Reproductive Medicine & Surgery in Exotic Companion Mammals

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“Dr. Google”
Objectives:

- Rabbits, guinea pigs & other rodents, ferrets
- Male and female
- Brief practical anatomy
- Alternate approaches to “spays and neuters”
- Reproductive diseases
- “Recent study evaluating diseases in GPs, problems with the genital system 3rd most common reason for presentation to the vet”
References:
Sex & Gender

- **Sex** - Your assigned gender at birth and/or the gender of your reproductive organs
- **Gender** - Where you feel that you personally fall on the spectrum between male & female, some fall in the middle or move throughout the spectrum
- **Cisgender** - When you identify with the gender you were assigned at birth
- **Transgender** - When you identify with a gender different than that you were assigned at birth
- **Transsexual** - When you have had Gender Reassignment Surgery (GRS) to change the sexual organs you were born with to that of a different gender
Importance: Time and $

- Neuter ~15 min, no IVC
- Spay ~45 min
- Anesthetic risk
Surgical Sterilization of Exotic Pets: Risk-Benefit to Procedures (Welle 2018)

Birds
- Surgery only when absolutely necessary

Reptiles
- Surgery when disease is present

Ferrets
- Deslorelin implants instead of surgery

Rabbits
- Spay/Neuter before 1 y of age

Guinea pigs
- Ovariectomy if necessary; castrate if keeping males with other guinea pigs

Chinchillas
- Spay or castrate only if necessary

Rats
- Spay or castrate if necessary

Sugar gliders
- Neuter males
• Rabbits: testes anterior to penis
• Move freely to the abdomen through an open inguinal canal
• Inguinal canal in rabbits & rodents remains open throughout life
• No true scrotum, 2 scrotal sacs
• Contains testes, epididymis, caudal spermatic cord
• Accessory glands: prostate, coagulating, seminal vesicles & bulbourethral
• Despite the relatively large size of the inguinal canal, scrotal hernias are uncommon
Orchiectomy

- Prevention of breeding
- Behavioral causes: sexual, urine-marking, and territorial behaviors
- Tx pathology: tumors, infections, trauma, cryptorchidism
- Management of sex hormone-related diseases such as hamartoma (benign)
- It is believed that castration increases the risk of abdominal content herniation through this open inguinal canal
- 3 approaches: scrotal, prescrotal and an abdominal
- Generally recommended to close the inguinal ring during the surgical procedure to prevent subsequent prolapse of abdominal contents???
- Can be performed using either an open or a closed surgical technique
#13 pet rabbits, 4 m to 2 y
Considered clinically healthy based on a complete PE
Mixed breed pet rabbits
Midazolam 0.2 mg/kg and morphine 2 mg/kg IM
4% Isoflurane in induction chamber > face mask 3%
Lidocaine 2 mg/kg & bupivacaine 1 mg/kg
Injected 1/2 intrascrotally & 1/2 in the site of cutaneous incision
Scrotal vs. Prescrotal

- Buprenorphine 0.05 mg/kg IM 2h post op
- Meloxicam 0.5 mg/kg SC post op & 24 h later
- Syringe-fed 20 mL/kg Herbivore Critical Care at 4, 8, 24 & 32 h after surgery
- Discharged without medications 32 h after recovery
- Reexamined 5 to 7 d post op
Scrotal vs. Prescrotal

• Significant increase anesthesia time 20.6 m vs. 17.9 m
• Scrotal significantly higher degree of edema
• No infections or inguinal hernias were noted
• Licking with incisional dehiscence, 2 rabbits scrotal group
• Prescrotal group also experienced less postoperative swelling
• External sutures, no histopath
- Usually don’t shave or pluck
- Block skin and testes
- Closed, proximal scrotal or prescrotal
- Ample saline to dissect all the way trough vaginal tunic
- Peels nicely off testes, less trauma
- Double ligature, monofilament and lavage site
- +/- glue skin
Step by step Prescrotal
Open technique
Urinary obstruction due to a prostatic abscess in a young neutered rabbit (Lempert 2019)

- 2y M(C) rabbit hematuria & lethargy
- PE: lower urinary tract obstruction
- T 104.4°F, tachycardia 320 BPM, tachypnea 300 RPM
- US: enlarged prostate compressing the urethra
- US-guided aspiration > suppurative inflammation & intracellular bacteria consistent with a prostatic abscess
- C/S: P. multocida
- Tx: Urinary catheterization to decompress the bladder, ultrasound-guided percutaneous drainage of the abscess
Urinary obstruction due to a prostatic abscess in a young neutered rabbit (Lempert 2019)

- US 7d post aspiration 54% decrease in width and 38% in length
- Basophilic staining extracellular coccobacilli surrounded by degenerate heterophils in a proteinaceous background
- Enrofloxacin, Prazosin & Bethanecol
- Passed 7 days after, no necropsy
Male guinea pig reproductive facts

- Hystricomorph rodents have a prescrotal sac vs. a true scrotum
- Open inguinal canal enables testes to be intra-abdominal, inguinal or in the prescrotal sac
- Prominent testes are located bilaterally of the anus in connection with a large fat body
- Penis is stabilized by an os penis, which is situated dorsal to their urethra
- Glans penis is spiculated (with little spikes on the surface) ventrally
- Sebaceous glands are found bilaterally in the fold of perineal skin located next to the penis
Male facts

• “Boars” have lateral scrotal swellings on each side of the anus
• Accessory glands: prostate, coagulating, seminal vesicles & bulbourethral
• Paired seminal v. sacs filled with semi-solid seminal secretions in caudal peritoneal cavity, dorsal to the bladder, extend 10 cm into the abdomen
• The seminal vesicles maybe confused with the uterus

Stones in seminal vesicles
Orchiectomy

- Similar to others
- It is believed that castration increases the risk of abdominal content herniation through this open inguinal canal
- 3 approaches: “scrotal, prescrotal” and an abdominal
- Generally recommended to close the inguinal ring during the surgical procedure to prevent subsequent prolapse of abdominal contents???
- Ligate the vaginal process, which passes through the inguinal canal
- Either an open or a closed surgical technique
• 7 Testicular A & V
• 8/9 Mesorchium
• 10 Lig tail epididymus
• 11 Scrotal sac
• 15 Fat body
• 25 Ductus deferens

• 11 Ductus deferens
• 12 Testicular A & V
• 13 Pampiniform plexus
• 17 Ductus deferens A & V
• 18 Fat body
To neuter or not to neuter?

• Mammary neoplasia/mastitis
• Testicular neoplasia
• Prepucial plugs and cloacal build up
• Sx: Scrotal > vaginal tunic, abdominal
Comparative study of 2 surgical techniques for castration of guinea pigs (Guilmette 2015)

- Compare 2 surgical approaches
- Investigate post-operative infection rates
- #48 were castrated by scrotal or abdominal technique after being randomly assigned to 1 of 2 groups (24)
- Castrated by an experienced exotic animal surgeon (12) or by an experienced small animal surgeon (12)
- Surgical wounds were evaluated daily before euthanasia and histological evaluation 2w post op
Scrotal vs. Abdominal

Anesthesia:
• Food was withheld for 2-4 h before surgery
• Midazolam 0.5 mg/kg, Hydro 0.1 mg/kg, Glycopyrrolate 0.01 mg/kg IM
• Anesthesia isoflurane facemask
• Lidocaine 1 mg/kg and bupivacaine 1 mg/k intra scrotal and SC site

Surgery:
• Scrotal: Individual scrotal incisions closed technique
• Abdominal: Mid line incision
• Proximal part of the testicular cord was double-clamped and ligated using 3-0 PDS
• Skin was closed using an intradermic SC 4-0 Monocryl
• Surgical tissue adhesive prn, wounds were sprayed with a permeable spray-on dressing (Opsite)
Scrotal vs. Abdominal

- Post-operative infection rate was significantly higher in the scrotal
- Higher rate for the experienced small animal surgeon
- Abdominal technique significantly faster and lower post-operative infection rate than the scrotal technique
- No external sutures, histopath
Male reproductive diseases: urethral plugs

- Normal finding, presence is correlated with good health
- Composed of proteins excreted by the seminal vesicles mixed with vesiculase from the coagulating glands
- If retro-ejaculation occurs plugs can be in the urinary bladder
- Not be mistaken with uroliths
- Can cause a urethral obstruction, dysuria and stranguria
- Orchidectomy is recommended >3m
- Causes an involution of the penis and the male accessory sex glands along with a decrease in the size of the urethral plug, eliminating the risk of an obstruction
Diseases of the Testicles: Orchitis and epididymitis

- *Streptococcus pneumoniae* can cause orchitis in rats
- Other lesions include fibrinopurulent bronchopneumonia, pleuritic, pericarditis, peritonitis, and meningitis
Diseases of the Testicles: neoplasia

- Most common reproductive tumor and third most common tumor overall is the testicular interstitial cell tumor (Leydig cell tumor)
- Usually benign, can be bilateral, and have been associated with hypercalcemia
Scrotal vesicle seminal hernia in an intact male domestic guinea pig (Esmaili 2019)

- 9 m, M, progressive swelling involving the right scrotal sac
- Rads: soft tissue SQ swelling
Scrotal vesicle seminal hernia in an intact male domestic guinea pig (Esmaili 2019)

- Fine echogenic structure within the right scrotal sac. An 8 to 9 mm defect associated with the right inguinal ring was also identified in the image (dotted markers)
- Sx: Diazepam 1 mg/kg IM, induction ketamine 4 mg/kg IM & iso mask
Scrotal vesicle seminal hernia in an intact male domestic guinea pig (Esmaili 2019)

Right testicle and seminal vesicle

Seminal vesicle post abdominal orchiectomy
Rabbit reproductive facts/anatomy

- Puberty occurs just after maximal rate of growth
- Sooner in smaller, later in larger breeds
- Lack a uterine body (> each horn has its own opening into the vagina
- Vagina is long and flaccid
- OVH do not squeeze the bladder when the rabbit is in dorsal recumbency because urine flows into the vestibule of the vagina – it does not flow out of the vaginal opening but sits in the vaginal vestibule
- When cutting vagina during OVH, urine will flow out and contaminate the abdominal cavity
Guinea pig reproductive facts

- Puberty 2 m female & 3 m male
- Polyestrous, cycle is 15-17 d, breed year round with spontaneous ovulation
- Gestation 59-72 d
- Birth 2-4 cavies, consume solid food on the same day they are born
- Birthing process no longer than 15-40 m
- Unique GnRH that is different from mammalian GnRH
- Guinea pig GnRH (GpGnRH), major neuropeptide in their brain and it has weaker binding affinity to GnRH receptors
- Therefore, gpGnRh has a markedly lower activity to stimulate luteinizing hormone release
### Gestation periods

<table>
<thead>
<tr>
<th>Species</th>
<th>Gestation Period (d)</th>
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<tbody>
<tr>
<td>Guinea pig (Cavia porcellus)</td>
<td>59–72</td>
</tr>
<tr>
<td>Chinchilla (Chinchilla lanigera)</td>
<td>105–120</td>
</tr>
<tr>
<td>Ferret (Mustela putorius furo)</td>
<td>41–43</td>
</tr>
<tr>
<td>Black tailed prairie dog (Cynomys ludovicianus)</td>
<td>34–37</td>
</tr>
<tr>
<td>Sugar glider (Petaurus breviceps)</td>
<td>15–17</td>
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<tr>
<td>Golden hamster (Mesocricetus auratus)</td>
<td>15–18</td>
</tr>
<tr>
<td>Gerbil (Meriones unguiculatus)</td>
<td>23–26</td>
</tr>
<tr>
<td>White mouse (Mus musculus)</td>
<td>19–21</td>
</tr>
<tr>
<td>Rat (Rattus norvegicus)</td>
<td>21–23</td>
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Endoscopic Oophorectomy in the Rabbit: The Future of Preventative Sterilizations (Divers 2010)

- OVE
- 3 port approach
- Must intubate

(A) Caudal abdomen revealing normal uteri (1), vagina (2) & bladder (3)
(B) 3.5-mm graphite/plastic endotip (threaded) cannula
(C) Right ovary at 30° lateral tilt
(D) View of the ovary (1), grasping forceps (2), vasculature of mesovarium (3), Bipolar forcep (4)
(E) Monopolar scissors to coagulate & cut to dissect (1) the ovary (2) free from the mesovarium (3)
(F) The cannula has been slid up the shaft of the grasping forceps and is no longer visible
   The forceps and ovary (2) are gently withdrawn through the hole in the body wall
(B) OV grasped with the Babcock forceps elevated to the body wall
(C, D) Ovary tacked to body wall using a transabdominal suspension suture, by passing a 5 cm, half circle curved tapper needle through the body wall
(E) The ovary is dissected free by cauterizing and cutting the ovarian pedicle, proper ligament and mesovarium
(F) The ovary has been removed and the surgical site observed to assure hemostasis
Single port laparoscopy assisted Ovariohysterectomy in 3 rabbits (Coleman 2018)

- Full OVH
- Single incision laparoscopic surgery (SILS)
- 2-3 cm incision for the foam access port
- MIS using 1 port & a controlled Hasson approach provides decreased risk of iatrogenic abdominal viscera penetration
- SILS Port (Covidien) also allows easy transition of instruments, telescope & bipolar electrocautery devices amongst the 3 built-in cannulae for ideal triangulation for each side of the patient
- Body wall incision length was reduced vs. open technique
- One incisions vs. multiple port access technique, and subjectively proposed less risk to the cecum with the foam port
- ~50 minutes, no intra or immediate post op complications
Ureteral Stenosis following OVH in a rabbit (Duhammelle 2017)

- 2.5 y history of intermittent anorexia and GIS
- OVH 9 mo prior
- 15 m post OVH, rads & AUS revealed an enlarged L. kidney, calcifications with a dilated pelvis and ureter (▶)
- Sx: adhesions between the broad ligament of the uterus and the middle section of the L. ureter, obstructing urine flow
- L. ureteronephrectomy and no calculus was found inside the ureter
- Path. of the adhesions, ureter & kidney did not reveal any signs of neoplasia or infection
4m, (F) evaluated for a recent onset of lethargy, anorexia, foul-smelling red urine, diarrhea & a soft SQ swelling in the inguinal region

Rads showed a mineral opacity within the SQ tissues ventral to the pelvic girdle

Cytology of fluid aspirated from the mass and an excretory urogram supported the diagnosis of a herniation of the urinary bladder through the right caudoventral abdominal body wall
Surgical Repair of an Inguinal Herniation of the Urinary Bladder in an Intact Female Domestic Rabbit (Grunkemeyer 2010)

- Hernia repaired with an inguinal herniorrhaphy and replacement of the bladder within the abdominal cavity.
- Etiology not determined but was likely congenital or non-traumatically acquired in origin.
EVC similar case
OVH tips!

- If obese might want to postpone
- Pull body wall up, GIT easy to lacerate
- Ovarian A & V far from suspensory ligament, right under ovary
- Don’t ligate the ureters
- Block vaginal body
- Saline splash prior closure to minimize adhesions
Guinea pig

- OVE flank approach, young
- OVH, 1 ventral or 2 stage flank & ventral approach, older or uterine pathology
- Ov. cysts very common can aspirate prior removal
Flank approach (Capello 2011)
Female reproductive diseases

6y, F(S), stranguria and pollakiuria

Endoscopic removal of a vaginal calculus in a domestic rabbit (Tarbert 2016)
Diseases of the ovary: Ovarian cyst

- Very common in GPs
- Easily palpated, unilateral or bilateral, +/- neoplasia
- Symmetric alopecia (if the cyst secretes estrogens), abdominal distension and dyspnea
- US useful to confirm the diagnosis
Ovarian cyst treatment

- Preferably, treatment should be performed with GnRH injections, if surgery declined
- GnRH injections 0.020 mg/GP every 14 d are effective
- Prognosis is considered good
- Deslorelin implants without a significant effect
- A published study noted that the size of the ovarian cysts in 11 guinea pigs did not vary significantly during the treatment
Diseases of the ovary: Ovarian tumors

- Granulosa cell tumors, thecal cell tumors, malignant granulosa cell tumors, ovarian mesotheliomas, tubular adenocarcinomas, papillary cystadenomas, papillary cystadenocarcinomas, Sertoli cell tumors, others

Gerbil Granulosa cell tumor
Diseases of the uterus: Pyometra, mucometra, metritis, and endometritis

- Pyometra ~ develops a few weeks after estrus or delivery
- Ovarian cysts can cause cystic endometrial hyperplasia, mucometra or endometritis
Diseases of the uterus: Cystic endometrial hyperplasia

- Associated with aging, hormonal changes, usually high estrogens levels
- May occur in obesity, polycystic ovary syndrome, estrogen-producing tumors & estrogen replacement therapy
- Common finding in aged female rodents

- Hamster with a uterine hemorrhage secondary to a chronic CEH
- Right uterine horn is dark and full of blood.
- The clot from the right horn (R) was removed
- Cervix (arrow) and the left horn are shown (L)
Cystic endometrial hyperplasia & bacterial endometritis associated with a FB in a guinea pig with ovarian cystic disease (Kohutova 2018)

- 3y, F, 4 m history of nonpruritic hair loss on the ventral abdomen
- PE: flank & ventral abdominal alopecia, mucoid vulvar discharge, and abdominal distension
- Bilateral rounded masses just caudal to the kidneys and structures consistent with enlarged uterine horns were detected on abdominal palpation
- US: bilateral ovarian cysts, thickened uterine horns, and multiple circular hypoechoic and anechoic structures in the uterine wall
- OVH, piece of hay in the left uterine horn.
- C/S: Escherichia coli, Fusobacterium nucleatum, and Arthrobacter spp.
- Infrequently reported in guinea pigs
Multiple endometrial venous aneurysms in a domestic rabbit (Reimnitz 2017)

- 2y F Holland lop rabbit acute onset of hemorrhagic vulvar discharge of several hours duration
- PE dried blood present on perineum, palpably enlarged caudal abdomen, and an enlarged, erythematous vulva
- CBC-n
- Chem- mild hyperglycemia and slightly elevated CK
- Rads enlarged uterus
- AUS revealed soft-tissue masses present in the right uterine horn along with marked dilation of the right uterine horn with echogenic fluid
- Tx: OVH
Multiple endometrial venous aneurysms in a domestic rabbit (Reimnitz 2017)

- **Rads:** (*) uterus, arrow head bladder, arrows colon, line cecum
- **AUS:** large soft-tissue mass (*), Uterus, Baldder
- **VA** are areas of localized abnormal venous dilation that involve a thin vascular wall with complete and normal layering
- **1:** Congenital, with inherent defect to the wall of the vessel
- **2:** Acquired such as secondary to trauma or increased luminal pressure
Diseases of the uterus: tumors

• Benign endometrial stromal tumors, endometrial stromal polyps, histiocytic sarcomas, leiomyosarcoma, stromal sarcoma and adenocarcinoma
• Leiomyomas are the most common neoplasm in guinea pigs
• Correlation between the occurrence of leiomyomas and a hormonally active cystic rete ovarii has been recognized

Mouse with uterine leiomyosarcoma
Diseases of the uterus: tumors

- Previously ovariectomized GP with uterine neoplasia
- Rat uterine body tumor
Vaginal/uterine prolapse

- Can occur after parturition
- CS: straining/prolapse vaginal or uterine tissue in varying condition
- DX: based on CS
- If tissue is healthy, lavage and lubricate before reinserting
- Vaginal closure to maintain reduction, 2-3 HM sutures
- NSAIDs
- Bathing with HTS solution can decrease the swelling
- To prevent toxemia after replacement > OVH
- Prognosis: severity and timeliness of correction, guarded-poor
Dystocia

- CS: vaginal discharge (bloody, green or brown), abdominal swelling, or an impacted fetus protruding from the vulva
- Some species are prone to cannibalism: hamsters, mice & rats
- Disturbing the female during parturition, close observation, like an excessive worrying owner, or newborn handling can be contraindicated because it may predispose to this behavior
- Low environmental temp., lean diets, and low BW can contribute to cannibalism as well
- Gerbils, cannibalism can occur when the size of the litter is very small, no suitable nesting area is found, animals are disturbed, or the female has mastitis
Pregnancy toxemia 2 forms

Metabolic disorder, obese sows

- More common and develops from late pregnancy to early lactation
- D/T starvation, dietary changes, environmental factors & stress
- Anorexia, dehydration, severe cases lateral recumbency & dyspnea
- Hypoglycemia (<60 mg/dL), convulsions and death
- Blood work: ketosis, hypoglycemia & acidosis
- UA: proteinuria, ketonuria & a pH of 5-6 (normal pH = 9)
- Rads/US: hepatic enlargement & gas-filled GIT
- Tx: IVF & glucose is essential
- Feeding a high-caloric critical care rodent diet, which contains readily available CHOs q2-3h
- Guarded to grave prognosis
Pregnancy toxemia

Hemodynamic problems & uteroplacental ischemia

- Caused by severe compression of the large blood vessels by the gravid uterus
- Preeclampsia develops in late pregnancy
- Uterine ischemia > necrosis, hypertension, proteinuria & increased Cr levels
- If suspected, confirm via blood work, rads & AUS
- If confirmed ER C-section must be performed immediately
Mammary gland disease: Mastitis

- Rats & mice mastitis rodent model
- 1 mammary gland is usually affected, can be ulcerated
- *P. pneumotropica* & *Staph. aureus* are most commonly cultured
- Predisposing factors are dirty environments, abrasive material bedding, inappropriate size & equipment cage, biting puppies & mammary impaction
- Tx. based on C/S; however, fluoroquinolones or sulfamides can be used as 1st choice
- Analgesics & supported treatment

Ulcerated inguinal mammary gland ▲ secondary to infection in a rat
- Rat with a mastitis and abscess
- Lateral skin incision was made to the ulcer; purulent material is going out of the mammary gland abscess.
“Mammary gland disease”: Pseudocyesis sp???

- Very common in rabbits
- Induced ovulators, ongoing high estrogen levels
- Usually have underlying reproductive pathology
Unwanted pregnancy

- Very common GPs bought from stores
- Pet supply greater than demand
- Create realistic expectations with placement of offsprings & responsibilities involved
Mammary gland disease: Tumors

- Very common in rats
- Extensive mammary tissue
- Female, but also some males
- In rats, most are benign fibroadenomas
- Adenocarcinomas can appear but are uncommon
- Incidence increases with age
Mammary gland disease: Tumors/mastitis in males

- Intact
- Mastectomy/neuter
- Biopsy
Rabbit syphilis: *Treponema cuniculi*

- **Cs:** “Mucosal disease” nose, lips & genitals
- **Dx:** Visual, biopsy
- **Tx:** Penicillin, other antibiotics
Chinchillas
Paraphimosis - the inability to replace the glans back into the prepuce
A. Fur ring: in breeding males or those kept alone, may be painful and cause urethral obstruction, they should be gently removed
B. Excessive smegma accumulation
C. Secondary to acute balanoposthitis (Pseudomonas aeruginosa)

D. Phimosis – inability to completely protrude the glans penis from the prepuce or entrapment of the penis within the prepuce
CS: 7y, F, acute onset of hemorrhagic vaginal discharge
US: hyperechoic mineralizations in uterus and mild effusion
SX: Severely enlarged uteri, incomplete fetal resorption
Histopath: **Endometritis**
Uterine Leiomyoma, Fibroma & Hemangioma in 2 Chinchilllas (Bertram 2019)

• 12 & 13 year old F
• Reduced appetite & production of small fecal pellets
• Reduced vaginal membrane, bloody vaginal discharge & a caudal abdominal mass
• Severe, regenerative normochromic anemia, increased reticulocyte count, elevated AST, ALT GLDH, Total bili & urea
• 1 died, 1 eut
• Clinically observed bloody vaginal discharge was indicative of a genital tract
• Both cases the bleeding was caused by a neoplastic mass, a fibroma and a hemangioma respectively

Nonhomogeneous structure & blood vessels were visible in some areas
Male ferrets

- Prostatic hyperplasia and prostatitis
- Associated with adrenal gland disease
- Increase levels of androgens
- CS: dysuria, stranguria, oliguria, pollakiuria, urine dibbling, preputial dermatitis, and/or preputial trauma
- Owners commonly report tenesmus during defecation
- Prostatomegaly can lead to partial or complete, life-threatening urethral obstruction
Prostate disease

- **TX:** catheterization, cystocentesis, and/or tube cystostomy
- **TX:** of cysts or abscesses: Surgical excision, marsupialization & prostatic abscess omentalandization
ACD males

- Adrenal gland disease should be addressed simultaneously
- Surgically (adrenalectomy) and/or using hormonal treatment
- Lupron depot (GnRH agonist) 100–250 µg/kg/mo IM
- ~ prostatic tissue shrinks 12-48h
- Deslorelin implant effective and safe treatment of ACD
- Flare-up effect (up to 2-3 weeks) the effect on prostate size is much slower
- Anastrozole (0.1 mg/kg PO q24) adjunct tx.
- Flutamide 10 mg/kg q12-24, bicalutamide 5 mg/kg q24h or finasteride 5 mg/kg q24)
Tumors of the apocrine glands of the prepuce

- Profoundly increased incidence of malignancy ~75%
- Aggressive infiltration of local tissues, metastasis to local lymph nodes & occasionally pulmonary metastasis
- Recur at excision sites, readily and quickly metastasize
- The “wackawinnie” and PU

Mets to lumbar lymph nodes
African Pigmy Hedgehog

- Females
- Primarily uterine disease
- Inflammatory >>> Neoplastic
- Good prognosis, “if nothing else going on”
• Male Guinea Pigs > abdominal, ideally young no need for testes to drop just fit for anesthesia
• Female Guinea Pigs flank if young or no uterine pathology; cyst aspirate prior, otherwise 2 step
• Female rats flank
• Female rabbits watch for ureteral entrapment
• Practice ACD prevention in ferrets with Deslorelin
• Practice catheterizing male ferrets prior to obstruction and have plans for bladder decompression
Conclusion

• Reproductive medicine & surgery in ECMs is a rapidly growing discipline
• ECMs has one of the largest peer-reviewed submission of case reports & data being submitted yearly, so stay up with the literature
• Small & large animal techniques can easily be adapted to manage cases
• Minimize trauma through gentle soft tissue handling techniques and anatomical knowledge
• Attend CE wet labs to enhance skills
• Thank the internet for some great images
• Publish what you see, it is easier than you think
Thanks!