

Case Report Rapport de cas

Urethral intussusception following traumatic catheterization in a male cat

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Abstract – An 8-year-old, European male shorthair cat was presented with lower urinary tract obstruction. He was catheterized and referred. Retrograde cysto-urethrography suggested a urethral mass. Intussusception of the urethra with a partial rupture of the urethra was visualized. A perineal urethrostomy was performed. The cat was clinically normal at 15 months' follow-up.

Résumé – **Invagination urétrale secondaire à un cathétérisme traumatique chez un chat mâle.** Un chat européen male de 8 ans présentant des signes d'obstruction du bas appareil urinaire a été cathétérisé et référé. L'urétrographie rétrograde suggérait une masse urétrale. Une intussusception de l'urètre avec une rupture partielle de l'urètre a été visualisée. Une urétrostomie périnéale a été réalisée. Le chat était cliniquement normal 15 mois après l'intervention.

(Traduit par les auteurs)

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Feline lower urinary tract diseases (FLUTD) are common conditions in cats. Obstruction is reported in 28.6% to 58% of cases (1–2) and re-obstruction occurs in 22% to 45% within 6 mo (3–4). Almost exclusively male cats are reported, due to their relatively long and narrow urethra (4). Differential diagnoses for urethral obstruction in cats include urolithiasis, urinary tract infection, idiopathic diseases, neoplasia, urethral stricture, anatomic malformations, and foreign bodies (4). Urethral injuries may result from pelvic fractures, vehicular trauma, urethral calculi, gunshot trauma, bite wounds, or urethral catheterization (5). In case of failure in medical treatment, perineal urethrostomy is the most commonly preferred surgical procedure to relieve the obstruction (6).

Case description

An 8-year-old, European shorthair castrated male cat weighing 4.2 kg was referred for lower urinary tract obstruction. Two years previously the cat had a first episode of stranguria and pollakiuria. At that time, the referring veterinarian performed a cystotomy to remove cystic calculi diagnosed on abdominal radiographs. No analysis of the calculi was done. During that period, the cat had 2 additional episodes of FLUTD, which were treated conservatively. Before referral, the cat was presented to the referring veterinarian for anuria. Urethral obstruction was

relieved by catheterization to overcome resistance 3 cm cranial to the external urethral opening of the penis. Contrast radiographs showed no abnormalities. Urinalysis revealed struvite crystalluria and the presence of *Escherichia coli* urinary tract infection. The cat received a single injection of cefovecin (Convenia; Pfizer Animal Health, Zaventem, Belgium), 8 mg/kg body weight (BW), SC, and prednisolone (Prednisolone 2.5%; V.M.D., Arendonk, Belgium), 0.5 mg/kg BW, SC. The urinary catheter was removed after 24 h. Three days later, urethral catheterization was repeated because of a new episode of obstruction and the catheter was left *in situ*. The cat was then referred for further investigation.

At presentation, the cat was alert and physical examination revealed no abnormalities except a grade 3/6 left parasternal heart murmur. Complete blood cell count and serum biochemistry results were within normal limits. Urinalysis revealed hematuria, proteinuria, specific gravity of 1.032, pH of 6, and bacteriuria. Cytology revealed neutrophils, red blood cells, and intracellular bacteria. Bacterial culture was positive for *Enterococcus faecalis* which was susceptible to all tested antibiotics. An echocardiography was performed revealing thickening of the left ventricular wall with a left atrium within normal limits. No contraindication for anesthesia was identified. Under sedation, a smooth urethral mass was identified by rectal palpation 3 cm cranial to the anus. On abdominal radiographs and ultrasonography (Figure 1), calculi/crystals were present in the bladder and the urethra. A thickened bladder wall consistent with cystitis and a bilateral moderate pyelectasia were present. A hypoechoic, asymmetrical circumferential thickening of the urethral wall was visible using a perineal approach. A focal ampullar dilation of the pelvic urethra (Figure 2) on positive retrograde cysto-urethrography was highly suggestive of an asymmetric circumferential urethral intramural lesion. The

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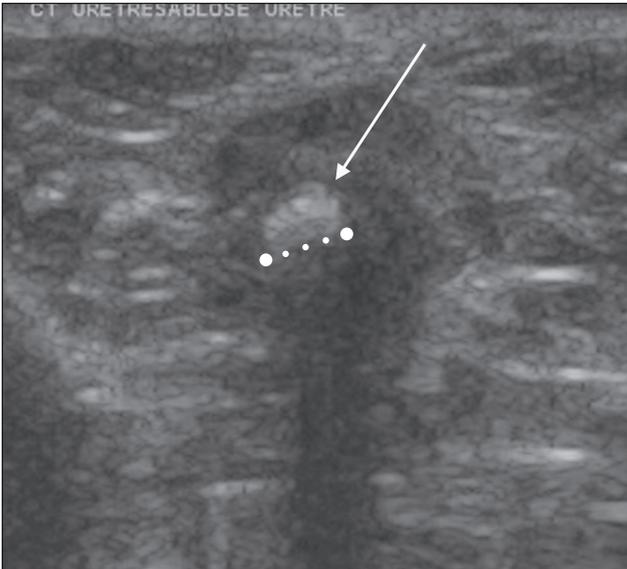


Figure 1. Transverse ultrasonographic image of the caudal urethra (perineal approach). Hypoechoic circumferential thickening of the urethra is more severe dorsally within a poorly delineated hyperechoic image visible dorsally. Note the hyperechoic convex surface of the crystals in the urethra (white arrow) creating a strong acoustic shadow.



Figure 2. Lateral radiographic view of the retrograde urethrography. There is a focal, ampullar enlargement of the urethra with 2 tubular filling defects (arrow) inside, 1 (larger) in continuity with the dorsal wall and 1 (thinner) with the ventral wall with secondary narrowing of the urethral lumen. An asymmetric circumferential urethral intramural lesion is suspected.

differential diagnosis was an intramural tumor, or less likely, another intramural lesion. Transrectal ultrasound-guided fine-needle aspiration of the mass revealed polymorphonuclear cells with intracellular bacteria and no signs of malignancy. Thoracic radiographs revealed no sign of pulmonary metastasis. A surgical approach *via* a perineal urethrostomy was planned in order to relieve the obstruction and resect the suspected mass.

The cat was anesthetized and placed in ventral recumbency. The perineal region was clipped and prepared for surgery. Urethral catheterization was easily performed but no urine came through the catheter. An elliptical incision was made around the scrotum and the prepuce, and the penis was freed from the surrounding tissues. The dissection was extended

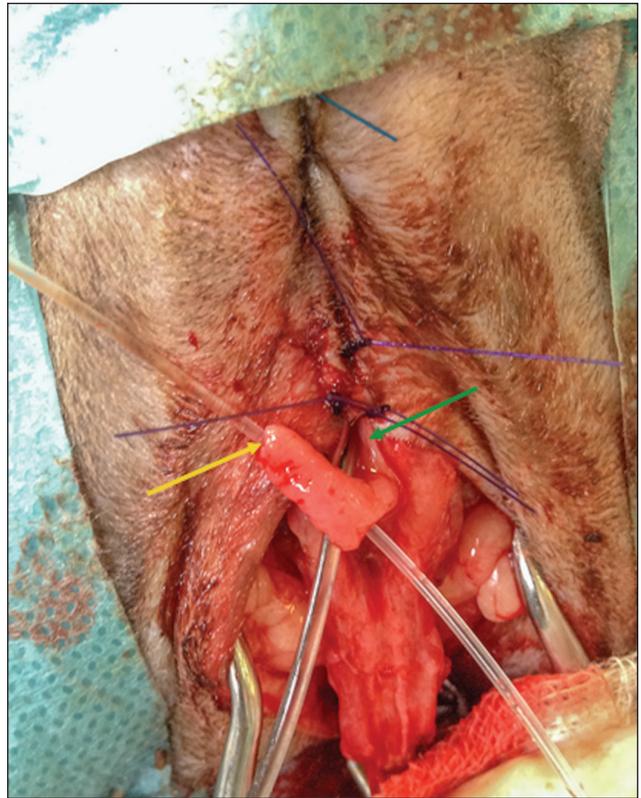


Figure 3. First catheter placed within the penile disrupted urethra (yellow arrow) and second within the remnant pelvic part of the urethra (green arrow).

toward the penile attachments at the ischial arch, the ventral penile ligament was severed, and the ischiocavernosus and ischiourethralis muscles were transected. Once the suspected urethral mass was reached, intussusception of the urethra with complete disruption between urethra and corpus cavernosum of the penile part of the urethra, and partial rupture of the urethra at the site of intussusception were visualized. A second urethral catheter was placed within the remnant pelvic portion of the urethra (Figure 3). After removal of the caudal part of the urethra and penis, the perineal urethrostomy was continued as previously described (7–8). Postoperative analgesia was provided with buprenorphine (Vetergesic; Alstoe Animal Health, Sheriff Hutton, York, UK), 0.015 mg/kg BW, IV, q6h. Several calculi were collected during the procedure and sent for analysis. The quantitative analysis of the uroliths (Minnesota Urolith Center, Saint Paul, Minnesota, USA) determined that they were 100% calcium oxalate monohydrate.

Following recovery from anesthesia, the cat urinated normally 4 h after surgery. The cat was discharged the day after surgery and received amoxicillin-clavulanic acid (Synulox; Pfizer Animal Health), 20 mg/kg BW, PO, q12h for 15 d and meloxicam (Metacam; Boehringer-Ingelheim), 0.1 mg/kg BW, PO, q24h for 3 d. At recheck, 3 wk after surgery, the cat was doing well. The owners reported normal urination and no sign of stranguria, hematuria, or dysuria. Three weeks after surgery, urinalysis was within normal limits, stitches were removed and the cat was released to normal activity. At 15 mo after surgery the cat was clinically normal, without any urinary problems.

Discussion

Although urethral catheterization has been reported to be a potential cause of urethral rupture, to the authors' knowledge, this is the first report in veterinary medicine of urethral intussusception following traumatic catheterization. Urethral obstruction is a common disease in cats. Urethral plug, uroliths, and idiopathic causes are the most common etiologies. Medical management of urethral obstruction requires correction of electrolyte abnormalities, restoration of tissue perfusion, analgesia for visceral pain, and release of the urethral obstruction (9). The medical management may include urethral catheterization to relieve the obstruction. The urinary catheter is usually left in place for 24 to 48 h (10).

Urinary calculi as well as urethral catheterization to dislodge the calculi can cause damage to any portion of the urethra, but iatrogenic injuries are commonly in the penile portion and at the level of the ischial arch (11). In a previous retrospective study on 29 cats managed for urethral rupture, urethral obstruction and catheterization was found to be the cause of the injury in 23 cats (11). Urethral trauma and bladder rupture following catheterization can cause uroperitoneum in cats (12). In another study, all 15 cats undergoing perineal urethrostomy had urethral trauma attributed to prior catheterization (13). In order to avoid urethral trauma by catheterization, it is recommended that sedation and analgesia be used. Some authors advocate decompression of the bladder by cystocentesis (9,14–16); there was no bladder rupture associated with the procedure in 47 cats (9). The goal is to relieve the pressure in the bladder, ureters, and kidneys, to decrease pain, and provide time for stabilization of the patient (15,16). Catheterization may facilitate retropulsion of urethral plugs or uroliths. It should be noted that the urinary catheter is only used to perform hydropropulsion and not to mechanically relieve the obstruction (13). However, successful treatment of 11 out of 15 male cats with urethral obstruction managed without urethral catheterization has been reported (17).

Survey radiographs are useful to identify radiopaque urethral calculi, abnormal urethral location, or concurrent pathology causing urethral obstruction. Positive-contrast retrograde urethrocytography is the imaging modality of choice for evaluation of urethral lesions (18). Ultrasonography is reported to be of value but is limited to the extrapelvic region (19). Computed tomographic and magnetic resonance imaging have yet to be proven to be of any clinical use in animals with urethral disorders (8). In our case, ultrasonography and retrograde cystourethrography lead to a suspicion of a urethral tumor. Moreover, cytology failed to establish a diagnosis and thoracic radiographs revealed no lung metastasis. However, the localization of the lesion allowed a perineal approach for resection of the mass. The cat in our report was successfully treated with a perineal urethrostomy. The cat was discharged 24 h after surgery and was clinically normal 15 mo later.

This is the first report in veterinary medicine of urethral intussusception associated with a rupture following traumatic catheterization. When a cat is presented for FLUTD, care must be taken during urethral catheterization. More importantly, urethral intussusception can create an asymmetric circumferential intramural lesion on abdominal ultrasonography and retrograde urethrocytography. This should be taken into account in the differential diagnoses of a urethral mass in a cat following urethral catheterization.

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