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AFFECTIONS OF URINARY SYSTEM

I-PERVIOUS URACHUS

Definition: It is a congenital defect of the urinary tract characterized by failure of the urachus to obliterate at birth.

Signs:

1-In recent cases the hair at the umbilical area remains wet due to continuous dribbling of urine through the umbilicus

2-In old cases the animal may show ascending infection of the umbilicus, abscess formation, peritonitis, cystitis, omphalophlibitis, or poly arthritis.

Treatment:

1-Conservative treatment: - It can be used if there is no complication. It is performed by repeated cauterization of the urachus to enhance healing and obliteration.

2-Surgical treatment: - It can be used if conservative treatment failed or if there is complication.

Technique:

1-Aseptic preparation of umbilical region.

2-Anesthsia

3-Eleptical incision around the umbilicus, then the umbilical vessels are ligated proximal to the abscess and cut. The stump is touched with Tr. Iodine. The urachus is located, double ligated, and cut, then the stump is cauterized with phenol 90%. The abdominal wall is closed as usual.

4-Silk is removed after 8-10 days

II-URINE RETENTION

Definition: It is the inability of the animal to empty the bladder.

Etiology:

1-Obstruction of the urethra due to a calculus or tumor

2-Constipation when the rectal contents press on the pelvic urethra

3-Paralysis of the bladder as in case of accidental trauma of the spinal cord

4-Spasms of the neck of the bladder that may occur in association with other conditions like colic and tetanus

Urolithiasis or urinary stones Urinary calculi occur in all species of animals, but it is of special importance in ruminants being fed heavy concentrated ration or grazing pastures of plants containing large quantities of oxalates, silica, or estrogens.

Seat of the stone:

Urinary calculi may be formed in the kidney or the bladder any part of the urinary tract like;

1-The kidney (Renal calculi)

2-The ureters (Uretral calculi)

3-The urinary bladder (Vesical or cystic calculi)

4-The urethra (Urethral)

Types of urinary stones: -

1-According to the size: -

l-Sabulous material like fine sand

2-Gravel or small concretions resembling coarse sand

3-Small calculi, or stones (capable of passing through the ureter to the bladder

4-Large calculi incapable of passage through the ureter

2-According to the species: -

1- Equines usually calcium carbonates

2- Ruminants usually calcium oxalate

3-Ruminants fed concentrated ration usually calcium, magnesium, and ammonium phosphate.

4-Carnivores usually magnesium and calcium triphosphate or carbonate. Oxalate, ureate, and cystine stones may be present. In some cases the stone may be mixed containing one or more of the mentioned salts.

Etiology:

1-Hereditary predisposing factors

2-Excess of certain salts in the ration or water e.g. magnesium and calcium oxalate

3-Excess of nitrogenous materials in the ration as in ruminants fed on cake, grains, and bran.

4-Insufficient or limited water intake or drinking highly mineralized artesian water

5-The pH of the urine affects the solubility of some salts. Alkaline urine favors formation of mixed phosphate and carbonate calculi.

6-Inflammation of mucous membrane of urinary tract as in case of pyelonephritis and cystitis. The desquamated epithelium forms a nidus up on which the salts are deposited

7-Avitaminosis A in summer months may be a factor as vitamin A is essential for healthy epithelium

8-Early castration of small ruminants that predisposes to infantile or rudimentary penis and narrow urethra 9-Anatomical considerations play a role in the lodgment of the calculi in the penile urethra.

a-In large and small male ruminants, the sigmoid flexure

b-In small male ruminants, the urethral process

c-In dogs, the level of the caudal end of the urethral grooves of the os penis

Symptoms: Urolithiasis occurs in both males and females, however, males are more susceptible to urine retention as a result of lodgment of the stones in the sigmoid flexure or urethral process.

A-Intact bladder: -

1-Colic; straining, grunting, and grating the teeth; stiff gait; and arched back

2-Anurea in case of complete obstruction, or dripping of bloody urine (hematourea) in case of partial obstruction

3-Loss of appetite and depression

4-Urethra is painful on manipulation

5-Presence of urethral pulsation on finger rectal examination

B-Ruptured bladder: -

1-History of anurea for longer period (2-3 days)

2-Absence of urethral pulsation on finger rectal examination

3-Conistipation and inspissations of fecal matter

4-Enlargment of the abdomen as a result of uroperitoneum

5-On exploratory puncture of the abdomen, urine comes out

6-General signs of depression, off food, and lethargy

7-Uremia is the fate if the animal is not treated (the breath has urenephrous odor, nervous sings like severe depression, and death)

Diagnosis:

1-History

2-Signs

3-Clinical examination

a-Palpation of bladder reveals its over filling or rupturing

b-Presence or absence of urethral pulsation by finger rectal palpation

c-Detection of the seat of stone lodgment by palpation

d-Exploratory puncturing of the abdomen in case of ruptured bladder

f-Presence of the stone at the root of urethral process, or presence of adhesion of this process to the glans penis in case of male small ruminants

4-Radiography and sonography

Treatment:

1-Medical treatment: This method usually fails, however it can be tried an the aim of most of drugs used is to help pushing of the stone or relieving the spasm of the urethra around it. This method is used only for cases with intact bladder

A-Spasmolytics: - Drugs like anlagen can be used to relieve spasm of the urethra to help pushing of the stone under gravity by the accumulated urine in the bladder.

B-Diuretics: - Diuretics and fluid therapy can be used to help pushing of the stone, however, if the fluid therapy couldn't push the stone, rupture of the bladder or the urethra will ensue

C-Parasympathomimitics: - Parasympathomimitics like neostigmine or acaprine were tried also, they will induce severe contraction of the bladder and this method either will push the stone or will cause rupture of the bladder or the urethra

D-Parasympatholytics: - Atropine has been used by many veterinarians to prevent contraction of the bladder and the subsequent rupture, and the aim of its use is the pushing of the stone by the accumulated urine under gravity

E-Tranquilizers or sedatives: - Tranquilizers and sedatives like xylazine HCl were used to induce relaxation of the penis that may help pushing the stone from sigmoid flexure

2-Surgical treatment: -

A-Intact bladder: - Animals with intact bladder can be treated surgically by many techniques, however, the fate of the animal after surgery, the cost, and the complications of surgery control the choice of such techniques.

i-Urethrostomy: - This technique aims at creation of a fistula in the perineal urethra at a level higher than the seat of obstruction.

Subject: Calves and rams

Technique:

1-Aseptic preparation of the perineal region

2-Anesthesia by epidural analgesia, and sedation

3-The animal is kept in lateral recumbency, and then an incision is made 10-20 cm below the anus. This incision is advanced to the perineal muscles till reaching the penis. The retractor penis muscle in large ruminants lie directly over the penis and shouldn't be mistaken for the penis itself, while in small ruminants it lies lateral to the body of the penis, the muscles are taken lateral to the penis and the penis is exteriorized by curved hemostatic forceps. An incision is made to the caudal aspect of the penis and directly over the urethra. Urine will void from the seat of urethral incision and this is an indication that the bladder is intact and the technique advances in successful manner. The wall of the urethra is fixed to the skin by silk in a simple interrupted manner fir creation of a fistula.

Advantages:

1-Simple and easy technique

2-The technique needs no special complicated tools, or high experience

3-The cost of the operation is low

Disadvantages:

1-High probability of death during surgery as a result of severe bleeding

2-Scald of the skin over the scrotum and the posterior aspect of the thigh

3-The fistula narrows over time and the maximum use of the animal is 6 months after which re-widening of the fistula is needed, otherwise the animal will suffer from retention again.

4-Higher probability of ascending cystitis

5-Animals are sold for low price

6-Animals can't be used for breeding purposes

ii-Urethrotomy: - This technique can be used for animals with intact bladder too

Subject: Calves and rams

Technique:

1-Aseptic preparation of the perineal region

2-Anesthesia by epidural analgesia, and sedation

3-The animal is kept in lateral recumbency, the seat of stone is detected, the skin over the seat of obstruction is incised, the penis is exteriorized, then the stone is removed by;

a-Ventral urethrotomy technique by incising the urethra directly over the stone.

b-Dorsal urethrotomy technique by incising the body of the penis dorsally and longitudinally 4-Seat of incision in the urethra or penis is closed with vicryl No. 5/0

5-The penis is washed with saline and lubricated with oily antibiotic, and the skin is closed

Advantages of ventral urethrotomy:

1-Simple method as the stone is superficial

2-The disadvantages of urethrostomy can be avoided

Disadvantages:

1-The high probability of stenosis after suturing and subsequent obstruction with smaller stones

2-The high probability of leakage of urine through incision line and subsequent gangrene

Advantages of dorsal urethrotomy:

1-The low probability of stenosis after suturing

2-The low probability of leakage of urine through incision line

3-The disadvantages of urethrostomy can be avoided

Disadvantages:

1-Techniqually more difficult

iii-Tube cystotomy: - It is a process through which the bladder is catheterized after laparotomy, and the urine comes out through this catheter either temporarily or permanently

Subject: Calves

Technique:

1-Aseptic preparation of the left flank or the left prepubic region

2-Anesthesia

3-The abdominal wall is incised in layers, the intact or ruptured bladder is located, and a Folly catheter or Rayle's tube is introduced to the bladder and a purse string is made around it.

4-Folly catheter can pass through the flank and fixed outside, or if the surgeon used Rayle's tube, it can pas through the prepuce and fixed to the glans penis.

5-The abdominal wall is closed as usual. The aim of using Folly catheter (temporary) is the hope that the stone will dissolve and when the animal starts to urinate normally, the catheter can be removed, while using Rayle's tube is a permanent method of urine diversion.

iv-Amputation of urethral process: - This technique can be used for rams with intact bladder

Subject: Rams

Technique:

1-The animal administered tranquilizer or injected with epidural analgesia for relaxation of the penis.

2-The penis is protruded manually then the adhered urethral process is dissected and removed after which the animal will urinate. This indicated that the stone was lodged in the urethral process, otherwise, the stone is higher in level and requires urethrostomy as it is a cheaper method of treatment cause the cost of laparotomy is higher than the animal price in our localities.

B-Ruptured bladder: -

i-Tube cystotomy: - AS mentioned before

ii-Laparotomy: - The only solution of ruptured bladder is laparotomy for welding of the bladder, preceded by urethrotomy for removal of the stone

Subject: Calves

Technique:

1-Aseptic preparation of the left prepubic region

2-Anesthesia by epidural analgesia, and sedation if sedation doesn't threaten the animal due to bad the general health condition

3-The animal is kept in lateral recumbency, with the right flank facing the ground. An oblique anterior-ventral incision is made at the prepubic region. The prepuce is splitted and the penis is exteriorized. The stone is removed by urethrotomy, the seat of incision over the stone is sutured, and the penis is lubricated with oily antibiotic and the prepuce is sutured.

4-Through the same prepubic incision, laparotomy is performed and the left hand is introduced to the abdomen and urine is prevented from escape to preserve the abdominal distension. The bladder is located, cleaned from other stones or clotted blood, then a Rayel's tube is inserted to the bladder and advanced through its neck to the urethra and exteriorized through the external urethral orifice.

5-The stump of Rayel's is removed and the tube is fenestrated and kept inside the bladder, the wound of the bladder is closed with catgut, the abdominal wall is sutured in layers, and finally the skin is sutured.

6-The catheter is removed after 3 days and its function during this period is lowering pressure on sutured areas in the bladder and urethra, and the silk is removed after 8-10 days.

Advantages:

1-The disadvantages of urethrostomy can be avoided

2-The high loss by slaughtering the animal can be avoided

Disadvantages:

1-The high cost

2-The need for special equipments

3-The need for high skills and experiences

iii- Bladder Marsupialization

Definition: It is a technique through which the wound of the bladder is sutured to the abdominal wall (creation of fistula between the bladder and outside)

Subject: Goat

Disadvantages:

1-High incidence of ascending cystitis

2-Urine scald

III-RUPTURED URETHRA

Definition: It is a process through which the urethra undergoes rupture and the urine comes subcutaneously with gradual swelling at the belle and scrotal region. This case is usually not accompanied with rupture of the bladder.

Etiology:

1-Urine retention by stone

2-Trauma

Signs:

1-Absence of urination

2-Gradually increasing swelling at the scrotal and ventral abdominal region

3-Presence of urethral pulsation by finger rectal examination

4-Slow on set of moist gangrene at the seat of swelling including;

a-Formation of dark blue skin areas

b-The hair can be removed easily form affected areas

c-Exploratory puncturing reveals urine accumulation with clear odor of ammonia that gradually changes to bad odor 5-Final death due to septicemia

Treatment:

1-Urethrostomy

2-Scarification of the swelling for evacuation of urine

3-Control of moist gangrene