Imaging the Urogenital System

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Reading

- Thrall
  Chapters 42-46

Prostate Gland

- Not visible radiographically in normal dogs
  - Enlarges with age, especially if intact
- Causes for enlargement
  - Cysts
  - Infection
  - BPH
  - Cancer
MILD PROSTATOMEGALY

TRIANGULAR REGION OF FAT AIDS IN MAKING THE DIAGNOSIS

SOMETIMES SEE THE PROSTATE GLAND IN THE PELVIC CANAL ON THE VD
Radiographic evidence of mineralization

- Cancer
- Chronic prostatitis
- In castrated male
  - Cancer until proven otherwise

Mineralized prostate tumor with metastasis to medial iliac LN

Normal – Castrated

Enlarged - Castrated
Two circular soft tissue opacities in the caudal abdomen

Paraprostatic cyst

**Kidneys**

- Retroperitoneal Organs
  - Right kidney cranial to the left
  - Left kidney more variable in location.

- Size on VD
  - Dog: 2.5 – 3.5 x length of L2
  - Cat: 2.4 – 3.0 x length of L2

**Kidneys**

- Cranial pole of the right kidney
  - Difficult to see
  - Silhouettes with caudate lobe of liver

- With lack of fat
  - Difficult to see either kidney
Normal Cat

Mass Effect - Kidney
- Kidney masses
  - Ventral displacement of intestine
  - Especially colon
- A normal size kidney
  - Still can have disease

Bilateral renal enlargement
- Lymphoma
- FIP
- Hydronephrosis
Excretory Urography

- Improves morphologic assessment
- Poor test of function
- Iodinated water-soluble contrast medium
  - Blood flow
  - Glomerular filtration
  - Tubular reabsorption of water
**Excretory Urogram**

- Contrast medium
  - Ionic water soluble
  - Non-ionic if patient is compromised
- Contraindications
  - Azotemia + dehydration
  - Pheochromocytoma
  - Multiple myeloma
  - Prior allergic reactions to C.M.

**Excretory Urogram**

Standard Protocol

- Survey radiographs
- Inject contrast medium rapidly
  - 400mg Iodine per pound
  - Approximately 1 ml per pound
  - Usually do not exceed 50 ml
**Projections**

- Immediate VD radiograph
  - Vascular phase
- Lateral and VD radiographs at 5 minutes
  - Nephrogram and pyelogram phases
- Lat and VD radiographs at 20 and 40 min.
  - Urogram phase
**Urinary tract rupture**

- Bladder rupture
- Left ureter rupture
- Dilated left renal pelvis & proximal ureter

**Pyelonephritis**

- Blunt diverticulae
- Dilated pelvis

**Misshapen & Pyelonephritis**

- Hydronephrosis
Ultrasound of hydronephrosis

Vaginography

Technique

- General anesthesia
- Foley catheter placed inside labia
- Labia clamped to seal outlet
- Contrast medium infused
- Resistance will often be encountered
Normal Retrograde Vaginogram

Vagina

Vestibule

Urethra

Ectopic Ureters

Ectopic ureters

Vagina

Vestibule

Urethra

Urinary Bladder

- Easier to evaluate with ultrasound
- Very few radiographic urinary tract studies are performed
- If suspect bladder problem
  - Carefully consider relative merits
    - Radiography versus ultrasonography
Urinary Bladder

- To identify significant bladder problems in survey radiographs is unusual
  - Stones
  - Gas in wall; rare

Urethral Calculi

"BUTT SHOT" useful to assess entire urethra
**Emphysematous cystitis**

- Diabetes (glucosuria) with secondary bacterial infection

**Urinary Bladder**

- Contrast Examinations
  - Positive contrast cystogram
    - Put contrast medium in bladder
  - Negative contrast cystogram
    - Rarely used
    - Don’t use room air; use CO₂
  - Double contrast cystogram
    - Useful for mucosa assessment

**Cystography**
Urinary bladder masses

Urinary Bladder – Contrast

- Double Contrast Cystogram necessary to evaluate bladder mucosa.
- Assess:
  - Serosal margin
  - Mucosal margin
  - Bladder wall thickness
  - Luminal filling defects

Ultrasound is better
Positive contrast cystography
• Looking for rupture

Air Embolism
• More common in cats
• Especially those with hematuria

Air Embolism
• Air in C.V.C.
• Air around bladder neck

Air Embolism
• Air in R.V.
• Air in P.A.
What to do!

• Put animal in left lateral recumbency
• Elevate the tail
  – This makes the right ventricle the highest point
  – Traps air before getting to lungs

What not to do!

• Scream
• Panic
• Cry

Conclusion

• Normal radiograph of kidney
  – Not necessarily a normal kidney
• Contrast studies
  – Negative contrast cystogram
  – Positive contrast cystogram
  – Double contrast cystogram
  – Excretory urogram
• Ultrasound is slowly replacing these