

Rachel Pollard

DVM, PhD, Dipl.ACVR, Professor Emerita, UC Davis SVM,

Lead Instructor Digital DIVA

Imaging of the Abdominal Cavity

Learning Objectives

How to systematically evaluate abdominal radiographs

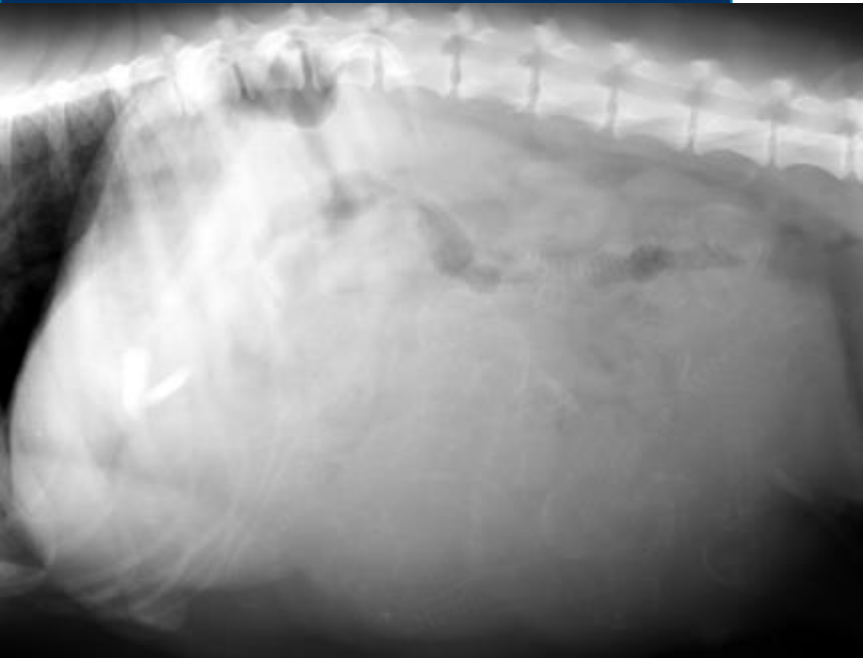
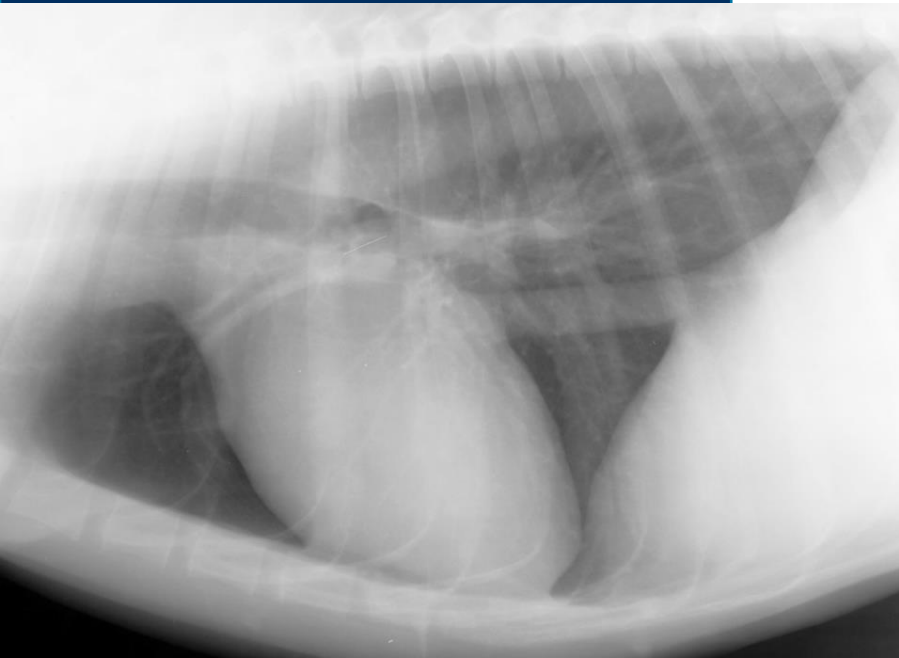
Understand normal radiographic anatomy of the peritoneal cavity and retroperitoneal space

Understand pro's and con's of radiography and ultrasound of the abdomen

How to identify basic abdominal pathology through case examples and using baseline imaging principles

Thorax vs. Abdomen

- Smaller structures are visible
- More natural contrast
- More respiratory motion



The Systematic Approach to the Abdomen

- Work your way from the outside in
 - Skeletal structures
 - Visible thorax
 - Peritoneal detail
 - Retroperitoneal space
 - The big 5
 - GI
- Focus on everything other than what you expect to have the problem first
 - If the patient presents for a heart murmur, look at everything else before looking at the heart

The Systematic Approach to the Abdomen

- Work your way from the outside in

**FIND YOUR
FRIENDS**

Focus on everything other than what you expect to have
the problem first

- If the patient presents for a heart murmur, look at everything else before looking at the heart

Case Example-Linus

- 8 YO MC Bassett
- Intermittent vomiting
- Loosing weight recently



Technical Considerations

- Exposure factors
- Views
- Positioning

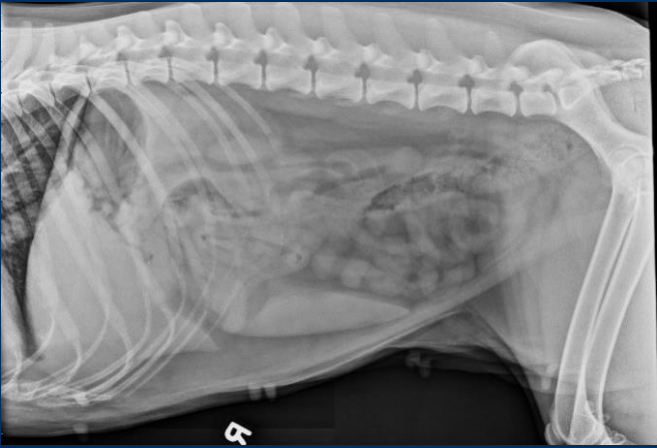


Views

- Standard
 - Right lateral
 - Left lateral
 - VD
- Special
 - DV
 - Horizontal beam



Exposure Factors-Key Concepts



Abdomen- 75 kVp

- Moderate natural contrast
 - Air, bone, fat, soft tissue
- Lower kVp, higher mAs
 - High contrast
 - Opposite of thorax
- Lower kVp results in better organ definition

Right vs. Left-Key concepts



R

- Right lateral
 - gas is in the fundus of the stomach
- Left lateral
 - gas is in the pylorus and duodenum



L

Linus

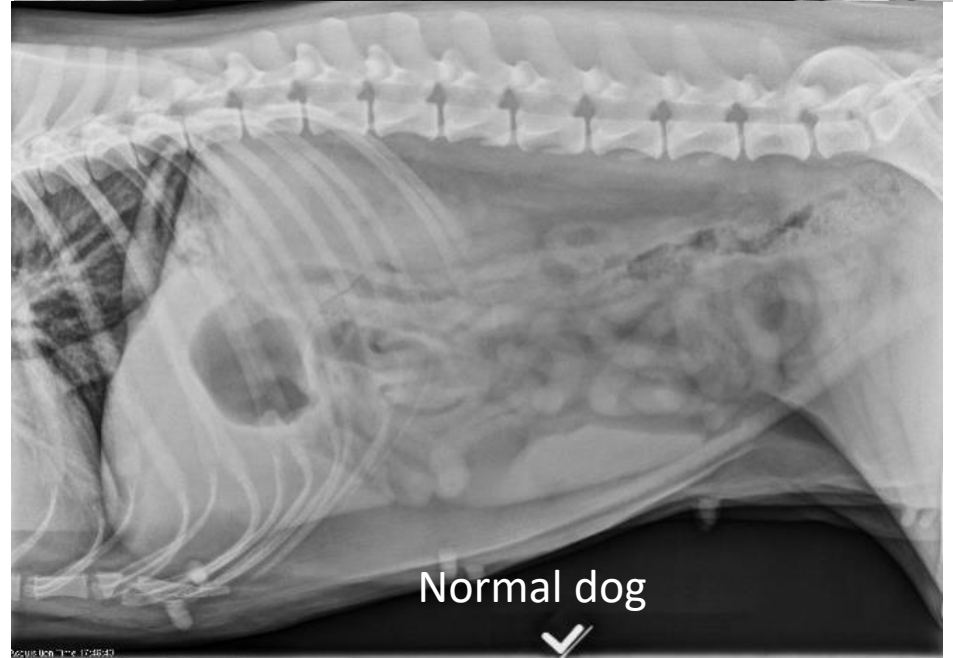
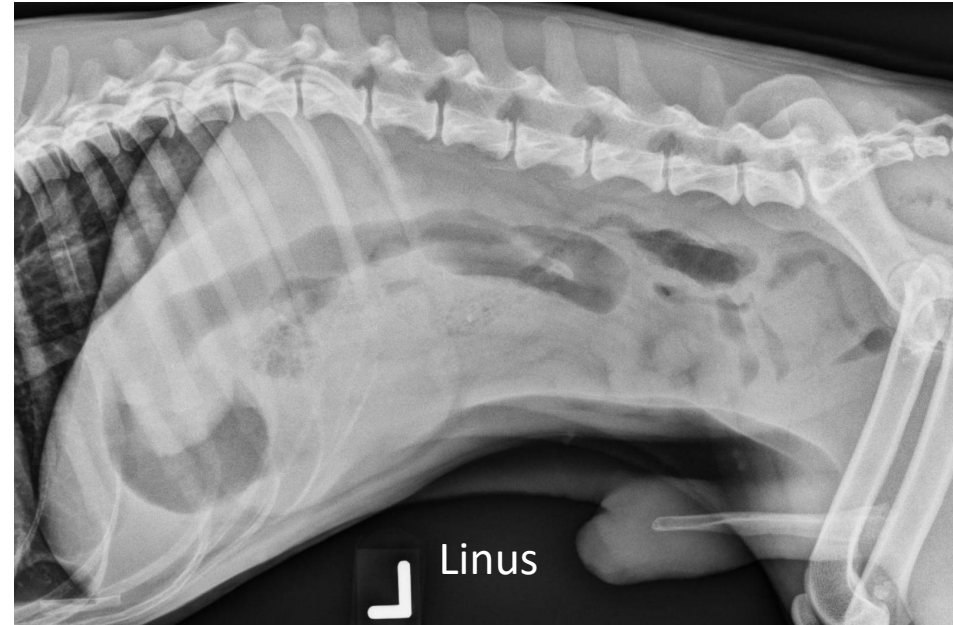


Linus



Comparison

- Linus has a:
 - Sock in his intestine
 - Liver tumor
 - Pyloric mass
 - Space alien in his spleen



Comparison

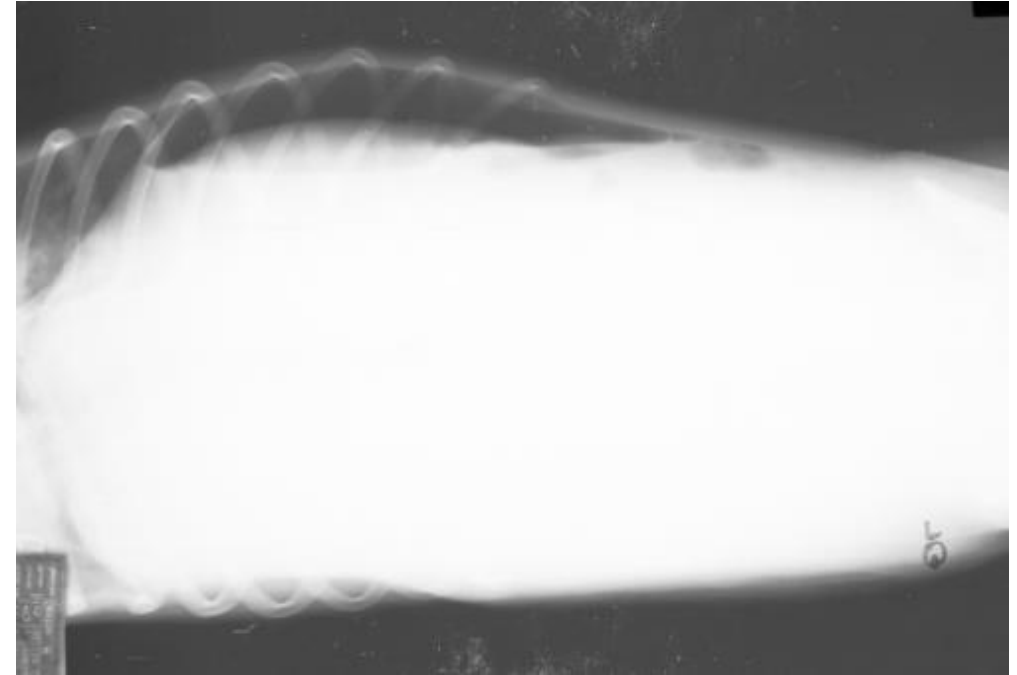


Ty's Tips

- Whenever you are worried about a foreign body obstruction of the gastrointestinal system, ALWAYS take a 3 view study
 - Right lateral
 - Left lateral
 - Ventrodorsal

3 view study (both laterals)

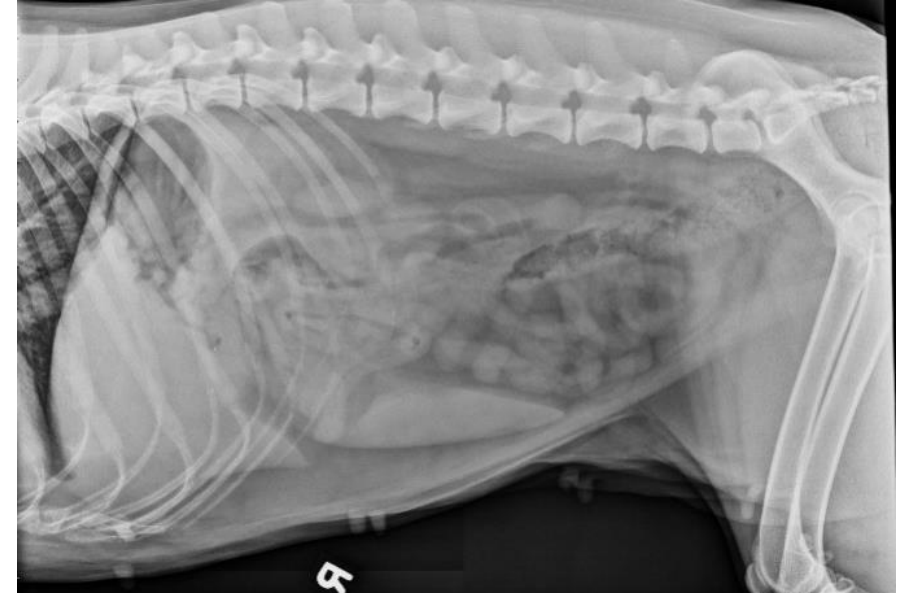
Horizontal beam
study →



- Best when looking for small amounts of free abdominal air

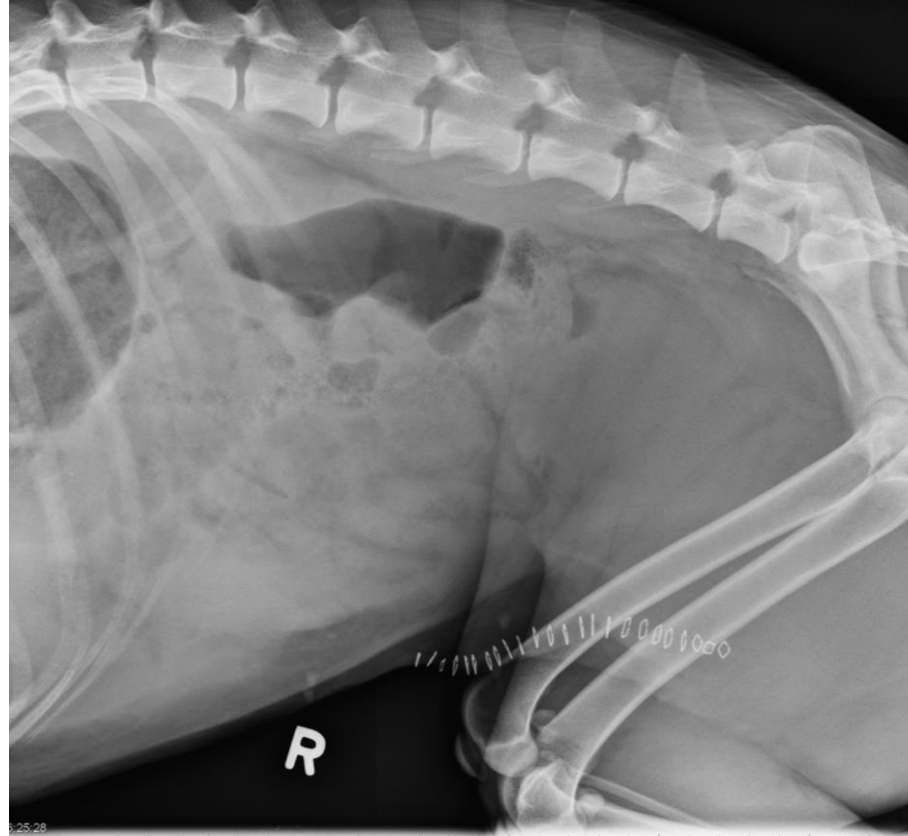
Positioning

- Diaphragm to pelvis
- Flat on lateral, straight on VD
- Legs back
- Include perineum when looking for urethral calculi



KEY CONCEPTS

Positioning Pitfalls



- The legs should be extended caudally to allow complete visualization of the caudal abdomen.

Find Your Friends-Liver



Find Your Friends-Spleen



Find Your Friends-Kidneys



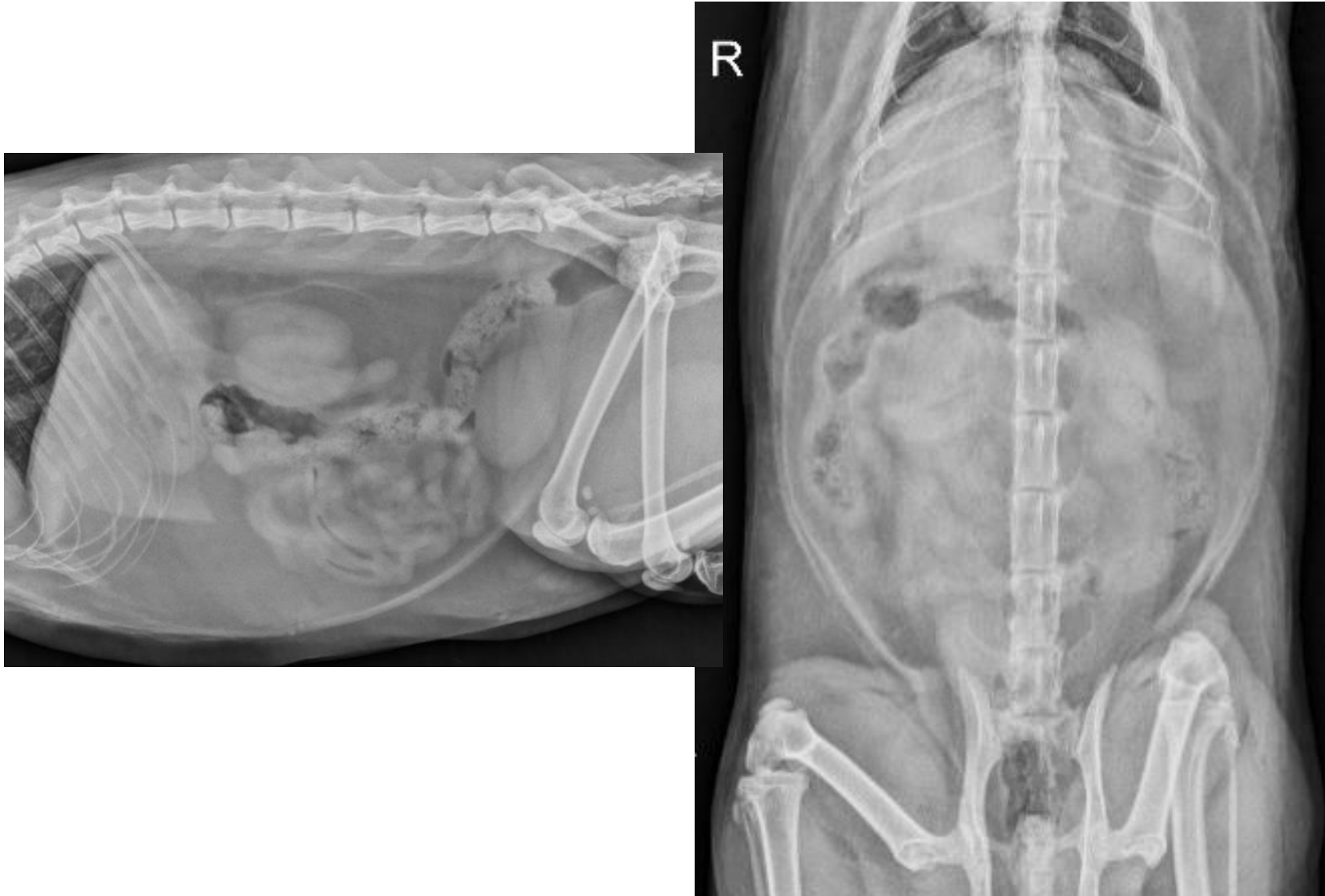
Find Your Friends-Bladder



Find Your Friends-GI



Feline Abdomen



Feline Abdomen



Quiz Question!



Quiz Question!

- Air
- Fat
- Fluid
- Soft tissue
- Metal



Case Example-Barney

- 10 YO FS Rottweiler
- Anorexia and lethargy
- Emaciated but with pendulous abdomen





11/29/33



The Competition



- Ultrasound
 - Faster
 - Cheaper
 - Less invasive
 - Less messy
 - More definitive
 - No radiation

The Compliment



- Radiographs
 - Organ malpositioning
 - Foreign bodies
 - Calculi
 - Free air
 - General screening
- Ultrasound
 - Parenchymal disease
 - Small lesions
 - Guide aspiration procedures

Patient Issues

- Patient comfort
 - V-table or trough
 - Quiet room, without through traffic
 - Hospitalization and sedation

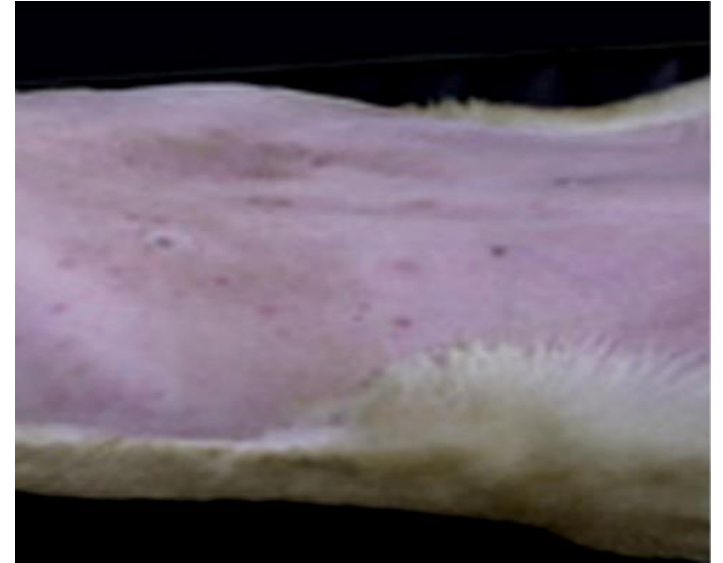
Removal of the Hair

- Clip from the xiphoid around the ridge of the costal arch and caudally to the inguinal area



Shaving Laterally

- It can be beneficial to shave the hair more dorsally on the right
 - Window for the liver
 - Deep chested or large dog

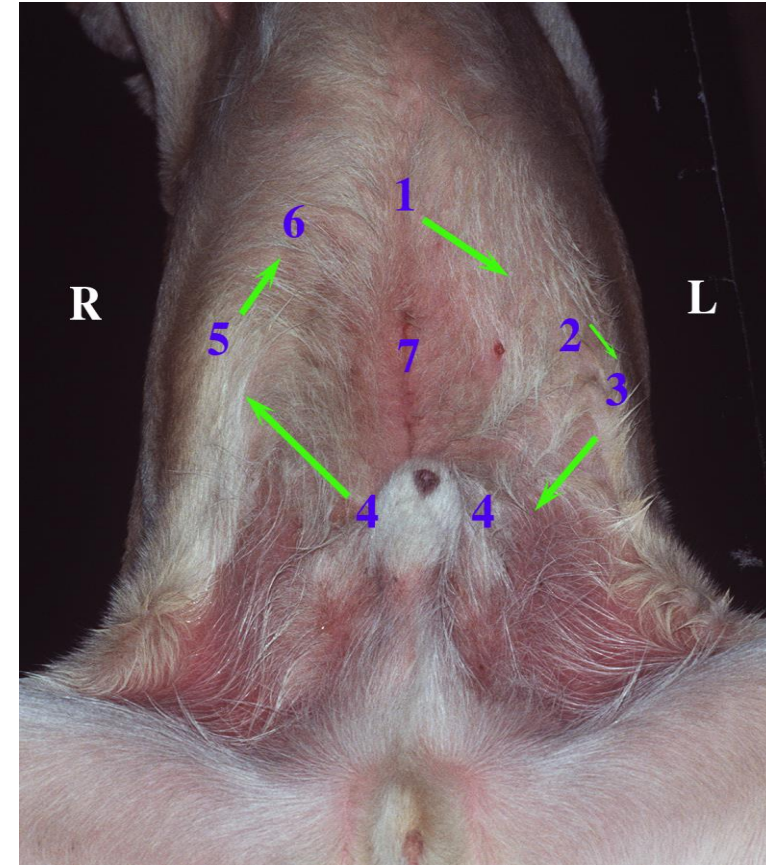


Coupling Agents

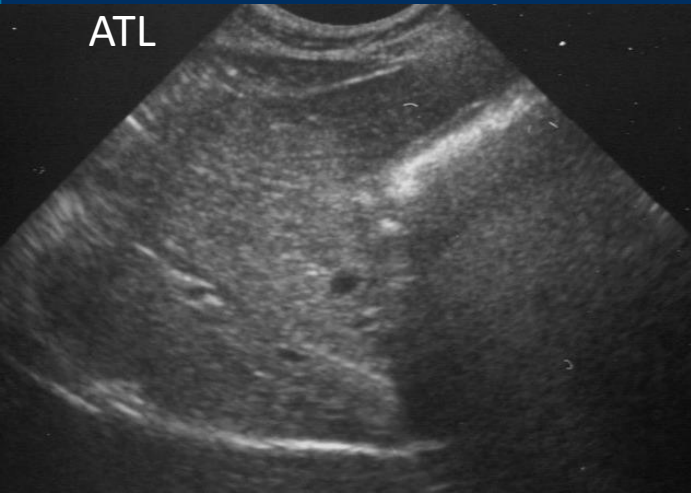
- Alcohol at 50 mixture will help cleanse the skin and displace gas in the hair follicles
- Apply liberal amounts of coupling gel

General Approach

- Clockwise trip around the abdomen
- Stay lateral to find most of the organs
- Requires regional scanning techniques



The Liver



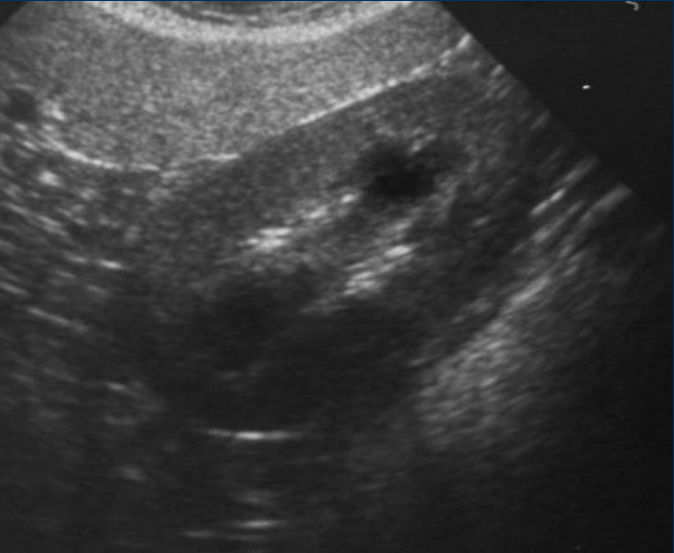
- Longitudinal Images
 - The gall bladder is on the right, angle toward the elbow.
 - The portal vein is to the right of midline.
 - The left lobes of the liver are cranial to the stomach.
- Transverse images give a global appreciation of the liver

Spleen



- The head of the spleen is very lateral and drops dorsally toward the spine
- The body and tail of the spleen are superficial therefore light pressure is needed

Left Kidney



- Use moderate hand pressure to 'pin' the kidney
- The kidney is located caudal to the head of the spleen
- If you are struggling to find it, it is probably more lateral than you are looking

Urinary Bladder



- Use both a fanning technique and a moving technique
- Always use two scan planes
- A fanning technique is needed to evaluate the bladder neck/urethra
- Reduce the depth of field and turn down the gain.

The Right Kidney

- Place the transducer against the last rib laterally
- Direct the beam cranially and lateral
- The kidney is often angled in a dorsal ventral plane

Descending Duodenum and the Pancreas

- Between the right kidney and the ventral body wall
- Usually is very superficial
- The initial landmark in the cat is the gall bladder
 - The pancreas is caudal to the gall bladder

Scan Down the Mid Abdomen

- Identify small intestine and look for lymph nodes
- Evaluation of the mesentery



Questions and Comments

