CASE REPORT

Surgical Management of Ureteral Calculi in a Female Cat

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Ureters in cats have a small internal diameter (0.3-0.4 mm), thus predisposing to intraluminal obstruction. Calcium oxalate uroliths are more commonly seen in middle-aged to older cats (Cannon *et al.,* 2007). Upper urinary tract stones can be seen in cats of any breed. Calcium oxalate urolithiasis can be commonly seen in Persian, Himalayan, and Burmese breeds. Treatment options include medical management (MM), surgery, and interventional treatment (Adams *et al.,* 2017). Medical management consists of fluid therapy, ureteral muscle relaxants (e.g., alpha-1 adrenergic antagonists such as prazosin), analgesia, diuretics (e.g., mannitol, furosemide), and corticosteroids (Lekcharoensuk *et al.,* 2005). Surgical removal of ureteroliths is achieved by ureterotomy, ureteroneocystostomy, or pyelolithotomy and carries considerable risks. The exact procedure chosen depends on the location of the ureterolith (Hardie and Kyles, 2004). The most common postoperative complications are urine leakage and persistent ureteral obstruction after surgery. The present case report presents the diagnosis and management of ureteral calculi in a cat.

Case History and Observations

One year old female Persian cat was presented at the Veterinary Clinical Complex, SKUAST-K (Srinagar, Kashmir, India) with the chief complaint of stranguria and dribbling of urine. At presentation, signalment, and physiological parameters were recorded. All the parameters were in normal reference range. The cat was already treated medically by local vets with no improvement. Abdominal radiography followed by an ultrasonogram was carried out and it was diagnosed that the calculus was present in distal right ureter with mild hydronephrosis (Fig. 1, 2). Haematological and biochemical tests were within normal range and therefore surgical intervention was decided.

Treatment and Discussion

Surgery was performed under general anaesthesia after premedication with xylazine (0.5 mg/kg) and ketamine (@ 5mg/kg) IM and induction with propofol IV (2 mg /kg) till effect and maintained with Isoflurane (bains system). Mid line incision was put and right ureter was explored. On exploration, obstructive lesion was appreciated in the distal right ureter. Cystotomy was performed and the calculus was grasped and retrieved with the help of mosquito forceps passed through the distal ureter (Fig. 3). The bladder incision was closed with interrupted sutures with PDS 4-0. Abdominal incision was closed in a three-layer pattern. The stone was retrieved and analysed, which came as struvite type of calculus. Post- operatively amoxicillin sulbactam antibiotics for five days and butorphanol for three days was prescribed. The cat recovered uneventfully and was followed for next six months telephonically.

Cats with ureteral obstruction usually have signs of anorexia, lethargy, and vomiting as a consequence of acute uremia and abdominal pain, vocalization, haematuria, and pollakiuria, while as cats with unilateral partial obstruction and good functioning of the second kidney can be asymptomatic as was observed in the present case (Palm and Culp, 2016). Ureteral calculi in cats are being diagnosed with increasing frequency (McLouglin and Bjorling, 2003). Kyles *et al.* (2005b) diagnosed ureteral calculi on radiographs in 81% of cats, using ultrasound in 77% of cats, and in 90% of cases with both modalities.

The peak incidence of struvite in cats have been observed in 2 to 7 years and in the present case the age of the cat was 26 months and female cats have been at more risk of developing the struvite calculi (Forrester *et al.,* 2010). In the present case, the stone was struvite type calculi and it has

been observed that approximately 45% of uroliths consist entirely or predominantly of struvite (Forrester *et al.*, 2010). Medical management alone has been effective in a minority of cats with stone disease and if medical management is not successful in relieving the obstruction within 48-72 h, then more aggressive interventions should be considered in order to avoid excessive loss of renal function (Berent, 2011). Ureteral calculus in the present case was removed surgically as the ureter was partially obstructed (Kyles *et al.,* 1998). It has been observed that survival rates of the cats that had intervention performed were higher when compared with those treated with medical management alone (Kyles *et al.,* 2005a).

Fig. 1: Radiopaque calculi in ureter

Fig. 2: Hyperechoic calculi in distal ureter in USG

In the present case renal function was preserved as the ureteral obstruction was relieved within days of onset, moreover animals might be at risk of developing obstruction in the opposite ureter or kidney (Hardie and Kyles, 2004). Post operative complications in the present case were not observed as has been usually associated with surgical intervention (Kyles *et al.,* 2005a). Struvite dissolution diet was prescribed for the prevention of further development of struvite calculi as no recurrence was observed for next six months (Lulich *et al.,* 2013).

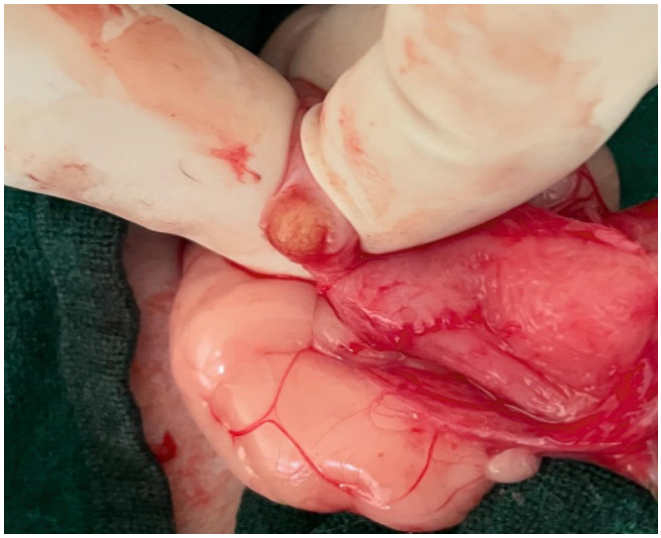

Fig. 3: Calculi removed

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