Imaging the Gastrointestinal Tract

VMB 960
April 7, 2008

Reading
• Chapters 45-47
  – Pages 750-805

Anatomy (lateral radiograph)

Dog
Cat
Anatomy (ventrodorsal)

Dog
Cat

Gas rises!

<table>
<thead>
<tr>
<th></th>
<th>Fundus</th>
<th>Pylorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Lat</td>
<td>Gas</td>
<td>Fluid</td>
</tr>
<tr>
<td>L Lat</td>
<td>Fluid</td>
<td>Gas</td>
</tr>
<tr>
<td>VD</td>
<td>Fluid</td>
<td>Gas</td>
</tr>
<tr>
<td>DV</td>
<td>Gas</td>
<td>Fluid</td>
</tr>
</tbody>
</table>
Small intestine

- Small intestine
  - Seen normally with gas or fluid
  - Cannot tell bowel wall thickness without contrast medium present

Ileus

- The failure of movement
- Divided into functional and mechanical
  - Functional
    - Problem with motility due to any cause
  - Mechanical
    - Physical obstruction impeding flow
Remember, large animals stand!

Don’t forget foreign bodies
Remember!!

- If you can’t see the foreign body
  - Try another view
- The question to ask
  - Is the small intestine bigger than it should be?
  - Cat < 13 mm diameter
  - Dog < the size of the colon

To contrast or not to contrast

- Luminal obstructions
- Motility
- Rupture
- Function
  - Not quantitative but qualitative
Contraindications

- Radiography or ultrasound highly suggestive of obstruction
  - Ileus
- Suspected Perforation
- Acute abdominal pain
- Large volume of ingesta in stomach

Upper GI examination

- Very time consuming
  - Usually takes about 4 hours
- Low yield due to decreased motility
- Generally replaced with ultrasound

Barium

PROs
- Coats well
- Tasty
- Not absorbed via GI tract

CONs
- Not sterile
- Generates granulomas in body cavities
Iodine contrast media

**Non-ionic**

**Ionic**

Iodine Contrast

**PROs**
- Sterile
  - IV or urinary bladder
- Safe in body cavities

**CONs**
- Inflammatory reaction in lungs
- Can induce emesis
- Allergic reactions
  - Seizures
  - Renal failure
  - Pulmonary edema

Procedure

- Nothing per os for 12-24 hours
- Use stomach tube
- No medications
- No sedatives
Dose
• 6-10 ml per pound of body weight
• Need to deliver as a bolus
  – Stomach starts emptying liquid fast

Delivery methods
Radiographic views

- Immediately (RL, LL, VD, DV)
- 15-30 min (RL, VD)
- 30-60 min (RL, VD)
- Hourly until barium in colon

Normal transit time (approximately)

- 15 min – barium in duodenum
- 30 min – jejunum well filled
- 1-2 hours – stomach empty
- 2-4 hours – enters colon
- 6 hours – jejunum empty
Normal variants

- Canine pseudoulcers
  - Peyer’s Patches
- Feline “string of pearls”

Feline  Canine

Pseudoulcers (Peyer’s Patches)
Small Intestine

- Evaluate the small intestine
- Can see flocculation
- Fimbriation (wispeness)

Patterns with contrast media

- Infiltrative bowel disease
- Linear foreign bodies
- Obstruction
  - Annular
  - Intraluminal

“Thumbprinting”

- Regularly spaces divots
- Inflammation/infiltration
- Lymphocytic-plasmocytic enteritis
- Parvovirus
- Lymphoma
- Eosinophilic infiltration
Thumbprinting

Linear foreign body

Ultrasound is faster and better
**Chronic partial bowel obstruction**

- Can get quite large and distended
- Specific syndrome in Siamese
- Distal ileal adenocarcinoma
- Generally the mass is palpable

**Partial obstruction**

**Chronic annular mass**

- Lymphoma or adenocarcinoma

[Click here for movie]
Intraluminal object

• With contrast medium – filling defect
  – Even if radio-opaque on survey

Complications

• Barium in lung
  – Only problem with large volume
• Stop radiographs too soon
• Insufficient volume of barium
• Decreases absorption of medications
4 hours after administration

- Treated with anti-diarrhea drugs

BIPS

- Barium Impregnated Polyethylene Spheres
- Two diameters
  - 1.5 mm – empties with food
  - 5 mm – designed to detect obstructions
- Not very reliable

24 hours after BIPS
**Conclusion**

- Positioning is key
  - If you are not sure, take another view
- Contrast procedures
  - Barium is better than Iodine
  - Long time for a good study
  - Ultrasound is becoming more useful