DISEASES OF urinary SYSTEM

- Urolithiasis
- Renal failure - Uraemia
- Feline urological syndrome

Urolithiasis in dogs

- **Definition:** It is the urinary calculi usually occur in the urinary tract of the breeds of dogs such as Dalamation, Pug, bulldog, Welsh corgi, Basset Hound and Beagle breeds of dogs.

Causes of urolithiasis

- 1-Matrix hyothesis
- The presence of inorganic protein matrix (mucoprotein) is the initiating cause of the condition.
- 2- Crystallization inhibition hypothesis:
- There are organic and inorganic crystalline inhibitors in the urine. Their absence leads to calculi formation.
- 3-Precipitation –crystallization hypothesis.
- There are salt supper saturation predispose to calculi formation.
- The organic stones (urate and cystine) are metabolic in origin while inorganic triple phosphate is preceded by infection as *staph*. and *proteus*.

Types of calcui

1-Phosphate calculi (magnesium –amm. Phosphate) or struvite (inorganic)

- 60% incidence in most breeds
- associated with infection (staph & proteus)
- large, spherical tetrahedral
- radiopaque
- Urine contains protein, pus cells, RBCs, epithelial cells, and alkaline Ph (7-8.5).

2-oxalate calculi (inorganic)

- 14 % incidence
- small with either rough, blood stained and have sharp shelflike crystals in dicalcium salt or smooth surface and brittle in monocalcium salt.
- Radiopaque

3-Urate calculi (organic)

- 6% incidence mostly in Dalmatian dogs
- Associated with blood and may be infection.
- It is small and numerous in both bladder and urethera (causes uretheral obstruction)
- Radiolucent (need contrast technique)

4- Cystine calculi:

- 20% incidence in young of all breeds
- it is due to defective tubular reabsorption of amino acid cystine
- it is small found in bladder and urethera
- radiolucent.

Symptoms

- There are four forms

A. Uretheral obstruction.
B. Ureteral calculi
C. Renal calculi
D. Bladder calculi

A-Uretheral obstruction:

- It is a medical emergency as death may occur 24-48 hr.
- Straining frequently with the passage of small amount of drops of urine.
- Blood in urine.
- Distended bladder → reach the rib cage.
- Catheter used to locate the site of the calculi
- Radiography is essential
- Signs of uraemia

B. Bladder uroliths:

- Frequent urination.
- Haematuria at the end of urination.
- Strong ammonical odour in bacterial infection with inactivity and poor appetite.
- Palpate large calculi from outside.
- Radiograph by double contrast technique.

C. Renal urolith (kidney stones)

- Severe abdominal pain
- Haematouria
- Uraemia if kidney tissue was severely injured
- Cloudy urine in bacterial infection due to pus cells, bacteria, RBCs, and renal tubular epithelial cells.
- Only detected by radiograph.

D. Ureteral calculi:

- Severe abdominal pain
- Biting at the flank
- Blood in urine
- Radiography.

Diagnosis:

- History
- Physical examination
- Palpation and radiography were confirmative
- Urine analysis

Treatment

1-To relief obstructive urolith.

- Using small diameter catheter either to bypass the stone or to push to the bladder.
- Remove the stone by using alligator forceps
- Using hydraulic pressure to dilate urethra
  - This is done by compressing pelvic urethra by digital pressure around it and at the same time push vigorously saline solution via the catheter. Suddenly release digital or catheter pressure. The stone will either push inside or outside.

Bladder calculi:

- Surgical cystotomy
- Removal or elimination of infection (urease producing infection) to prevent phosphate calculi formation Chloramphenical 11 mg /B.wt I.M. or 20-50 mg/kg B.wt. orally as 3 divided doses (1 capsule for 3 times).
- Ampicillin 10-20 mg/kg B. wt. I.M.
  - 30-60 mg /kg B.wt. orally
- Nitrofurantoin 4-5 mg/kg B. wt. Orally
- trimethoprim – sulfadiazin (tribrissen)
  - trimethoprim 20 mg
  - sulfadiazine 100mg
  - give dogs and cats 30 mg /kg B.wt. orally

Kidney stones (soft phosphate concretion)

- Antibacterial agents.
- Surgical-removal in large stones.
- **A-phosphate calculi**
- Antibacterial agents.
- Acidification (its useless without elimination of urease producing bacteria)
- Increase salts in diet.
- **B- Urate Calculi (in Dalmatian dogs)**
- Alkaline urine by sodium bicarbonate I.V. 3.75 gm/liter

C- **Cystine calculi:**

- Alkaline urine by sodium bicarbonate.
- D-penicillamin tablets. To form soluble. Penicillamin – cystine 30 mg/kg B. wt in divided doses.

Oxalate calculi:

- Keep urine dilute as possible
- Antibacterial agents.
- Increase calcium concentration in urine by chlorothiazed 11-22 mg/kg B.wt orally in divided doses.

Medical emergency interference analgesics and smooth muscle relaxant

- *Sedatives as:*
- Rx phenobarbital sodium 22mg/kg body weight.

I.V. slowly to the effect.

- *Antispasmodic as:*
- Rx atropine sulphate 1% or 0.1% by I/M or S/C.
  - Dogs: 88-110 mg/kg body weight
  - Cats: 44-88mg/kg body weight.

Questions