



## NOTE

Surgery

# Urethral prolapse corrected by microsurgery in a cat: a case report

Luciana Gonçalves TEIXEIRA<sup>1)\*</sup>, Michelli Westphal de ATAÍDE<sup>1)</sup>,  
Vanessa MILECH<sup>1)</sup>, Felipe Baldissarella GAVIOLI<sup>1)</sup>,  
Bernardo Nascimento ANTUNES<sup>2)</sup>, Stephanie Lanzarini ABATI<sup>2)</sup>,  
Saulo Tadeu Lemos PINTO FILHO<sup>3)</sup> and Mauricio Veloso BRUN<sup>4)</sup>

<sup>1)</sup>Graduate Program of Veterinary Medicine, University Veterinary Hospital, Universidade Federal de Santa Maria, Avenida Roraima, 1000, 97195-000, Santa Maria, Rio Grande do Sul, Brazil

<sup>2)</sup>College of Veterinary Medicine, Universidade Federal de Santa Maria, Avenida Roraima, 1000, 97195-000, Santa Maria, Rio Grande do Sul, Brazil

<sup>3)</sup>Department of Small Animal Clinics, Universidade Federal de Santa Maria, Avenida Roraima, 1000, 97195-000, Santa Maria, Rio Grande do Sul, Brazil

<sup>4)</sup>CNPq-Brasil fellowship (308019/2015-6; 200346/2017-2), Universidade Federal de Santa Maria, Avenida Roraima, 1000, 97195-000, Santa Maria, Rio Grande do Sul, Brazil

*J. Vet. Med. Sci.*

79(12): 2023–2025, 2017

doi: 10.1292/jvms.17-0280

Received: 24 May 2017

Accepted: 15 October 2017

Published online in J-STAGE:

31 October 2017

**ABSTRACT.** Urethral prolapse is a rare condition in dogs and cats. A 7-month-old male cat presented with intermittent penile bleeding and a red mass protruding from the tip of the penis. Urethral prolapse was diagnosed by using a surgical microcamera to examine the genital area. Urethroplasty and preputial advancement surgery were performed using a surgical microscope, to successfully correct the urethral prolapse.

**KEY WORDS:** cat, microsurgery, penile bleeding, urethral prolapse

Urethral prolapse in cats is an uncommon occurrence. A few reports have described cases in dogs, primarily in brachycephalic and Yorkshire terrier breeds due to urinary infections and calculi, developmental abnormalities, and excessive sexual behavior [3, 4, 8]. This pathology is characterized by intermittent penile bleeding, a reddened, protruding tip of the penis, dysuria, and pollakiuria. Extrusion of the penis and examination of the urethral orifice are necessary for differential diagnosis, which includes urethral calculi and/or stricture [2]. However, due to the size of this structure in cats, visualization of the urethral orifice without any equipment is difficult. Treatment includes urethral mucosal reduction, urethral mucosal resection, and anastomosis or urethropexy [1, 3–7].

Urethral prolapse is rare in small animals and has been described infrequently in the literature. It is believed that this condition is rarer in cats, and to our knowledge there is no case in the existing literature of urethral prolapse in cats corrected by urethroplasty using microsurgery. The aim of this work was to report the occurrence of a urethral prolapse in a cat diagnosed using enlarged images obtained with a surgical microcamera, and successfully corrected by microsurgical urethroplasty associated with preputial advancement surgery.

A 7-month-old male domestic shorthair cat weighing 4 kg was presented to the Universidade Federal de Santa Maria Veterinary Hospital (HVU-UFSM). The primary complaint of the owner was intermittent anal and penile bleeding over approximately 6 months. The owner related that the cat had undergone previous treatment for endoparasites by another veterinarian and received a prescription for antibiotics and vitamin K. At the appointment, anal and preputial bleeding were noticed, as was hyperemic mucous. The animal was referred for an ultrasound and contrast retrograde urography, total blood count, and serum biochemistry. None of the exams revealed any alterations. Seven days later, the cat was brought to the HVU-UFSM due to difficulty exposing the penis and bleeding in the anal and genital areas. The owner had observed more frequent visits to the litterbox in attempt to urinate. Urethral catheterization was performed to collect urine for urinalysis, and post-procedure worsening of dysuria and pollakiuria were observed. The cat was then referred to a minimally invasive surgery service of the hospital (SOMIV-UFSM, Veterinary Minimally Invasive Solutions) for specialized evaluation of the mucous and glans penis.

The genital and preputial areas were examined using a microcamera associated with a flexible endoscope 9.8 mm in diameter with LED lighting (Tele Pack™ system, Karl Storz, Karl Storz, Tuttlingen, Germany), under general anesthesia, with intravenous propofol (Propovan, 4 mg/kg BW, body weight; Cristália, Itapira, Brazil) and isoflurane through a face-mask. During this

\*Correspondence to: Teixeira, L. G.: [lucianateixeira@gmail.com](mailto:lucianateixeira@gmail.com)

©2017 The Japanese Society of Veterinary Science



This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives (by-nc-nd) License. (CC-BY-NC-ND 4.0: <https://creativecommons.org/licenses/by-nc-nd/4.0/>)

procedure, a red mass was observed protruding from the glans and was identified as the inflamed mucosal portion of the prolapsed urethra; preputial edema with exposure of the prolapsed portion was also observed (Fig. 1). The animal was sent to the SOMIV-UFSM for microsurgery 5 days later.

The cat was pre-medicated with a combination of acepromazine (Acepran, 0.06 mg/kg BW; Syntec, Brazil) and pethidine (Dolosal, 3 mg/kg; Cristália). After 20 min, both cephalic veins were catheterized and the genital and lumbar hair was clipped. After induction of anesthesia with propofol (Propovan, 4 mg/kg BW; Cristália), intubation, and stabilization of the anesthetic plane, the blockade site was antiseptically prepared. An epidural blockade was performed using a 20-G Tuohy needle to inject 2 mg/kg BW of lidocaine (Lidocaine hydrochloride; Cristália) and 0.1 mg/kg BW of morphine (Dimorf; Cristália). Anesthesia was maintained with isoflurane using a non-rebreathing system. Cephalothin (30 mg/kg BW; Cristália) and dipyrone (25 mg/kg BW; Ibasas, Porto Alegre, Brazil) were administered prior to surgery.

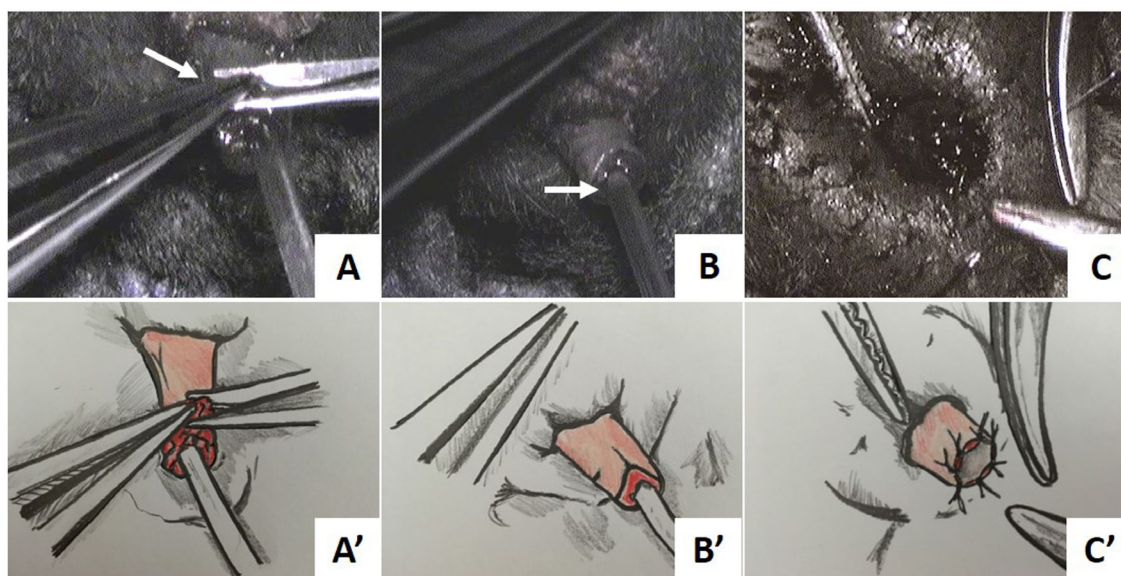
A surgical microscope at  $\times 10$  magnification was used during surgery.

The prolapsed mucosal portion of the urethra and its junction with the glans were sectioned using scissors, promoting apposition suturing between the border of the glans and the remaining urethra in a simple interrupted pattern with 7-0 polypropylene (Bioline, Anápolis, Brazil). During suturing of the urethral mucosa, the urethra remained catheterized with a 24-G catheter. The resection of the prolapsed tissue did not promote significant distance between the mucous membranes of the urethra and the glans, allowing application of the apposition sutures without the need to fix the mucous membranes. The catheter was important to adequately cover the urethra during suturing (Fig. 2A–C). Once urethroplasty had been performed on the entire urethral circumference, orchietomy was performed using the classic three-clamp technique. Preputial advancement was performed to avoid urethral exposure. For preputial advancement, an inverted, V-shaped incision was performed near the base of the foreskin. The wound created was sutured in an inverted “Y” shape with 5-0 nylon (Shalon, Goiânia, Brazil) in a simple interrupted pattern.

All parameters evaluated, including heart rate; respiratory rate; systolic, diastolic, and mean arterial pressure; and blood oxygen saturation level (SpO<sub>2</sub>) remained stable during surgery. Meloxicam (Maxicam, 0.2 mg/kg BW; Vetnil, Brazil) was administered postoperatively. The surgery lasted 120 min. The cat was discharged to the owner’s home after complete recovery from anesthesia, with a prescription for tramadol (Tramadol, 4 mg/kg BW; Cristália) orally every 8 hr for 5 days, and postsurgical care. A follow-up appointment 12 days after surgery was scheduled to remove the sutures and evaluate the outcome. At that time, the owner related



**Fig. 1.** Image obtained by the surgical microcamera integrated with the Tele Pack™ system. A red, bleeding, emaciated mass and inflamed mucosa protruding from the tip of the penis are visible.



**Fig. 2.** Images and illustrations demonstrating important surgical steps. (A and A') Resection of the prolapsed tissue by microsurgery. The arrow indicates the sectioning of the prolapsed mucosal portion of the urethra and its junction with the glans; sectioning was performed with scissors. (B and B') The glans after a 360-degree resection of the prolapsed tissue. The arrow indicates the catheterized urethra, which allowed the urethra to be covered during suturing. (C and C') The tip of the glans after insertion of apposition sutures.

that the cat was recovering from surgery and had no difficulties urinating. Adequate healing of the surgical wound and no penile bleeding, other than edematization at the extremity of the glans, were observed in the postoperative period. The urethral sutures were removed and the animal was discharged with meloxicam (Maxicam, 0.1 mg/kg BW) to be administered orally every 24 hr for 2 days. The patient was followed for six months after surgery, and no clinical signs associated with the disease were observed.

Multifactorial causes, in which heredity and genetic predisposition play major roles, are considered to be the origin of this disease [3]. The cat described in this work was young, non-neutered, and had no history of dysuria before the appearance of penile bleeding, which was likely due to the prolapsed urethra. No images compatible with vesical calculi were observed on ultrasonography. Still, no clinical signs or biochemical and hematological evidence of chronic disease during penile bleeding were observed. On histopathological examination, no reference tissue was identified. Hemorrhagic areas and granulation tissue were observed, probably due to the chronic urethral prolapse that lasted approximately 6 months. No underlying cause of this case could be determined. The diagnosis was clinical and based on physical examination as described in the literature [2, 4, 7], but used a microcamera to obtain enlarged images because the prolapsed structure was very small.

The method of correction depends on the association of the prolapsed urethra with the clinical signs. However, recurrence of urethral prolapse without a determined underlying cause is seen in 57% of dogs that undergo the surgery [3]. Surgery can also be followed by postoperative complications, such as total or partial urethral obstruction and mild or severe penile hemorrhage, which can be minimized using a simple continuous pattern for urethral anastomosis that decreases tissue irritation [6]. The cat underwent surgery due to long-lasting intermittent bleeding, pain accompanied by dysuria, and the prolapse of a large portion of the urethra. The technique of choice was resection and anastomosis, which is the most common treatment for dogs with this condition [3, 8]. A surgical microscope was used to perform the technique as accurately as possible, as the penile tip and prolapsed urethra are very small in cats. As recommended, castration was performed to avoid sexual behavior, which is associated with a risk of recurrence. No postoperative complications including hemorrhage, were observed after the procedure despite the use of single interrupted sutures.

This work presents the cat as another species, in addition to dogs and humans, which may experience urethral prolapse. This report shows how the utilization of a surgical microcamera and a surgical microscope can be extremely useful for the diagnosis and treatment of this condition in cats.

## REFERENCES

1. Bartges, J. W. and Callens, A. J. 2015. Congenital diseases of the lower urinary tract. *Vet. Clin. North Am. Small Anim. Pract.* **45**: 703–719. [[Medline](#)] [[CrossRef](#)]
2. Birchard, S. J. 1998. Surgical treatment of urethral prolapse in male dogs. pp. 475–477. *In: Current Techniques in Small Animal Surgery*, 4th ed. (Borjrab, M. J., Waldron, D. R. and Toombs, J. P. eds.), Williams & Wilkins, Baltimore.
3. Carr, J. G., Tobias, K. M. and Smith, L. 2014. Urethral prolapse in dogs: a retrospective study. *Vet. Surg.* **43**: 574–580. [[Medline](#)] [[CrossRef](#)]
4. Fossum, T. W. 2013. Surgery of the bladder and urethra. pp. 765–767. *In: Small Animal Surgery Textbook*, 4th ed. (Fossum T. W. ed.), Elsevier Health Sciences, St. Louis.
5. Kirsch, J. A., Hauptman, J. G. and Walshaw, R. 2002. A urethropexy technique for surgical treatment of urethral prolapse in the male dog. *J. Am. Anim. Hosp. Assoc.* **38**: 381–384. [[Medline](#)] [[CrossRef](#)]
6. Osborne, C. A. 2006. How would you manage a prolapsed urethra in an English Bulldog? *DVM Newsmag* **37**: 54.
7. Pavletic, M. M. and O’Bell, S. A. 2007. Subtotal penile amputation and preputial urethrostomy in a dog. *J. Am. Vet. Med. Assoc.* **230**: 375–377. [[Medline](#)] [[CrossRef](#)]
8. Ragni, R. A. 2007. Urethral prolapse in three male Yorkshire terriers. *J. Small Anim. Pract.* **48**: 180. [[Medline](#)] [[CrossRef](#)]