The cranial abdomen: Liver and Spleen

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Reading

• Chapter 41 in Thrall

Imaging the cranial abdomen

• Thickest part of the body
• Difficult to get enough contrast
• Place thickest part of the patient towards the cathode
  – Heel effect
Cranial abdomen

- Multiple structures
  - Liver
  - Spleen
  - Stomach
  - Pancreas
  - Small intestine
  - Transverse colon

Other modalities

MRI

CT

Ultrasound
**Liver**

- Just caudal to the diaphragm
- Cranial to the stomach
  - Liver size influences gastric axis

**Gastric axis**

**Liver or Spleen?**

LIVER!

If it extends cranial to the antrum of the stomach
Hepatomegaly

- Rounding of the liver margin
- Extends well beyond the costal arch
- Caudodorsal shift of the gastric axis

Causes for hepatomegaly

- Hepatic venous congestion
- Neoplasia (lymphoma)
- Hyperadrenocorticism
  - Steroid hepatopathy
- Diabetes mellitus
- Hepatic lipidosis
- Acute hepatitis
**Radiographs**

- Since radiographs just give shape
  - Hard to narrow differentials
- Need other modalities
  - Ultrasound
  - CT or MRI becoming more available

**Focal hepatomegaly**

- Neoplasia
- Abscess
- Cyst
- Biloma
- Liver lobe torsion (rare)

**Focal Liver mass**
**Biliary carcinoma**

**Small liver**
- Hard to define
- Upright gastric axis
- Difficult to evaluate with ultrasound
  - Lungs get in the way
Differential diagnoses

- Chronic liver disease
  - Cirrhosis
  - Hepatitis
- Portosystemic shunt
- Diaphragmatic hernia

Portosystemic shunt

- Abnormal communication
  - Portal vein or tributary
  - Caudal vena cava or azygous vein
- Multiple ways to detect

Contrast medium portography
Extrahepatic portosystemic shunt

Pros and Cons
- Good visualization
- Hepatic vasculature
- Invasive
  - Surgical approach
- Contrast medium
  - Complications
- Time
  - Hypothermia
  - Catheter removal

Nuclear medicine
- Gold standard
- Administer radioisotope per rectum
  - $^{99m}$ technetium pertechnetate
- Enters colic vein to portal vein
- Yes or no, but no anatomic data
  - Surgeons cannot use as a guide
Normal scintigram

Portosystemic shunt

Nothings perfect

- Microvasculature dysplasia
  - No gross vessel problem
  - Defect is at the capillary level
- Looks like normal scintigram
Ultrasound

- Can be 95 – 100 % accurate
  - Is operator dependant
- Patients usually quite small
- Patients usually do not like process

Normal ultrasound appearance
Intrahepatic portosystemic shunt

Other findings

Computed tomography

• Still requires contrast medium
  – Usually debilitated patients
• Less time with helical scanners
• Can do 3D reconstruction
**MRI**

- No contrast needed
  - Can do a “Time of Flight”
  - Allows blood to be its own contrast!
- Moderate amount of time
  - Depends on magnet

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**MRI splenocaval shunt**

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**Gall Bladder**

- Look for stones or mineral
  - Can see with radiography or ultrasound
- Difficult to tell if important
  - Ultrasound can help
  - Especially with cholecystitis
Intrahepatic cholelithasis

Cholecystitis

- Generally radiographs not helpful
- Ultrasound helps more
The spleen

- Generally surrounded by fat
- Very clear on radiography
- Sedation can increase spleen size

Dog spleen

Cat spleen
**Spleen**

- Not many things happen to spleen
- Separate into diffuse and focal disease
- Radiographs give an idea
  - Ultrasound more helpful for seeing small lesions within parenchyma

**Diffuse spleen enlargement**

- Neoplasia
  - Lymphoma
  - Mast cell disease
- Congestion
  - Sedation
  - Right heart failure
- Splenic torsion
- IMHA
- Inflammation
- Infarction
- Nodular hyperplasia
- Extramedullary hematopoiesis

**Splenic torsion**
Splenic torsion

Splenic lymphoma

Splenic lymphoma
Solitary splenic mass

- Neoplasia
  - Hemangiosarcoma
  - Hemangioma
- Nodular hyperplasia
- Hematoma
- Abscess

Splenic mass

Splenic mass
**Conclusion**

- Liver is cranial to the stomach
  - Spleen is just caudal
- Radiographs outline organ
- Cross sectional modalities
  - Ultrasound, CT and MRI
- Nuclear medicine
  - Portosystemic shunts