Patient care report for feline patient with urethral obstruction

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Signalment

Species: Feline
Breed: Domestic Short Hair
Age: 3 years
Sex: Male neutered
Weight: 5 kg

History

The patient was presented with a history of frequent unproductive squatting in the litter tray for the last 48 hours, of food and vomiting, leading to collapse.

Patient assessment

On physical examination the patient was collapsed, tachycardic, hypothermic (36.8^{0}C), hypotensive and had pale mucous membranes with a delayed capillary refill time (CRT 2s). His bladder was large, hard and painful to palpate.

Initial interventions

A 23G intravenous catheter was placed in the right cephalic vein and intravenous fluid therapy (IVFT) initiated, using Hartmann's. Blood was taken from the jugular vein for complete blood count, serum biochemistry, blood gas analysis and to measure packed cell volume (PCV)/total solids (TS).

Further investigations

It was not possible to manually express the bladder so cystocentesis was performed using a 23G butterfly catheter for immediate relief of the pressure. The urine obtained was examined for crystals under the microscope, specific gravity and dipstick, as well as sent for culture to look for bacterial infection and sensitivity to antibiotics. Methadone (0.3 mg/kg IV) was administered as analgesia, followed by general anaesthesia induction with Alfaxan (0.2 mg/kg IV) and maintenance with isofurane while saline was injected into the urethra to break up any blockages or flush them back into the bladder. The bladder was lavaged and an indwelling urinary catheter, with a closed collection system, was placed for 2 days and then removed. Uroliths were not seen on lateral images of the urinary tract without contrast radiography.

Discussions of nursing interventions

Urethral obstruction is a medical emergency associated with metabolic acidosis, hyperkalaemia, hypocalcaemia and post renal azotaemia (Drobatz and Cole, 2008). Treatment focuses on analgesia, correcting perfusion, metabolic imbalances and relieving urethral obstruction (Drobatz and Cole, 2008). It was crucial that the hospital environment posed minimal stress on the patient and pheromones (Feliway Diffuser, Ceva) were used, as well as all other stressors removed, such as barking dogs and loud noises (Woolf, 2012).

Fluid therapy

The type of fluid and the rate it is given has to be carefully considered. IVFT was administered to: improve hypovolaemia; correct electrolyte imbalances and metabolic acidosis; and 'flush' the urinary tract of potential obstructions.

Improving initial hypovolaemia

On presentation the patient was experiencing cardiovascular collapse. There was no history of heart disease and there was no audible murmur. The bradycardia was thought to be associated with the hyperkalaemia. Two boluses of Hartmann's were ad-

Box 1. Fluid therapy plan

ministered at 20 ml/kg over 10 minutes. Heart rate, respiratory rate and effort and blood pressure were closely monitored during the fluid resuscitation for signs of overload. When peripheral pulses resumed and mucous membranes were pink with a capillary refill of 1 second the fluid rate was reduced to 10 ml/kg/hours (*"ÏØ í*).

Correcting electrolyte imbalances and metabolic acidosis

The reduction or cessation of the glomerular filtration rate (GFR) causes post-renal azotaemia, hyperkalaemia, hypocalcaemia and metabolic acidosis (Segev et al, 2011). Hypocalcaemia occurs as a result of calcium binding to the excess phosphorus in the blood, which would normally be excreted by the kidneys (Lee and Drobatz, 2003). Hyperkalaemia is also the product of reduced excretion of potassium by the kidneys (Lee and Drobatz, 2003).

Potassium builds up in the blood and has deleterious effects on cardiac muscle, which are evident by electrocardiogram (ECG) examination (Segev et al, 2011). Spiked T waves and wide QRS complexes are typical of hyperkalaemia (Matthews, 2011). An ECG was not used for this patient; however, on reflection it would have been beneficial to have carried this out, especially as the patient presented with bradycardia.

A balanced electrolyte solution, such as Hartmann's, contains sodium chloride, calcium and potassium as lactate. The amount of potassium in Hartmann's (5 mmol/l) has previously been thought to be detrimental to the hyperkalaemic patient and sodium chloride 0.9% has frequently been the fluid of choice (Drobatz

collection bag was weighed every 2 hours, enabling the volume of urine to be calculated. Ideally urine output is between 1–2 ml/kg/hour (Matthews, 2011), however the phenomenon of post-obstructive diuresis may cause volumes to exceed this. Reduced GFR and therefore tubular function results in excessive urine production (Francis et al, 2010). The fluid therapy plan incorporated measuring urine output and exceeding this rate with IVFT to avoid subsequent dehydration.

Initially urine will be darker than expected in a healthy patient due to haematuria from the stretching and inflammation of the bladder, as well as catheterisation attempts (Segev et al, 2011). This was considered when reading the urine dipstick because the colour distorted the interpretation of the readings.

Management of indwelling urinary catheter

Attentive management of indwelling urinary catheters is essential for the patient's wellbeing, especially as there are several complications typically associated with their use (Oosthuizen, 2011). Correct management requires knowledge of the potential problems, how to recognise the problem and how to avoid the problem occurring (Chandler et al, 2007) ("ÏØ ΰ).

On reflection, the potential risks associated with urinary catheters were acknowledged throughout the nursing of this patient. The urine collection system was handled in a strictly aseptic manner, including hand washing as per the World Health Organisation (WHO) guidelines (Allegranzi and Pittet, 2009) and the application of sterile gloves and a closed urinary system was used. A urinary tract infection (UTI) was not suspeg i ώ ی ̑ e pe ٩
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Box 2. Potential problems with indwelling urinary catheters

Urinary tract infection (UTI) can be caused as a direct result of introducing bacteria in to the bladder at the time of catheterisation (Sullivan et al, 2010). The risk is therefore increased with repeated catheterisation (Chandler et al, 2007). Daily urinalysis promoted early detection of UTIs and if suspected the catheter would have been removed immediately and the tip of the catheter sent for culture, although this can take 3 days to receive results (Matthews, 2011). Indicators may have been an altered pH, protein, white blood cells on the dipstick and/or bacteria seen under a microscope. Prophylactic use of antibiotics is not recommended (Segev et al, 2011) and the application of aseptic technique when handling the urinary drainage system is paramount to minimising the occurrence of UTI's (Choong et al, 2001).

Cystitis is often associated with urinary catheterisation, especially male cats with very narrow urethras (Chandler, et al 2007). The patient frequently visited his litter tray and squatted as if he wanted to urinate while the catheter was in place, however this resolved once it was removed.

Blockage of the catheter is particularly relevant for cats that have obstructed initially due to urethral plugs or uroliths (Segev et al, 2011). Urine out-put may reduce and eventually cease to flow. This can be distinguished from oliguria by palpation of an increasing sized bladder as well as performing an ultrasound to ensure the tip of the catheter is positioned in the bladder. It is not recommended to flush the patient's catheter unless a blockage is suspected due to the increased risk of UTI.

Self removal of the catheter is undesirable due to the potential for re-obstruction, trauma to the urethra and the associated risks with re-catheterisation. A buster collar was worn by the patient at all times to avoid interference and it was ensured that the tubing of the closed urinary drainage system was not restrictive to the patient, for example, it was not caught in the kennel door.

Urethral damage is particularly applicable in male cats because of the narrow urethra (Corgozinho et al, 2007). Care must be taken to gradually advance urinary catheters, particularly when passing the ischial curve (Chandler et al, 2007). Damage can manifest from inflammation asa small amount of bleeding, to urethral rupture and uroabdomen (Corgozinho et al, 2007). The patient was monitored for signs of deterioration, but this was not applicable to him.

Table 1. Nursing care plan for feline patient post-urethral obstruction

Ability	Potential problem	Short-term goal	Nursing interventions	Monitoring
Eat adequate amounts	Anorexia Vomiting	Maintain RER (30 x 5kg)+70 = 220kcal Cease vomiting episodes	Once anti-emetic taken effect, offer prescription lower urinary diet, but remove if not eaten within 20 mins. Could try other	

Key points

Feline urethral obstruction can causes serious metabolic derangements, requiring urgent attention.

The most signi□cant electrolyte disturbance is hyperkalaemia, which if l5causes