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Surgical management of urethral obstruction in tomcats using percutaneous pigtail catheter cystostomy

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Abstract

Feline urethral obstruction (UO) is the most common emergency condition in feline practice, requiring timely urinary diversion to prevent severe metabolic complications. This study assessed percutaneous cystostomy using a 6 F pigtail catheter as a minimally invasive surgical option in six tomcats with complete UO, where transurethral catheterisation was unsuccessful. Urethral patency was restored within a mean of 8.5 ± 1.9 days, and catheter removal occurred at a mean of 10.4 ± 4.9 days, with uneventful recovery in all cases. The procedure was well tolerated, required minimal anaesthetic exposure, and proved effective compared to more invasive surgical options. Percutaneous pigtail catheter cystostomy thus represents a valuable technique for managing feline UO, combining clinical efficacy with reduced morbidity, compared to more invasive procedures.

Keywords: Pigtail catheter, percutaneous cystostomy, feline urethral obstruction

Introduction

Feline urethral obstruction (UO) accounts for approximately 4.6% of all feline emergency presentations (Hetrick & Davidow, 2013) [1]. It occurs with markedly greater frequency in male cats due to their long, narrow, and anatomically complex urethra, which predisposes them to obstruction by urethral plugs, crystals, or uroliths (Lekcharoensuk *et al.*, 2001) [3]. Young to middle-aged tomcats maintained predominantly on dry commercial diets and housed indoors with limited physical activity are considered at increased risk (Gerber *et al.*, 2005; Lew-Kojrys *et al.*, 2017) [5, 4]. Obstruction may arise secondary to urolithiasis, urethral plugs, strictures, or neoplasia, and these conditions are collectively classified under Feline Lower Urinary Tract Disease (FLUTD) (Gerber *et al.*, 2005) [5]. Clinically, affected cats typically present with oliguria or anuria and require immediate intervention. Urinary diversion is critical to prevent life-threatening metabolic disturbances and preserve renal function. Several interventional options are available, such as cystocentesis, transurethral catheterisation, tube cystostomy, and perineal urethrostomy, with advantages and disadvantages (Nurra *et al.*, 2022) [6]. Percutaneous cystostomy using a pigtail catheter has emerged as a minimally invasive and effective alternative for temporary urinary diversion in cats with UO, when retrograde catheterisation is unsuccessful or contraindicated (Nurra *et al.*, 2022) [6].

Materials and Methods

The study was conducted on six clinical cases of tomcats presented to the Department of Veterinary Surgery and Radiology, Veterinary College, Bengaluru. Cases of feline urethral obstruction were included irrespective of age or breed. The signalment and anamnesis of the cases under study are presented in Tables 1 and 2.

Instrumentation

The materials used for percutaneous cystostomy were a Pigtail catheter kit, which include Pigtail catheter (6 Fr, 22 cm), trocar and sharp stylet (Fig 1&2)

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Fig 1: Pigtail catheter kit: a) Pigtail catheter with straightener, b) Trocar, c) Stylet



Fig 2: Assembled Pigtail catheter

Table 1: The details of the tom cats selected for the study

Cat No.	Age (Years)	Breed	Castrated or Intact	Body weight (Kg)	Indoor or Outdoor	Single or multi-cat household
I	3	Domestic short hair	Intact	3	Outdoor	Multiple
II	3	Persian	Intact	4	Indoor	Multiple
III	6	Persian	Intact	3.7	Indoor	Single
IV	4	Persian	Intact	3.5	Indoor	Multiple
V	2.5	Persian	Intact	4.4	Indoor	Multiple
VI	3	Persian	Intact	4	Indoor	Multiple

Table 2: The history of the tom cats selected for the study

Cat No.	Duration of illness	Type of feed	Month of occurrence	Type of obstruction	First time occurrence/recurrence
I	3	Commercial dry food	March	Complete	Recurrence
II	6	Commercial dry food	April	Complete	Recurrence
III	4	Commercial dry food	April	Complete	Recurrence
IV	1.5	Commercial dry food	May	Complete	Recurrence
V	2.5	Commercial dry food	June	Complete	First time
VI	3	Commercial dry food	June	Complete	Recurrence

Pre-operative preparation of the patient

Selected cats were fasted for 12 hours for food and 6 hours for water before surgery. The ventral abdomen was clipped and aseptically prepared using 7.5% povidone iodine scrub, followed by surgical spirit and a final application of 5% povidone iodine, and covered with sterile surgical drapes. Premedication was administered with atropine sulphate at 0.04 mg/kg intramuscularly, 15 minutes before induction. Anaesthesia was induced and maintained with tiletamine-zolazepam (Zoletil®) at 10 mg/kg intramuscularly.

Surgical Procedure

The animals were positioned in dorsal recumbency with the hind limbs extended caudally. The distended urinary bladder was palpated and gently stabilised against the abdominal wall along the median raphe. A small stab incision was made at the midline of the caudal abdomen using a No. 11 BP blade, sufficient to permit insertion of a 6 Fr pigtail catheter. The catheter assembly with trocar and stylet was advanced percutaneously into the bladder using gentle pressure. Entry into the bladder was confirmed by urine

flow upon withdrawal of the stylet. The catheter was further advanced until the fenestrated pigtail segment was fully positioned within the bladder lumen, after which the locking mechanism was activated by removing the trocar. The skin incision was closed with nylon in a single cross-mattress pattern. The catheter was secured to the skin using a Chinese finger-trap suture with additional stay sutures to prevent tension and displacement. The site was protected with an elastic adhesive bandage.

Postoperative care and management

Postoperatively, all cats received ceftriaxone at 25 mg/kg intravenously and buprenorphine at 0.02 mg/kg intravenously, administered twice daily for five days. Fluid therapy with Ringer's lactate was provided at 10 mL/kg twice daily for five days. Subsequently, oral cefpodoxime proxetil was prescribed at 5 mg/kg twice daily. Cats were monitored until restoration of urethral patency on postoperative days 2, 4, 6, 8, 14, and 21, and the time required for the return of normal urine flow through the urethral orifice was recorded.

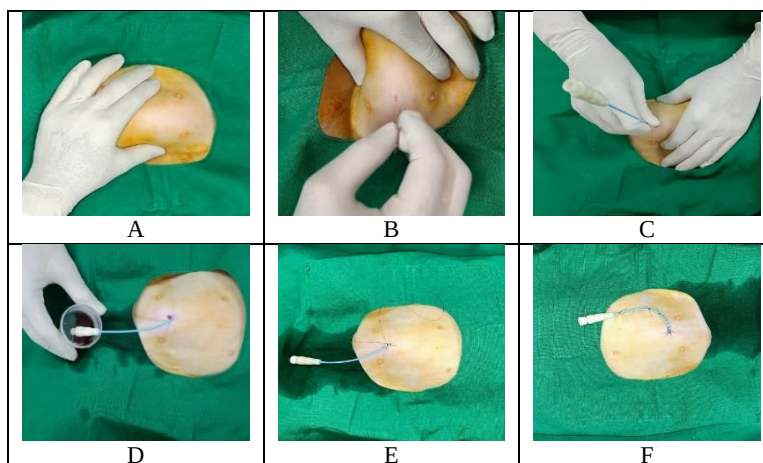


Fig 3: Surgical Procedure. A-Bladder localisation and positioning, B-Skin incision, C-Insertion of pigtail catheter into the bladder, D-Confirmation of pigtail catheter in the bladder, E-Skin closure, and F-Plate 12: Placement of the Chinese finger trap and stay sutures.

Results and Discussion

In the selected tom cats, urethral patency was re-established within a mean duration of 8.5 ± 1.9 days. Catheter removal was subsequently undertaken at a mean of 10.4 ± 4.9 days,

following confirmation of unobstructed urine flow through the urethra without evidence of straining, even after complete occlusion of the catheter

Table 3: Postoperative removal of pigtail catheter in tomcats

Case No	Time taken to regain urethral patency (days)	Pigtail catheter removal (days)
I	15	17
II	10	12
III	2	4
IV	11	13
V	9	11
VI	4	5



Fig 4: Catheter removal a) Cat with intact pigtail catheter, b) Clear urine flow, c) Catheter removed

Conclusion

Percutaneous cystostomy using a pigtail catheter offers a minimally invasive, well-tolerated method for direct bladder access, enabling effective urinary diversion and supporting urethral healing. Urethral patency was typically re-established within 10 days, with catheter removal followed by uneventful recovery. The technique required minimal use of anaesthetic drugs and proved particularly beneficial in compromised patients. By avoiding more invasive procedures such as conventional tube cystostomy, cystotomy, or perineal urethrostomy, this approach represents a valuable alternative that combines clinical efficacy with reduced patient morbidity.

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