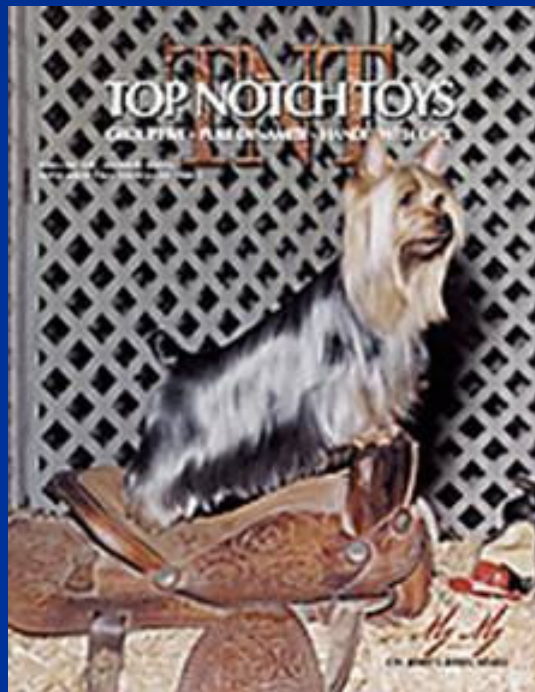


Challenging & Controversial Case Presentations in Small Animal Reproduction



The Bitch & Queen



Autumn Davidson DVM, MS, DACVIM

Tomas Baker MS



Small Animal Reproduction

- Actual cases
- Signalment, history, chief complaint, physical exam findings
- Problem list
- DDX & Diagnostic plan?
- Reproductive pathophysiology, reproduction ultrasound techniques
- Findings, therapy, outcome



Reproductive Cases

“Vampire”

- Sign 11y fs Labrador cross
- HX OVH 8y ago, myeloma (remission), no meds
- CC Serosanguinous vulvar discharge 3m
- PE discharge, mammary masses
- PL
 1. Abn VD
 2. Mammary masses
- DDX?
- P?



Reproductive Cases

“Vampire”

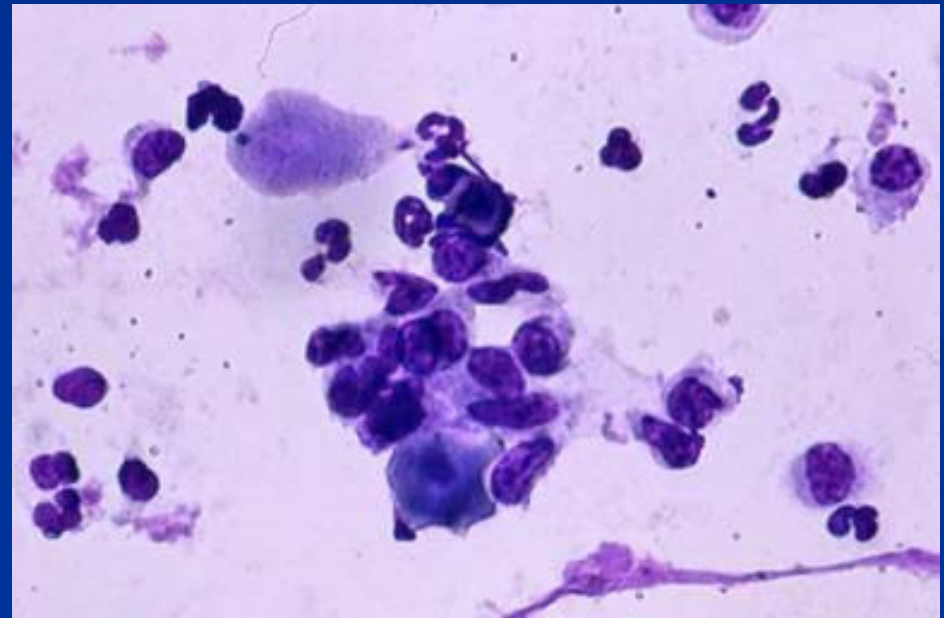
- DDX (discharge) UG inflammatory disease, fb, coagulopathy, anatomic defect, uterine stump granuloma vs ORS & uterine stump pyometra, UG neoplasia
- DDX (masses) mammary neoplasia, dysplasia, granuloma
- P MDB, vaginal cytology/culture, exudate cytology, serum P4, **US**



Reproductive Cases

“Vampire”

- L shift, neutrophilic leukocytosis, monocytosis
- Suppurative anestrus vaginal cytology
- Purulent exudate
- Vaginal E. coli
- P4 9.5 ng/mL
- **Ultrasound findings**



Female Ultrasound: Uterus

Scanning Technique:

- Transverse view
- Dorsal to bladder
- Ventral to colon
- Follow cranially to bifurcation



Uterine Ultrasound

Scanning Technique:

Uterus – having trouble?

- Use multiple scan planes
- Alter pressure
- Thicker wall than bowel

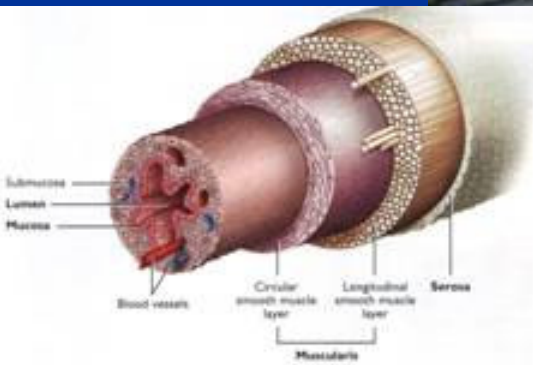
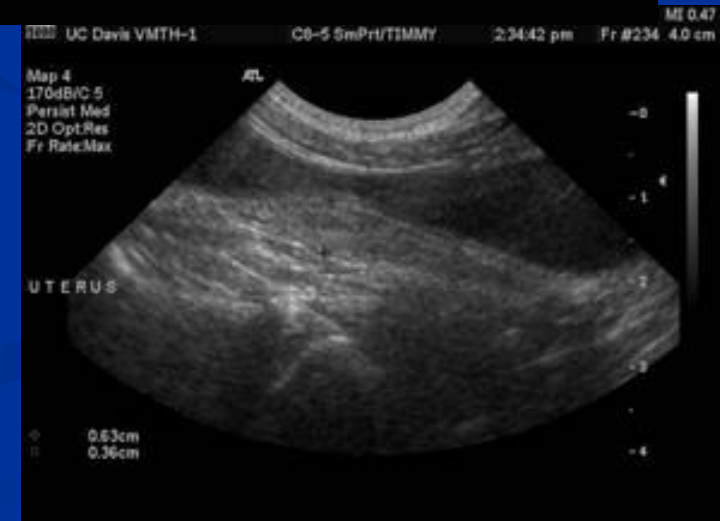
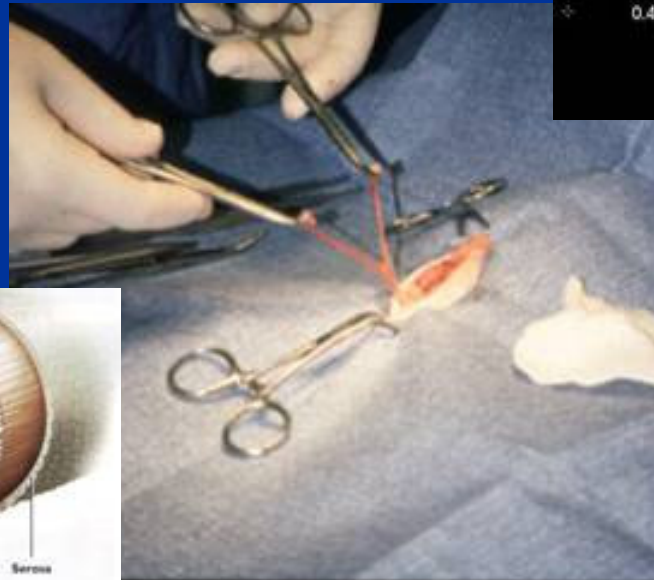


Uterine Ultrasound

Normal Findings

Well defined, tubular structure with layered walls

- Varies with **age/parity**
- Varies with **estrous cycle stages**



Uterine Stump Abnormalities

Signs



Ultrasound



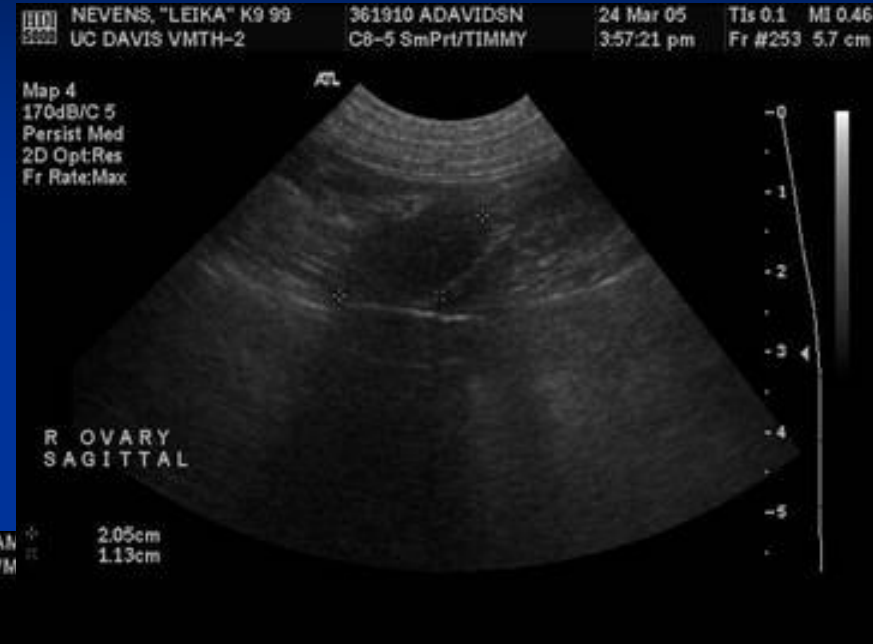
- Small complex mass effect between bladder and colon
- +/- Mineralization of suture material/foreign body



Female Ultrasound: Ovaries

Scanning Technique

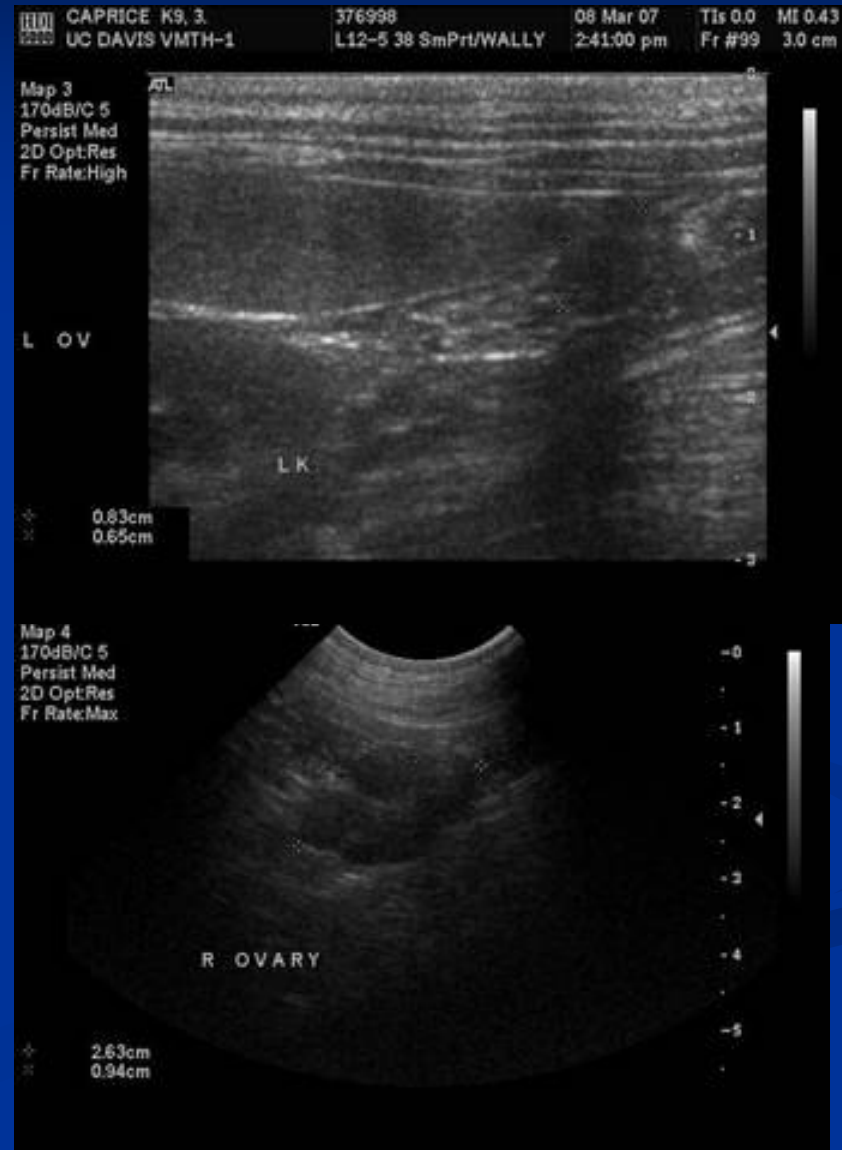
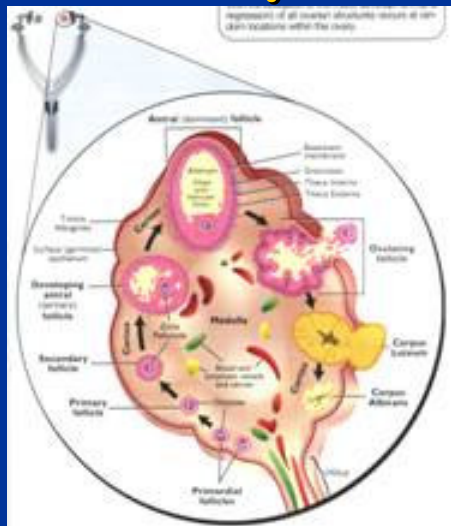
- Locate caudal pole of kidney
- Sagittal view
- Very superficial use light pressure
- Distal enhancement
- “Melon in hammock”



Ovarian Ultrasound

Normal Findings

- Oval to bean shape
- 0.5-1.5 cm diameter
- **Age related** changes
- **Ovarian cycle** changes



Abnormal Ovarian Ultrasound

Cystic Ovaries

Follicular cysts

Luteal cysts

Signs

- Persist > 30 days causing primarily **estrogen** effect (vaginal cytology)
- Medical (gnrh, HCG) vs surgical management?
- Fine needle aspirate?

Ultrasound

- Thin walled
- Anechoic contents
- 1-5 cm



Abnormal Ovarian Ultrasound

Cystic Ovaries

Follicular cysts

Luteal cysts

Signs

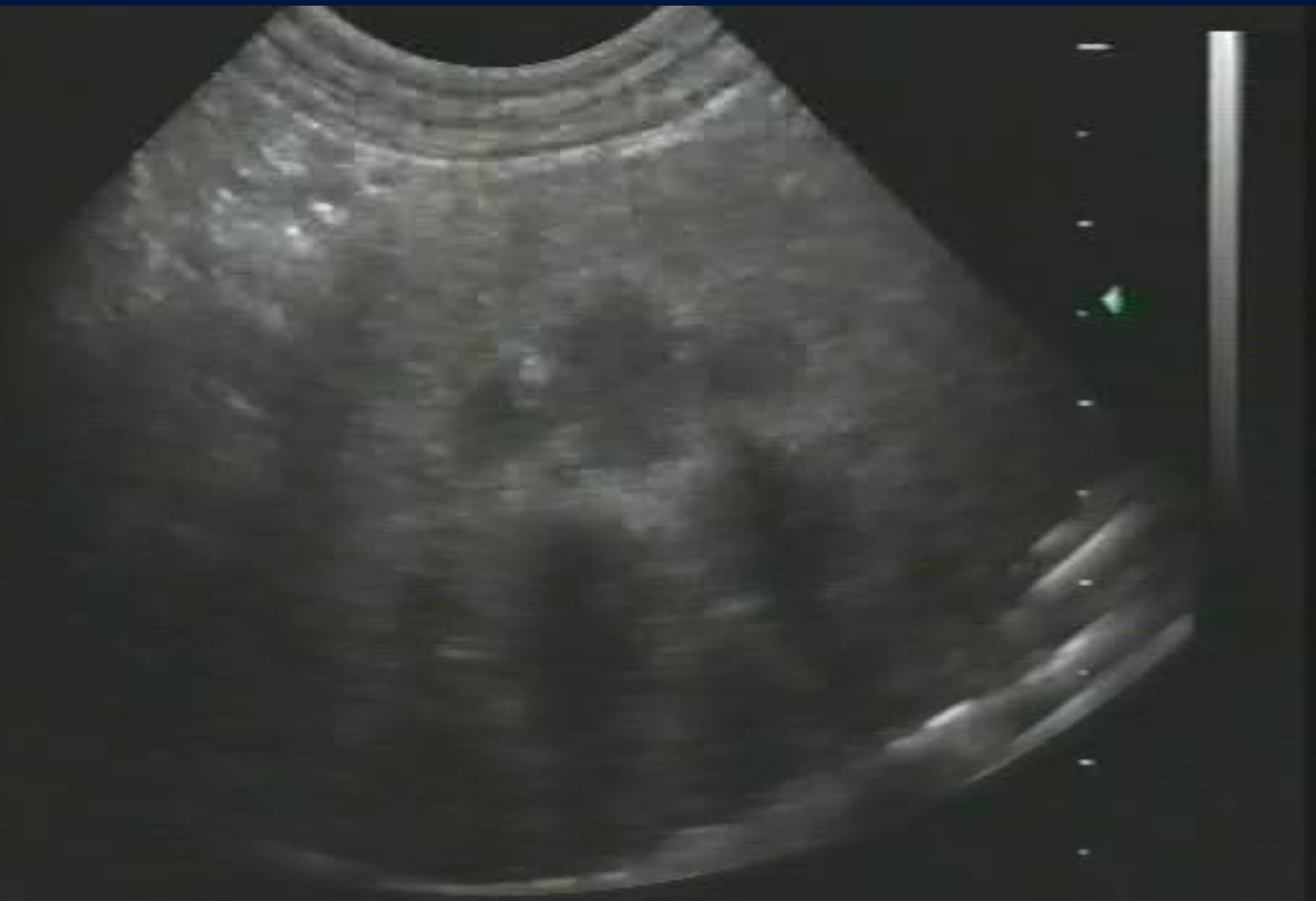
- Persist > 45 days causing primarily **progesterone** effect (hormone assay)
- Evaluate uterus for CEH/pyometra
- Medical (pgf2alpha) vs surgical management?

Ultrasound

- Thicker walled
- More echogenic contents
- 1-5 cm diameter



DynRg 55dB
Persist Med
Fr Rate Med



Ultrasound: Ovarian Neoplasia

SIGNS

ULTRASOUND

- Complex irregular masses
- May be cystic with ascites
- Evaluate mesentery for carcinomatosis
- Diagnosis by exclusion (find your friends)

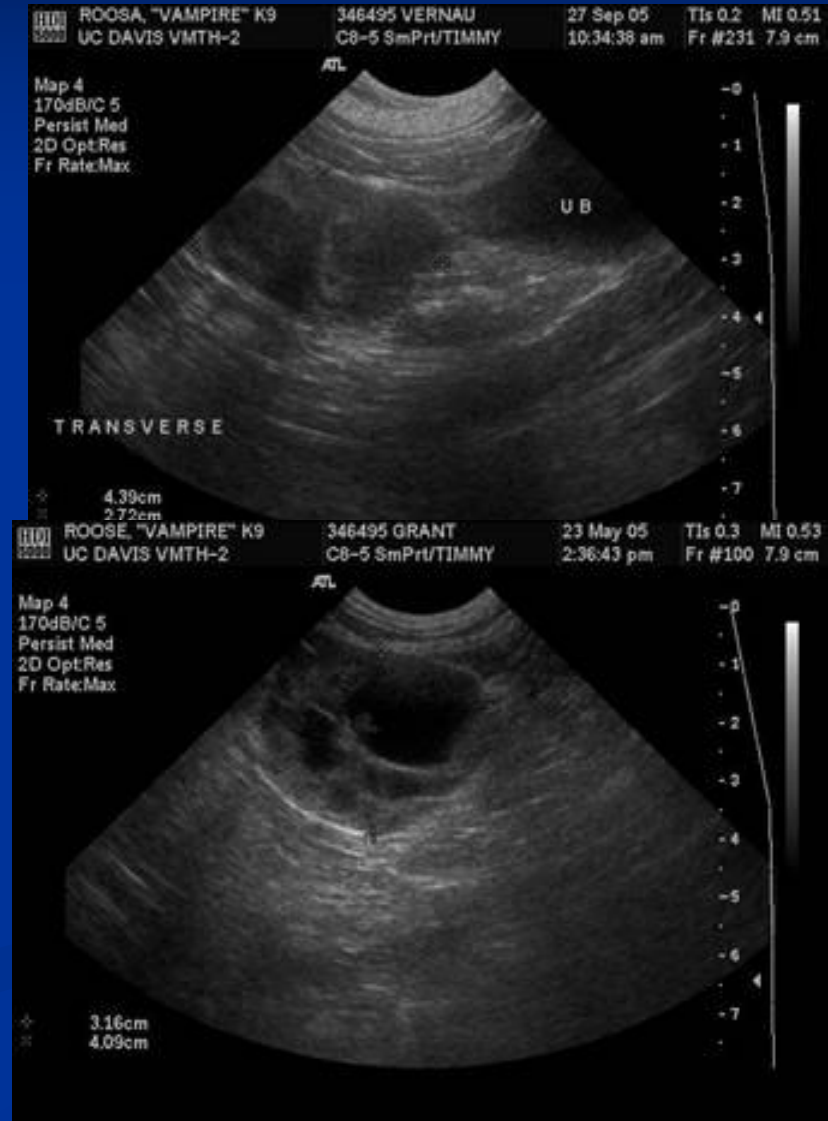


Reproductive Cases

“Vampire”

Ultrasound Findings

- Large cystic mass dorsal to urinary bladder (uterine stump)
- Multilobulated cystic mass caudo-lateral to R kidney (ovarian remnant)



Reproductive Cases

“Vampire”

DX Ovarian and uterine remnants

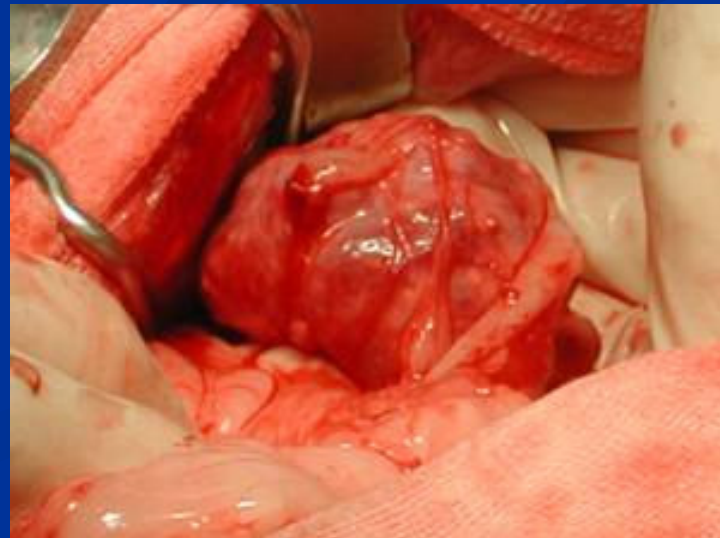
TX Laparotomy

- Revision of uterine stump
- Excision of ovarian remnant
- Mammary mass removal

Histopathology

- Stump pyometra
- Ovarian luteoma
- Mammary adenomas

Outcome: Full recovery



Reproductive Cases

“Leika”

- Sign 5y f Doberman
- HX Whelped 14w ago; 4/10 stillborn fetuses
- CC Vulvar discharge (blood) since
- PE: Sparse, dry hair coat, hemorrhagic vulvar discharge, lactating
- PL
 1. Hx stillbirths
 2. Persistent vulvar discharge
 3. Poor hair coat
 4. Mammary development
- DDX?
- P?

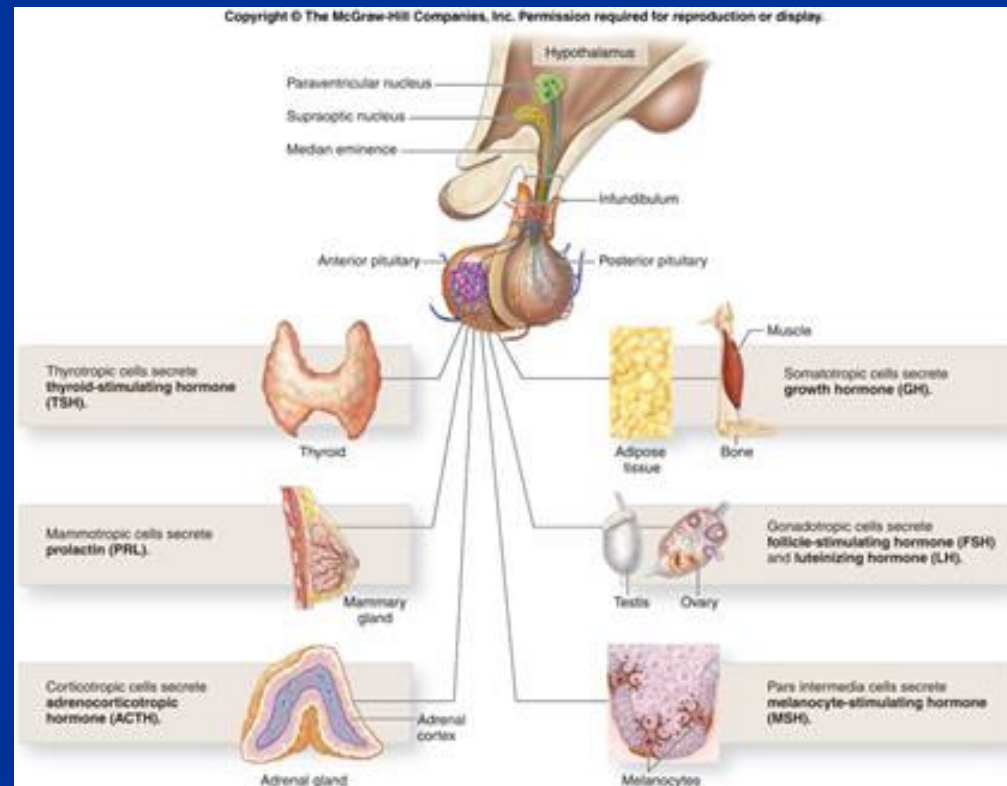


Reproductive Cases

“Leika”



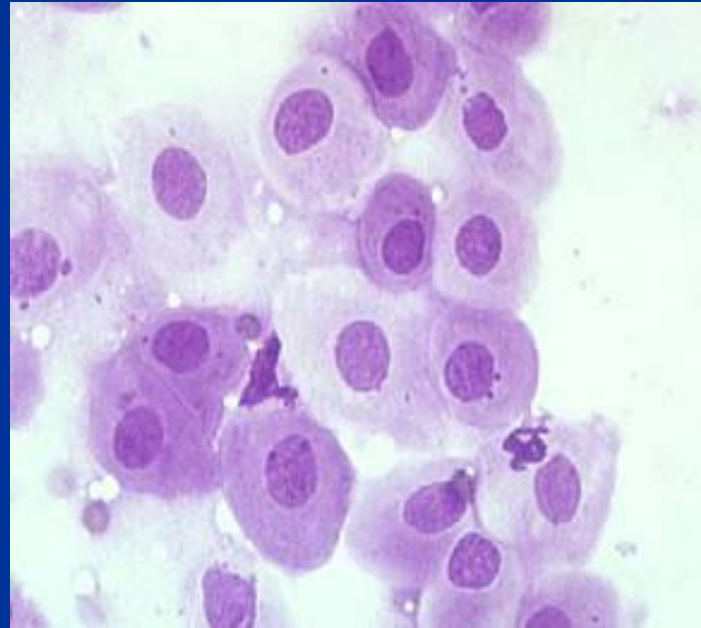
- DDX (discharge) subinvolution of placental sites (SIPS), metritis, coagulopathy
- DDX (stillbirths) dystocia, metritis, placentitis, fetal defects, infectious disease
- DDX (PE) hypothyroidism
- P MDB, vaginal and discharge cytology, P4, B. canis, thyroid panel, VW evaluation, **US**



Reproductive Cases

“Leika”

- Anestrus
- P4 0.5ng/mL
- TT4 <0.3ug/dL (1-3.6),
fT4ed <0.15 (0.8-3.5), TSH
1.2 (0-0.6), TGAA positive
- Cholesterol 441
- Normal VW
- **Ultrasound findings**



Female Ultrasound Normal Post Partum

- Serial evaluation best
- Ultrasonographic involution precedes histologic (16 weeks)
- Sites of placental attachment $< 1.0-1.5$ cm by 21 days post partum (k9)
- Fluid present normally for only 7-10 days



Abnormal Post Partum Subinvolution of Placental Sites (SIPS)/Metritis

- *Signs*
- *Ultrasound*
- Fluid accumulation, echogenic debris > 21 days abnormal
- R/O subinvolution (SIPS) vs metritis clinically



Uterine Ultrasound: Neoplasia

Signs

Ultrasound

- Complex, irregular Appearance of body or horn



Reproductive Cases

“Leika”

Ultrasound Findings

- Involuting uterus
- Normal ovaries



Reproductive Cases

“Leika”

DX: Hypothyroid

TX

- L-thyroxine 0.8 mg po bid
- Normalization of hair coat
- Vulvar discharge resolved
- Normal post pill TT4 (2.2),
cTSH (<.03) one month
later

Outcome

- Successful whelp 8 months
later (11 pups)



Reproductive Cases

“Phoebe”

- Sign 1.5y f French bulldog
 - HX Second cycle
 - CC Signs of heat for 12w
 - PE Vulvar swelling, sanguinous discharge, flagging
 - PL
1. Abnormal estrous cycle
- DDX?
 - P?



Reproductive Cases

“Phoebe”

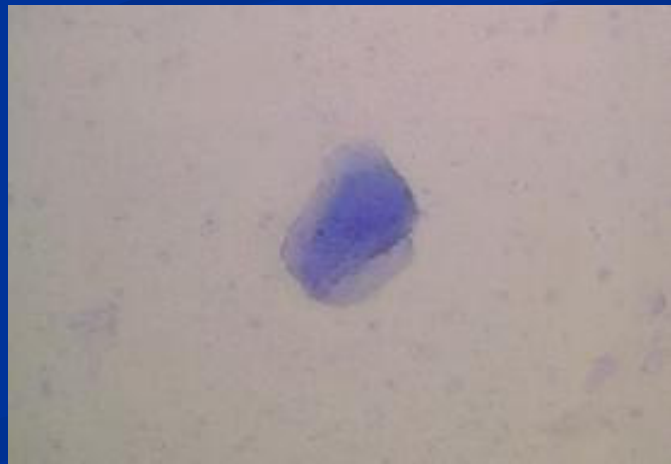
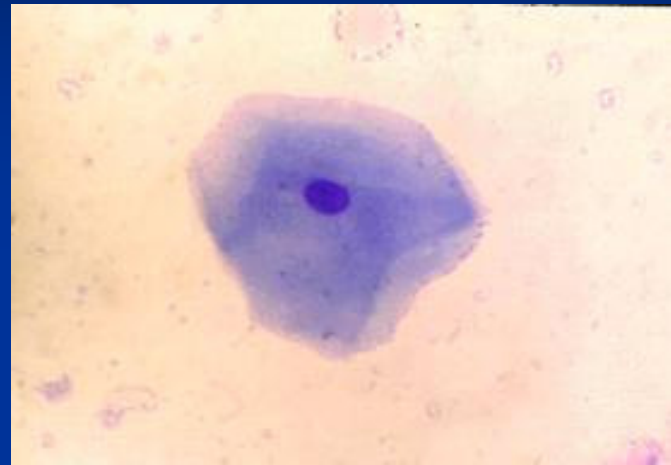
- DDX (cycle) ovarian follicular cyst, functional ovarian neoplasia, iatrogenic, GU inflammation/fb, coagulopathy, GU neoplasia, hepatopathy
- P MDB, serum E/P4, vaginal cytology, **US**



Reproductive Cases

“Phoebe”

- Proestrus/estrus
- Serum E 23 pg/mL (15-45+)
- P4 0.1 ng/mL (<1)
- **Ultrasound findings**

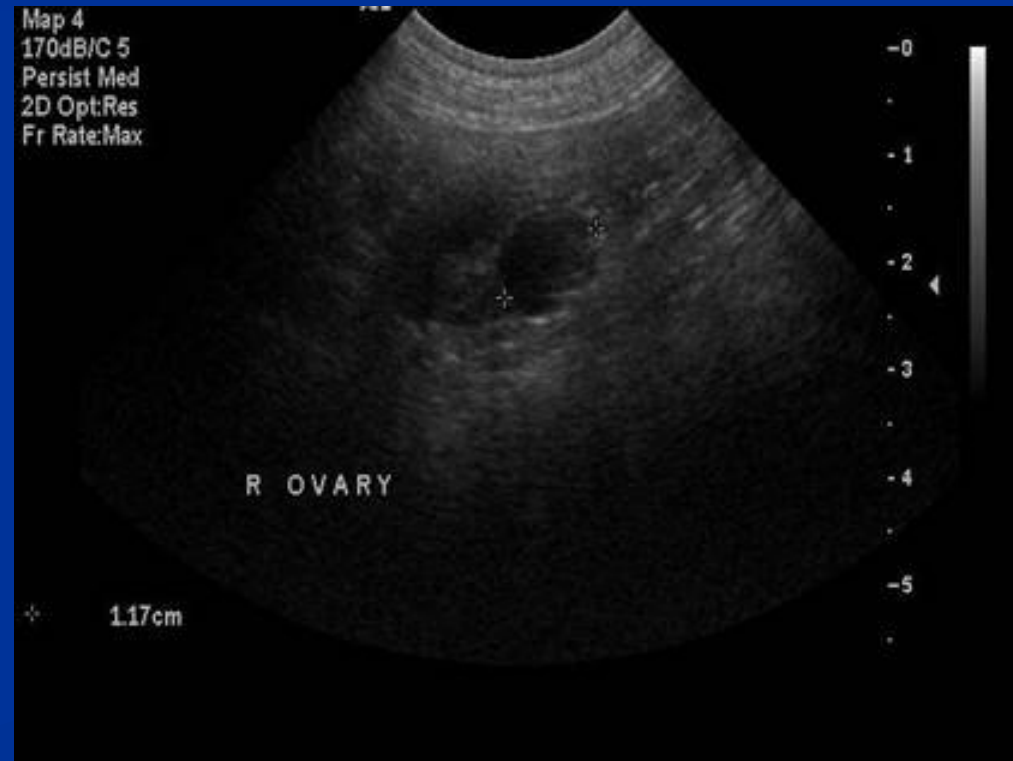


Reproductive Cases

“Phoebe”

Ultrasound Findings

- Thickened uterine wall, fluid in lumen
- Cystic structure right ovary (thin wall)
- FNA cyst → elevated estradiol level >250 pg/mL.



Reproductive Cases

“Phoebe”

DX Ovarian follicular cyst

TX

- Unilateral ovariectomy
- Post op (1 wk) E
0.1 pg/ml
- Histopathology
 - Follicular ovarian cyst
 - Ovarian atrophy
 - Hyperplastic oviduct and fimbria

Outcome: normal cycle, normal ultrasound, but failed to conceive 4 months later.



Reproductive Cases

“Maggie”

- Sign 3y f Labrador retriever
- HX 45 days gestation, multiparous
- CC Brown vulvar discharge
- PE Gravid, lochia, thin body condition, superficial vein prominence
- PL
 1. Abnormal vulvar discharge
 2. Poor body condition
 3. Venous prominence
- DDX?
- P?



Reproductive Cases

“Maggie”

- DDX (discharge)
Metritis, abortion,
coagulopathy
- DDX (veins) venous
stasis, thrombus
- P MDB, coagulation
profile, D-dimer, **US**



Reproductive Cases

“Maggie”

- Klebsiella UTI
- Positive fecal Giardia
- Hypoalbuminemia
- D dimer > 1000
- **Ultrasound findings**



Female Ultrasound: Fetal Death

Early gestation

- Static size of gestational sac
- Loss of gestational sac fluid
- No heart rate
- Loss of placental organization

Late gestation

- Intrafetal gas
- Intrauterine gas
- Loss of heart rate
- Fetal skull plates compression
- Flocculent chorioallantoic sac fluid



Ultrasound: Fetal Death

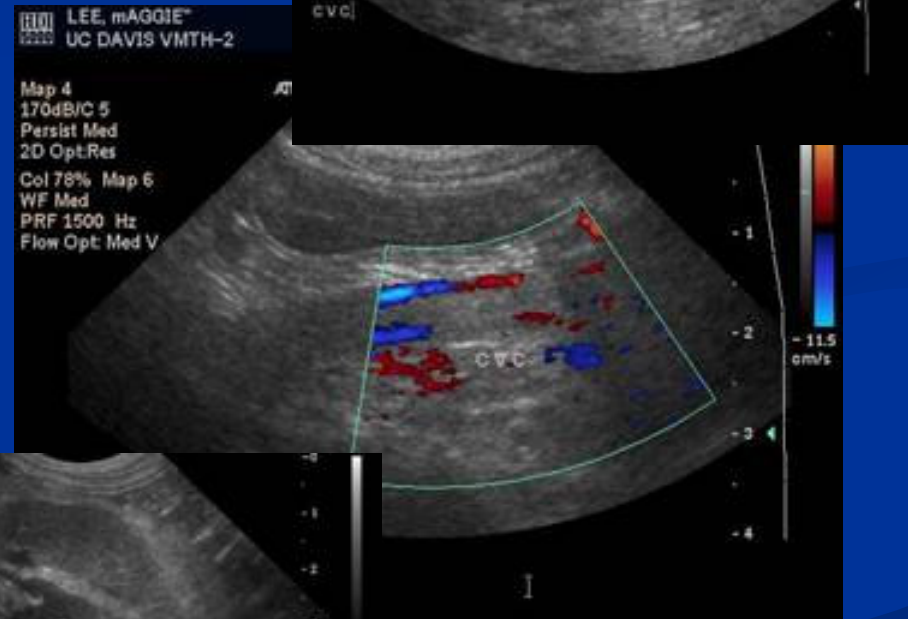


Reproductive Cases

“Maggie”

Ultrasound Findings

- Multiple non-viable fetuses
- Complete thrombosis of the left and right femoral v, partial of lateral and medial saphenous v
- Right pyelectasia, right hydroureter
- Sublumbar lymphadenopathy



Reproductive Cases

“Maggie”

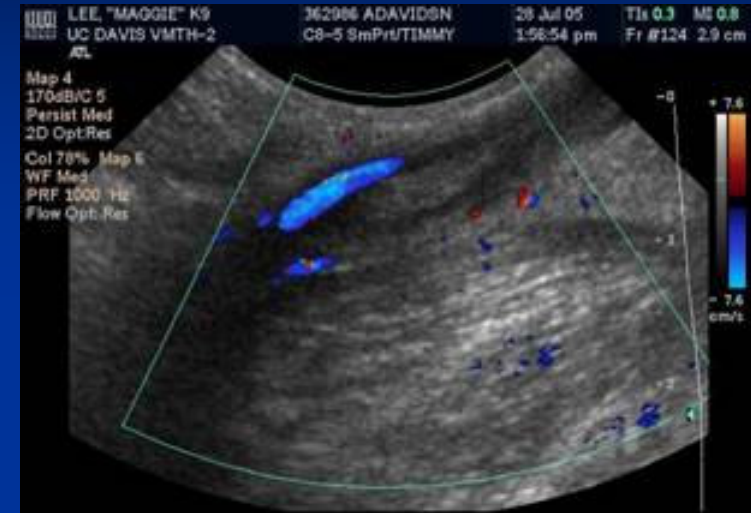
DX: Prothrombotic, abortion, UTI

TX: OVH, cephalixin, aspirin post op

Outcome

Ultrasound Findings (1, 3, 32 weeks)

- Partial recannulation of thrombosed veins
- Reduction in size of uterine stump
- Persistent hydroureter/pyelectasia at 3 weeks, resolved by 32 weeks.



Reproductive Cases

“Maggie”

Outcome

- Negative urine cultures
- Pelvic limb venous prominence resolved at 32 weeks.



Reproductive CASES

“Hotsy”

Sign 3y f Labrador Retriever

HX Multiparous, pyometra,
OVH two weeks ago

(ultrasound diagnosis)

CC Hemorrhagic vulvar
discharge since

PE Blood clot at vulva

PL

1. Post OVH hemorrhagic
vulvar discharge

DDX?

P?



Reproductive Cases

“Hotsy”

DDX (discharge)

Coagulopathy, post operative complication, ovarian remnant syndrome, GU inflammatory or neoplastic disease

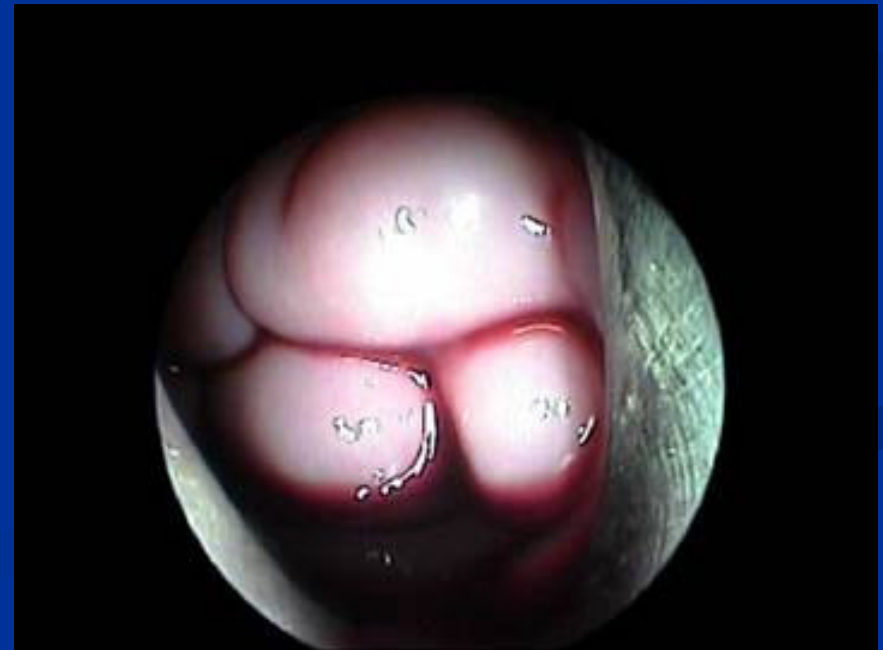
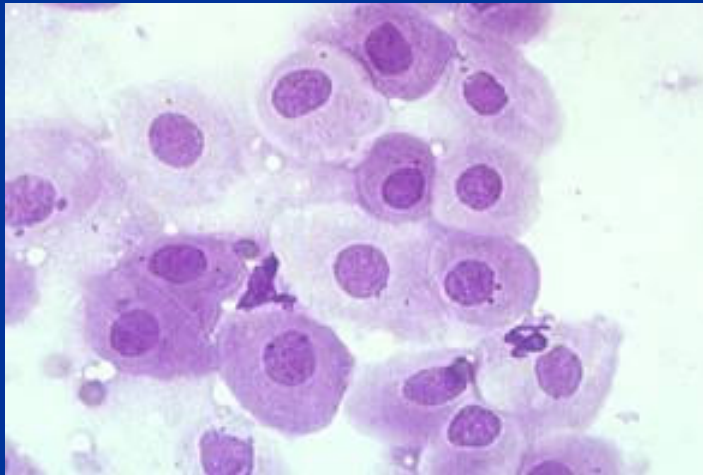
P MDB, coagulation profile, BMBT, vaginoscopy, vaginal cytology, **US**



Reproductive Cases

“Hotsy”

- ❑ Blood in vaginal vault
- ❑ Anestrus cytology
- ❑ Normal coagulation tests
- ❑ **Ultrasound findings**



Uterine Ultrasound

Cystic Endometrial Hyperplasia (CEH)

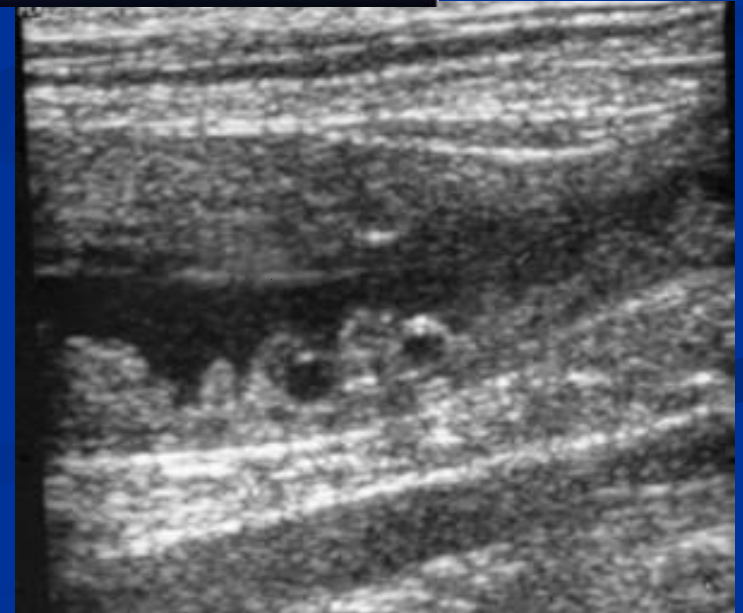
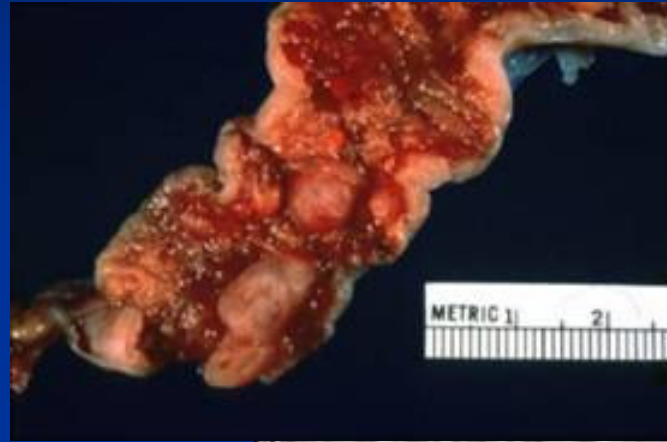
CEH

Signs

Ultrasound

Tubular structure

- Thickened wall
- Variably sized endometrial cystic structures
- Thin layer of luminal fluid



Uterine Ultrasound

CEH → Hydrometra/Mucometra



CEH → Hydrometra or Mucometra

Signs

Ultrasound

- Tubular structure
- Anechoic to hypoechoic luminal fluid
- +/- Thickened walls



Uterine Ultrasound

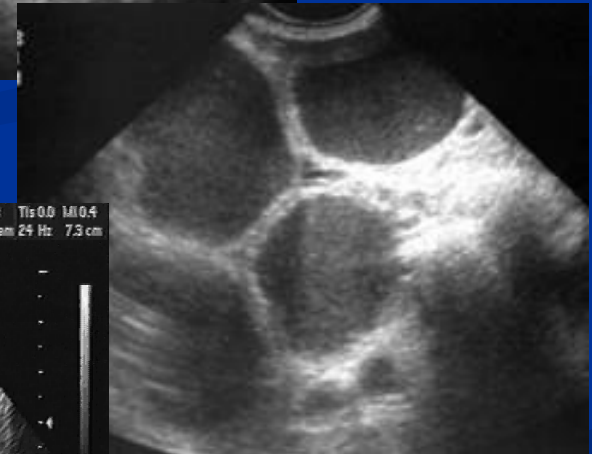
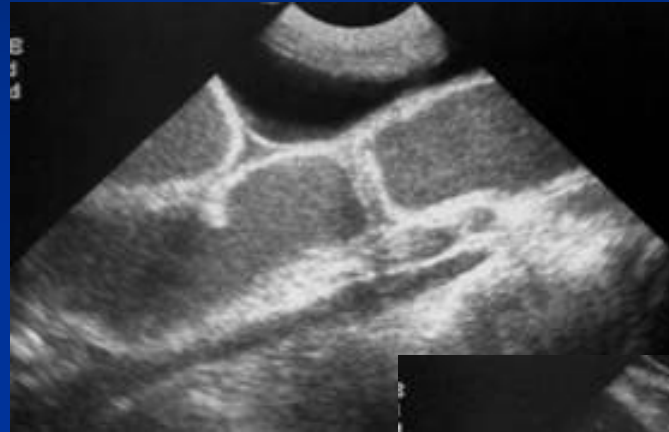
CEH → Pyometra

CEH → Pyometra

Signs

Ultrasound

- Tubular structure 1-6 cm diameter
- Echogenic (flocculent) luminal fluid (open vs closed)
- Convoluted, stacked horns
- Thickened walls
- No peristalsis or gas
- +/- Ascites



Map 3
170dB/C 5
Persist Med
2D Opt:Res
Fr Rate:Max

BW 2 Pg 0
Col 0 Pg 0

UTERUS

-0
.
-1
.
-2
.
-3
.
-4
.
-5
.



Reproductive Cases

“Hotsy”

Ultrasound Findings

- ❑ No abdominal effusion
- ❑ Complex, echogenic masses at uterine stump and ovarian pedicles

DX: Surgical complication

TX: Exploratory

- Adhesions and granulomas at sites of ligations
- Loose ligatures
- Religated

Outcome: full recovery



Reproductive Cases

“Minnie”

Sign 1.5y f Great Dane

HX OVH 14d ago

CC Lethargic

PE Pale mm, abdominal
distension

PL

1. Anemia
2. Possible hemoabdomen

DDX?

P?



Reproductive Cases

“Minnie”

DDX (hemoabdomen)

Coagulopathy vs post
operative complication vs
GU inflammatory or
visceral neoplastic disease

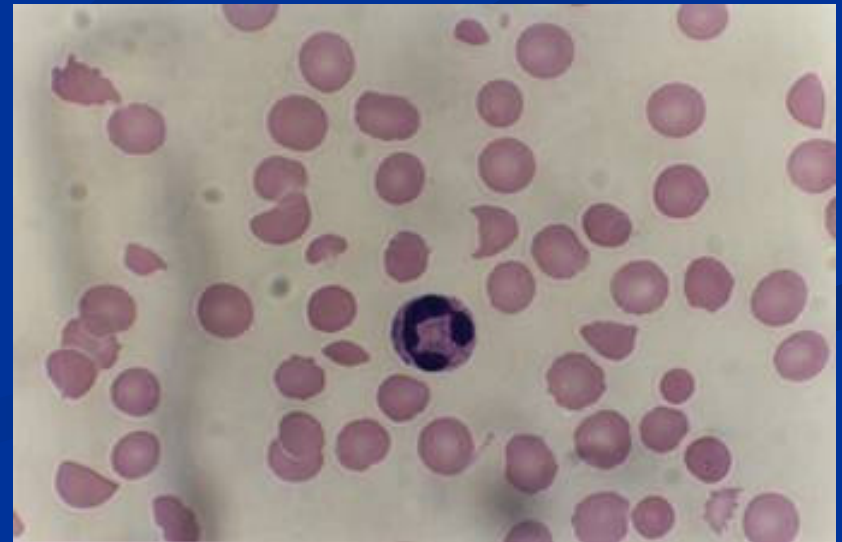
P MDB, coagulation profile,
BMBT, **US**



Reproductive Cases

“Minnie”

- PCV 23% TP 4.0
- Abdominal PCV 68% TP 4.5
- Prolonged BMBT
- PC 64,000, n PT, p PTT
- vWf submitted
- **Ultrasound findings**



Reproductive Cases

“Minnie”

ULTRASOUND FINDINGS

- Abdominal effusion (characteristics of blood)
- Complex masses at uterine stump and ovarian pedicle sites

OUTCOME

- DX Coagulopathy (VW)
- Euthanasia elected



Reproductive Cases

“Shelly”

Sign 12y fs Norwegian Elkhound

HX OVH 8y previously, vulvar hemorrhagic discharge 4m, attractive to males

CC Vulvar discharge

PE Purulent to hemorrhagic vulvar discharge, abnormal urethra rectally, moderate dental calculus, halitosis

PL

1. Purulent vulvar discharge
2. Thickened urethra
3. Periodontal disease

DDX?

P?



REPRODUCTIVE CASES

“Shelly”

DDX (discharge)

Uterine stump
granuloma/pyometra (ORS),
GU inflammatory or neoplastic
disorder

DDX (urethra)

Inflammatory or infiltrative
disease of the UG tract

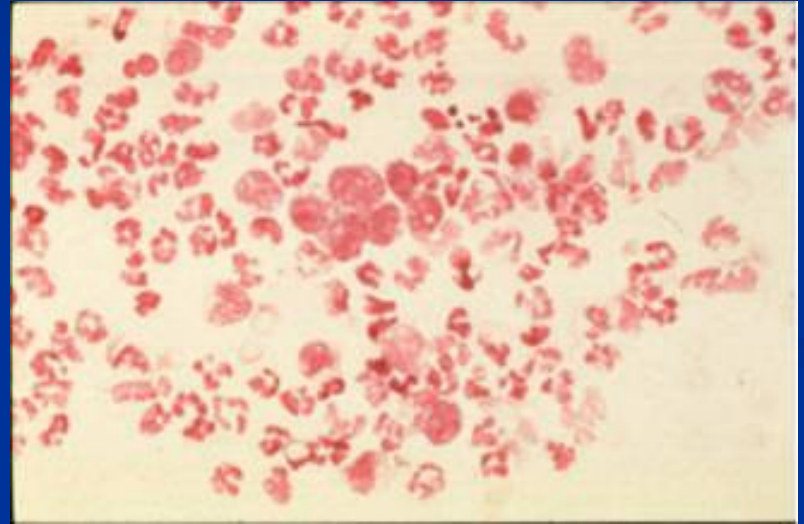
P MDB, thoracic radiographs,
vagoscopy, vaginal and
exudative cytology, **US**



Reproductive Cases

“Shelly”

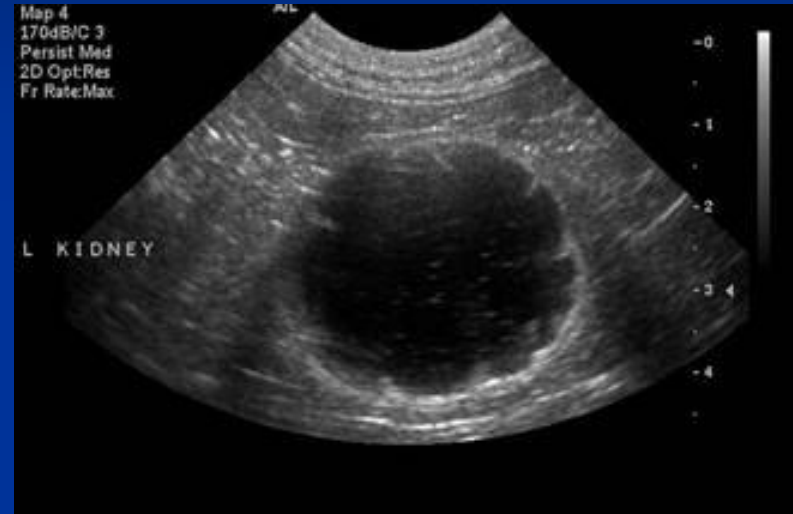
- E. coli UTI
- Suppurative vulvar discharge
- No estrogen influence
- Urine SG 1.009
- **Ultrasound findings**



Reproductive Cases

“Shelly”

- **Ultrasound Findings**
 - Left hydronephrosis
 - Enlarged uterine stump (2.81x1.94)



REPRODUCTIVE CASES

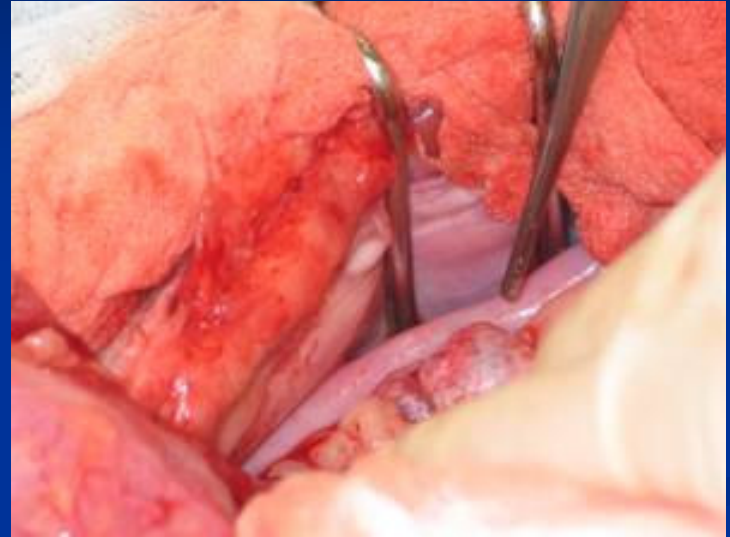
“Shelly”

DX: Hydroureter, pyelonephritis, uterine stump disorder, mass at ovarian site

TX: Exploratory laparotomy, nephrectomy, resection OR, biopsies

OUTCOME

- Clinical resolution
- Histopathology:
 - Uterine stump pyometra
 - Severe L hydronephrosis and hydroureter secondary to ligation of distal ureter
 - Ovarian remnant, CLs



Reproductive Cases

“Minerva”

Sign 1y fs DSH

HX OVH 10m previously

CC Vocalizing 10w

PE Unremarkable

PL

1. Estrus behavior in
“spayed” cat

DDX?

P?



Reproductive Cases

“Minerva”

DDX (cycling) ORS

DDX (kidney) aplasia,
atrophy, hypoplasia, ??

P Vaginal cytology, MDB, **US**



Reproductive Cases

“Minerva”

- Vaginal cytology indicated estrogen influence



Ultrasound Findings

- Oval structure right mid ventral abdomen (multiple hypoechoic nodules)
- No right kidney



Reproductive Cases

“Minerva”

DX ORS

- Exploratory laparotomy, removal of remnant right ovary, no right kidney found
- Histopathology: functional ovary, multiple corpora lutea

OUTCOME

- Resolution of signs



Questions? ~ Thank you

