Abdominal Imaging: The practical Utility of Radiography and Ultrasound

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Life is hard

- Internist
- Surgeon
- Oncologist
- Neurologist
- Dermatologist
- Radiologist!!!
  - The digital era has lightened the load

Question?

- Patient Concerns
  - In need of imaging
- Client Concerns
  - $$
- Logistics
  - New DR System

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Radiology Report

History:
Intermittent vomiting, elevated liver enzymes

Findings:
Blah, blah, blah

Conclusions:
Blah, blah, blah

Recommendations:
ABDOMINAL ULTRASOUND!!!
The Pros and Cons

**PROS**
- Bone
- Gas
- Comfort
- Digital
- Independent
- Availability
- Spatial Res

**CONS**
- Super
- Contrast
- Radiation

Approaching the Rad (Interpretation Paradigm)

1. Extra-ab structures
2. Peritoneal/Retro space
3. GI +
4. Urogenital +
Chino

- 14 yr MN Shepherd X
- 1 month Hx of Wt. loss
- Inappetence, intermittent vomiting and diarrhea
- PE: BCS 3/9 and palpable soft, gas filled bowel
- Blood Chem/CBC/UA/T4: WNL

Possible differentials for Chino:

- Abdominal mass or obstruction
  - Rads, US, Exlap
- Nonprimary GI dz
  - R/O with labs
- Primary GI dz
  - Inflammatory (-itis, IBD)
  - Partial obstruction
  - Motility disorder

Chino
Radiographic diagnosis: Small intestinal obstruction
Chino's Ultrasound:
Ultrasound Diagnosis:
Small intestinal obstruction secondary to SI mass
Jejunal Adenocarcinoma

COMPARISON OF RADIOGRAPHY AND ULTRASOUND FOR DIAGNOSES OF SMALL-INTESTINAL MECHANICAL OBSTRUCTION IN VOMITING DOGS

- Cross sectional study of acutely V dogs (82)
- Definitive Results
  - Rads 27/82 (33%)
  - US 80/82 (97%)
- Concluded both are accurate
- BUT... US had > accuracy < equivocal results > confidence

Can you identify the colon?
Sweetie

• 10 yr MN DSH
• Vomiting
Sweetie

• Radiographic Findings: markedly distended segment of small intestine
• Radiographic Diagnosis: small intestinal obstruction
• Surgical Diagnosis: Terminal ileal neoplasm

Reba

• 4 yr Fl Doberman Pinscher
• History of abdominal distention (5 hrs)
• Vomiting and ptalism

Reba

Radiographic Diagnosis: GDV
Little Bill

- 8 yr MN DSH
- History of hematochezia with otherwise normal feces
- Elevated renal values

Radiographic diagnosis: Irregular kidneys, left nephrolith, mineral body in right retroperitoneal, unremarkable colon
Abby

- 12 yr FS JRT
- 3 week history of hematuria, culture positive UTI/MIC
- Hematuria continued despite abx treatment

Abby
Normal survey radiographs

Abby
Diagnosis: Left hydronephrosis, Left hydroureter, filling defect in UB
Abby IVP
Diagnosis: Left hydronephrosis, Left hydroureter, filling defect in UB

Sady
• 10 yr FS Labrador
• 3 week history of lethargy and losing weight
• No vomiting or diarrhea
• CBC/Blood chemistry pending

Findings: Slight loss of abdominal serosal detail in the mid abdomen
Sady

- Differentials?
- Small amount of peritoneal effusion
- Focal peritonitis
- Mesenteric lymphadenopathy

Next step? ABDOMINAL ULTRASOUND!!!
The Human Side

Recent Trends in Utilization Rates of Abdominal Imaging: The Relative Roles of Radiologists and Nonradiologist Physicians

- 1000 Medicare patients 1996 to 2005
- Abdominal imaging increased 25% overall
- Greatest growth in CT/CT contrast (141%)
- Ultrasound had a 12% increase
- Plain abdominal radiography deceased -13%
- Radiologists dominate market share at 90%

JACR 2008

The Human Side

Abdominal Imaging utilization in the emergency department: trends over two decades

- 1000 Adults on ED visits from 1990 to 2009
- The number of CT examinations increased 17-fold and US increased 52%
- Radiography decreased 82%
- Conclusion: CT has replaced radiography as the most common imaging modality for ED visits

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Conclusion

- Abdominal radiography and ultrasound work well together
- Some cases warrant ultrasound examination without X-rays
- Abdominal radiographs infrequently provide a definitive diagnosis
- Save up for a new 64-slice CT scanner