoma can look like edema

Abdominal Palpation
- Distension
  - Obesity, pendulous abdomen
  - Pregnancy, pyometra - ultrasound
  - Balotte fluid wave – tap
  - Palpate organomegaly – ultrasound
  - Relieve urinary obstruction or express bladder
- Abdominal mass – ultrasound
  - If cystic masses, may not be safe to aspirate
  - Can aspirate solid masses later
  - Aspirate homogeneous enlarged spleen (MCT, Lymphoma)
Physical Exam

Abdominal Palpation

- Distension
  - Gut distended with gas – radiograph
  - Pass stomach tube if gastric
  - Pneumoperitoneum can cause some gas in the abdomen
  - Tympanic abdomen in a large dog is usually GDV

- Severe abdominal pain is often surgical, especially if the pain is focal
  - Think peritonitis when you have shock and severe abdominal pain
  - If a pyometra is painful, think peritonitis
  - Uroabdomen painful only if infected or acute

- How do you diagnose peritonitis and decide to go to surgery?
  - Get some abdominal fluid, spin down, look for bacteria
  - Diagnostic peritoneal lavage if necessary
  - Most but not all animals with peritonitis have ascites

Diagnostic Peritoneal lavage

- Place a large bore IV catheter into the abdomen on the ventral midline
- Collect samples for fluid analysis, culture
- Attach IV set and infuse 5-10 ml/lb sterile isotonic fluids
- Remove catheter, palpate abdomen
- Let sit for 30 minutes
- Do single or 4 quadrant abdominocentesis
- Drain out as much fluid as possible, saving some for cytology, culture

Differentiating abdominal pain from spinal pain

- If neck pain, palpate the lower neck from ventral
- Gently check range of motion of neck in all 4 directions
- Palpate along the dorsal spinous processes without touching the abdomen
- Lift the tail
- Check for neurologic deficits
- Crying out when picked up is more often due to spinal pain than abdominal pain

Hemoabdomen

- Pressure wrap on the cranial abdomen can slow hemorrhage
- Can collect the blood, run it through a blood administration set and give it back to the IV compartment

Emergency Bloodwork

- CBC with platelets
- General health profile – include P, Ca**, albumin and triglycerides
- Electrolytes and blood gases
- Urinalysis

In House Diagnostics

Emergency Bloodwork

- CBC with platelets
- General health profile – include P, Ca**, albumin and triglycerides
- Electrolytes and blood gases
- Urinalysis
**Drug Therapy**

**Broad spectrum IV antibiotics**
- As soon as sepsis is suspected or identified
- Ampicillin + cefixotin
- Ampicillin + enrofloxacin
- Ampicillin + amikacin (if not hypovolemic)
- Can substitute metronidazole for ampicillin, but give slowly, and it is less broad spectrum

**Heparin**
- If DIC – 75 U/kg SC TID

**Corticosteroids**
- Use for sepsis is controversial
- Single moderate dose is best
- Not with NSAIDs

**Neupogen (Granulocyte Colony Stimulating Factor)**
- If neutrophilia is acute, this can improve survival

**Imaging**

**Abdominal rads**
- Superior to US for finding intestinal obstruction or foreign body
- Better then US for evaluating gas in the abdomen
- DDx Pneumoperitoneum:
  - Rupture of hollow viscus
  - Gas forming bacteria
  - Therapeutic abdominocentesis or recent surgery/laparoscopy – days to weeks
  - Penetrating injury

**Abdominal Ultrasound - FAST**
- Focused Assessment with Sonography in Trauma
  - Early recognition of intraperitoneal blood
  - Rapid, safe and sensitive
  - Can be repeated if the patient’s status changes
  - Help prioritize initial management in patients with multiple penetrating injuries or an unknown missile trajectory
  - Sensitivity for determining need for surgery is 50% in people

**Imaging**

**Acute Abdomen Surgery**
- Collect peritoneal fluid for analysis & culture/sensitivity
- Identify and resolve sources of acute hemorrhage
- Identity, debride, remove, lavage necrotic tissues
- Identify and resolve GI/urinary obstruction
- Run the gut
- Assess and treat for generalized or localized peritonitis
- Contain the evil spirits
- Collect diagnostic samples

**Imaging**

**Diagnostic Surgery – Canine Samples**
- Liver
- Stomach, duodenum, jejunum, ileum
- Mesenteric lymph node
- Aspirate spleen for cytology
- Evaluate and sample if abnormal:
  - Spleen, kidneys, colon, bladder, prostate, ovaries/uterus
  - Other lymph nodes (hepatic, sublumbar)
  - Pancreas, gall bladder and adrenals only if absolutely necessary
### Imaging

**Diagnostic Surgery – Feline Samples**
- Liver
- Stomach, duodenum, jejunum, ileum
- Pancreas
- Mesenteric lymph node
- Aspirate spleen for cytology
- Evaluate and sample if abnormal:
  - Spleen, kidneys, colon, bladder (repro organs)
  - Other lymph nodes (hepatic, sublumbar)
  - Gall bladder and adrenals only if absolutely necessary

### Handouts

**PowerPoint Presentation** – after the gold tab
**Clinic Handouts**
- Coagulopathy Diagnostic Chart
- CPR Flow Sheet
- Emergency Exam Cat
- Emergency Exam Dog