

## URINOGENITAL SYSTEM INJURIES

### 1) THE KIDNEYS

Causes: Blunt and sharp trauma, obstruction to urine outflow, poisons, leptospirosis.

Signs: Pain in the anterior dorsal abdomen. May see haematuria or oliguria or anuria. Azotaemia may develop if neither kidney is functioning. Kidneys are an important regulator of acid / base balance so watch for signs of acidosis ( panting with no other obvious cause, this makes the lungs lose CO<sub>2</sub> which is acidic). Watch for signs of blood loss and measure urine output (catheter) and blood urea. Serial measurements are often the most useful. N.B. Fluids may be appropriate or may be contra-indicated (e.g. in obstruction), depending on whether there is any kidney function.

a/Trauma Sharp trauma to the kidneys is relatively rare as they are well protected internally and mobile. Blunt trauma is more common and is usually the result of an RTA, although for the damage to be serious, the trauma has to be very severe. The Right kidney is further forward, and is better sheltered by the ribs, so the Left, which is more mobile and lies further back, is more commonly the damaged one, and usually suffers from crush injuries or haematomas. The renal blood supply comes straight off the Aorta, so haemorrhage is usually acute and severe. The kidney capsule may be able to contain it, giving rise to a haematoma, or it may escape behind the peritoneum, and blood may be seen lying under the lumbar muscles, thus there may be severe blood loss without it appearing in the peritoneal cavity, and abdominal swelling is variable. Always keep an eye on the circulatory markers (pulse, colour, refill time.).

Treatment: If monitoring reveals signs of haemorrhage then fluid or blood transfusions are appropriate., but urinary output must be measured via a catheter to check that there is kidney output.

b/ Outflow obstruction Urinary output can be obstructed by calculi, incorrectly applied surgical ligatures (e.g. during spaying, particularly through unnecessarily small holes). If the other kidney is functioning, then it will clear waste products, so pain may be the only sign initially. Eventually hydronephrosis develops and the damaged kidney swells and becomes non-functional.

c/ Poisons Antifreeze (ethylene glycol), Heavy metals, Chlorate and paraquat weedkillers.

Treatment: Usually fast fluid transfusions, sometimes with diuretics are used to dilute and flush the poisons out. It may be appropriate to try to acidify or alkalinise the urine, depending on the poison.

d/ Infection Leptospirosis- a zoonosis passed via the URINE, see under the liver damage section.

### 2) THE URETERS Causes: Severed or damaged due to trauma (may be torn away from the bladder), Blockage by calculi, or damaged by surgery as above.

Signs: May not develop for days, depending on the functioning of the other kidney. Blockage causes signs as for renal outflow obstruction, but the ureters are behind the peritoneum, so urine will try to accumulate in the space under the lumbar spine. Giving fluids will initially improve the situation by dilution of the urine, but uraemia will eventually develop and surgical attention will be necessary.

### 3) The Bladder

Injuries:

1) Blunt trauma, Rupture ( either due to excessive internal pressure or external trauma) Most blunt bladder damage is the result of a road accident, although cats particularly are vulnerable to kicks, and occasionally abdominal damage results from a heavy door shutting on the animal or a Springer (!) squeezing through too narrow a gap in the fence. Blunt trauma can cause damage ranging from serious rupture to less serious haematoma or bruise formation. Ruptured bladders can occur in cases of UROLITHIASIS in which the bladder exit is blocked by calculi or bladder stones.

2) Herniation If a perineal hernia occurs or there is a tear (rupture) in the body wall, then the bladder can HERNIATE through the hole which is formed. This traps urine in the bladder. In the case of perineal hernia, the bladder flips back-to-front into the hernia. This also blocks off the outflow of urine.

Signs: Simple bruising gives signs of cystitis as the bladder is sore, i.e. frequency, straining, possibly haematuria and/or proteinuria. The protein is not coming out of the kidney tubules so there are no casts in it. Rupture and other causes of failure to evacuate urine causes signs of renal failure to develop, as the waste products from the kidneys are retained in the body. AZOTAEMIA develops as urea accumulates. This is accompanied by oliguria or anuria. Halitosis may develop as renal toxins are lost on the breath. **BEWARE!:** URINATION MAY OCCUR IN CASES OF RUPTURED BLADDER Always: Palpate for the bladder; check urine output; watch for abdominal swelling; monitor blood urea regularly.

First Aid None obvious apart from routine measures to make the patient more comfortable, fluids may be necessary but may contribute to the problem if the patient cannot urinate.

### 4) The Urethra

Injuries: Trauma due to pelvic fractures, bite wounds (in male dogs, in which the urethra has a long course past the back of the pelvis), rough catheterisation, and calculi. The animal may be able to urinate initially, but lose this ability with post-trauma swelling. Leaking urine will cause local inflammation. Obvious problems due to calculi are much more common in males due to a longer and narrower urethra. Cats develop sand-like material in the urine (feline urolithiasis syndrome or FUS).

First Aid Control any haemorrhage associated with the primary injury Catheterisation Can be attempted in the conscious standing male dog if necessary, but is not possible in fully conscious tom cats or female dogs or cats due to their anatomy. Tom cats require the use of a Jackson

cat catheter. The value of catheterisation is in establishing urine output -  
 Quantity (should be up to 50ml / kg / day) -Quality (Test for SG, protein,  
 other abnormalities on dipstick)

## 5) Penis

### Injuries

a/Bites and Trauma. Commonest in intact (rather than castrated) males, and is usually the result of fighting or injuries whilst roaming. The penis is potentially a very vascular structure; during erection, a natural tourniquet effect allows blood in but not out, and this can result in serious haemorrhage.

First Aid for this is therefore pressure and cold compresses. Firm pressure just in front of the scrotum may be successful in controlling haemorrhage by pressure on the blood vessels. An elizabethan collar is essential to prevent further self-trauma.

b/ Paraphimosis This occurs when the penis becomes erect, and is then trapped in this state, usually by preputial hairs binding to the penis and preventing retraction. Often occurs in younger animals which have a tendency to become over-excited! The trapped penis swells further because of the restricted blood supply, becoming oedematous and then eventually gangrenous. It is also susceptible to trauma in its enlarged state.

First Aid- Try to replace using lots of cold lubricant. Obviously, be very cautious when handling dogs in an understandably distressed state. Retracting the prepuce a little further can often allow the end to free itself from the penis. Keeping the penis moist is essential to maintain viability. Cold, strong solutions of salt or even sugar may help to draw water from an inflamed penis and so reduce its size and allow replacement. Some of these cases are surgical, and can only be kept moist until anaesthesia can be induced.

c/ Foreign bodies Grass seeds are the commonest foreign body, and if fresh can be flushed out by using water or saline, particularly if used to "balloon" up the prepuce by gently pinching the end and using a syringe to introduce the flush.

## 6) INJURIES TO VAGINA AND VULVA

a/Trauma Is rare, due to the protected anatomy of these structures. RTA's causing pelvic damage, and problematic parturitions can cause lacerations and hence haemorrhage, but this is difficult to control by applying first aid measures.

b/ Pyometra "Pus in the womb". Is an infection in the uterus occurring during METOESTRUS. If the cervix is open then a vaginal discharge occurs, but the nature of this can be anything from bloody ("come back in season") to foul and purulent. Closed cervix pyometras can be a diagnostic problem, but the animals are often much more ill. Other signs may be polyuria and polydipsia, vomiting, lethargy, anorexia. This is a common time for susceptible bitches to become diabetic, and this is not reversed by treating the underlying pyometra.

First Aid- Fluids. Kidney function is impaired by bacterial toxins.

c/ Polyps and prolapses The floor of the vagina enlarges during oestrus, and this can be so marked that a polyp like structure appears through the lips of the vulva. This can cause straining, and the polyp itself can be so large as to be traumatised by the environment. Straining can also allow the vagina to prolapse, in which the tube of the vagina everts through the vulva. The emergency arises if urination is prevented or if the protruding tissue is damaged.

First Aid- Keep moist, pressure and cold compresses. Prolapse of the vagina is rare, but vaginal polyps are relatively common, and because they are enlarged tissue, they cannot usually be replaced. The tissue can be removed surgically, or will subside after oestrus. Spaying is usually suggested as breeding is difficult in these animals.