Rabbit Urinary Disease

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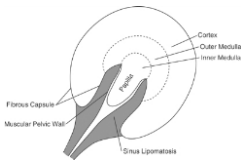
Lecture outline

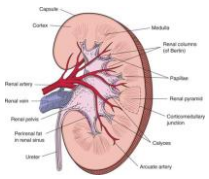
- Introduction to rabbit urinary system
- Approach to "Sludgy bladder" syndrome
- E. cuniculi
- Management of the rabbit with CRF

Urinary anatomy

Unipapillate (rabbit)



Multipapillate (human)



Calcium physiology in rabbits

- Rabbits passively absorb all dietary calcium (independent of vitamin D)
- Blood calcium levels are therefore higher than for other species
- The kidneys play an important role in controlling blood calcium levels by regulating excretion
- 45-60% of calcium is excreted via the kidneys compared to <2% in other mammals

Causes of urinary disease include

- Bacterial infections (*Pasteurella* and *Staphylococcus*)
- E. cuniculi
- Amyloidosis
- Benign embryonal nephroma
- Renal carcinoma
- Lymphoma
- Polycystic kidney syndrome in New Zealand whites
- Renal agenesis in Havana rabbits
- Toxins as in other species
- Hypotension
- Hypertension

"Sludgy bladder" syndrome

"Sludgy bladder"

High levels of calcium in urine?

Inadequate bladder emptying

Calcium crystals build up in bladder

Cystitis

Dehydration

Causes of "Sludgy bladder"

* Renal damage
* High calcium diet?
* Dehydration
* Obesity
* Pain
* Neurological deficit

Presentation

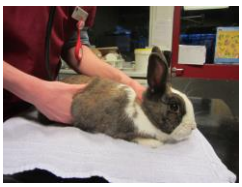
* Urine scalding
* Incontinence
* Discoloured urine
* Gut stasis
* Anorexia
* Lethargy
* Weight loss

History

* Complete husbandry history
* Diet
* Changes in environment
* Companion rabbits
* Opportunities to exercise
* Standard medical history

Clinical exam

* Full clinical exam
* Palpate kidneys (unless hidden in fat) and bladder
* Neurological exam may be indicated BUT
* Rabbits are prey animals so may not react



Urinalysis

* Dipstick
* Specific gravity (1.003-1.036)
* Sediment

* Normal rabbit urine may contain porphyrin pigments
* Alkaline pH 7.6-8.8
* Trace proteinuria

Urinalysis

* Calcium carbonate and oxalate crystals are normally seen in rabbit urine
* Rabbits with "sludgy bladder" pass urine with a consistency of cement
* Cystocentesis may be unrewarding in these cases

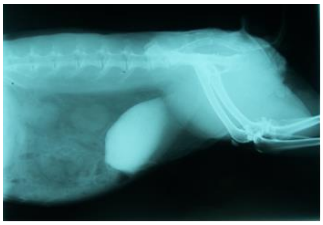
Urinalysis

* Measuring urine protein creatinine ratio (0.11-0.14) may detect early signs of renal damage
* Normal urine GGT levels have recently been determined and may be an indicator of renal disease (2.7–96.5 IU/l)
* Urine culture and sensitivity may also be indicated

Bloods

* Changes in biochemistry are only seen when >75% of renal function is lost
* Urea (variable)
* Creatinine
* GGT
* Phosphorus

Abdominal X-rays



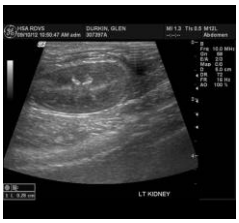
Negative contrast retrograde urethrogram

Positive contrast retrograde urethrogram

Intravenous urogram

Ultrasound

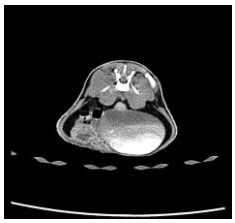
Nephroliths or ureteroliths



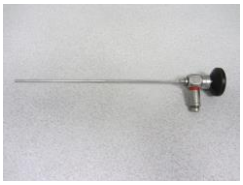
- Associated with high blood calcium levels?
- XS dietary calcium
- XS dietary Vitamin D

- Or consequence of renal damage

CT

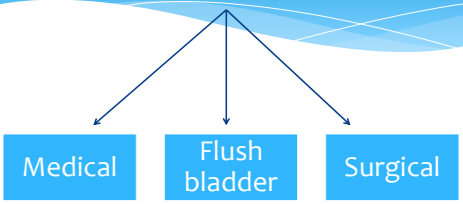


Cystoscopy



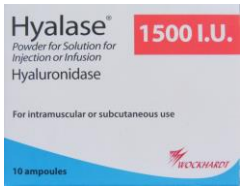
- Useful for evaluation of bladder mucosa
- Detection of polyps or neoplasia
- Bladder flushing may be performed under endoscopic guidance

Treatment options



Fluid therapy

- 100ml/kg/day maintenance
- Intravenous route preferred
- Alternatively subcutaneous with addition of hyaluronidase
- 1500IU/ L fluids



General nursing care

- Syringe feeding may be necessary to prevent gut stasis and increase fluid intake
- Grooming
- Treatment of associated pododermatitis

Analgesia

- NSAIDs may be used if there are no underlying renal concerns
- Meloxicam <0.6mg/kg q12hrs
- Buprenorphine 0.05mg/kg q6-8hrs

Treat urinary infections

- Ideally base antibiotic choice on culture and sensitivity
- Co-trimoxazole 30mg/kg PO q12 hrs is a good first-line choice

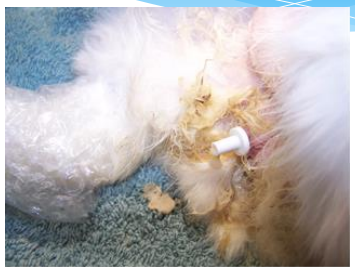
Reduce dietary items high in calcium

- Alfalfa hay
- Pellets
- Clover
- Carrot tops
- Goosegrass
- Kale
- Sowthistle
- Broccoli
- Cauliflower
- Spear thistle
- Shepherd's purse
- Swiss chard
- Beet greens
- Endive
- Bok choy

Increase water intake

- Provide multiple water sources both in bottles and bowls
- Add water to greens
- Add water to pellets

Flush bladder



Cystotomy

Cystotomy

Encephalitozoon cuniculi

E cuniculi

* E. cuniculi is a small intracellular protozoal parasite
* It is best known for causing disease in rabbits, but has also been reported in other species including primates, dogs, cats, guinea pigs and even birds
* It is potentially a **zoonotic** infection, and may cause serious disease in immunosuppressed individuals

E. Cuniculi pathogenesis

Spore ingested → Spore infects GI epithelium → Spore travels via blood stream to target organs

Clinical signs of E cuniculi

- Neurological signs are most common especially a head tilt
- Urinary incontinence
- Weight loss
- Anorexia
- Lethargy
- Ocular lesions

Serological tests

Spore is ingested → IgM levels detectable • Day 17 → IgG levels detectable • Day 21-28

Other diagnostics

- Spores may be excreted intermittently in the urine **3-5 weeks** following seroconversion
- PCR tests are available

- Histological changes in the kidney may be seen **4 weeks** following seroconversion
- Histological changes in the brain may be seen **8 weeks** following seroconversion

E cuniculi treatment

- Fenbendazole 20mg/kg once daily for 28 days has been shown to successfully treat E. cuniculi
- Preventative courses of 9 days have also been advocated

Renal failure

Renal failure

May be acute or chronic (usually in older rabbits)

* Anorexia
* Lethargy
* Weight loss
* PUPD
* Bruxism
* Gut stasis

Diagnosis of renal failure

* Blood urea insensitive in rabbits as can be affected by caecal microflora urea metabolism
* X-rays and ultrasound may show renal changes
* Renal biopsies are necessary to confirm
* Laparoscopic biopsies may be preferred
* Check blood pressure?

Management of renal failure

* Similar approach to cats

* Palliative care
* Reduce feeding of high calcium items in diet
* Increase fluid intake
* ACE-inhibitors

* Rabbits often do not show signs until urinary disease is advanced
* Do not underestimate severity of disease – long courses of treatment may be required
* Always look for an underlying cause