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Short- and long-term outcomes and complications following feline perineal urethrostomy

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Abstract

Background: Perineal urethrostomy (PU) is a surgical procedure performed in male cats with recurrent urethral obstructions or irreversible urethral damage, creating a permanent urinary stoma. Although PU effectively relieves obstruction, it can lead to postoperative complications that affect feline quality of life. **Case description:** The present study assessed the short and long-term outcomes and complications following PU in 10 male cats treated at the Small Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. A retrospective review of the medical records was conducted for male cats diagnosed with feline lower urinary tract disease (FLUTD) and undergoing PU between October 2020 and January 2025. Data were collected from hospital records and owner questionnaires. Descriptive analysis of collected data was performed using appropriate tests. The study population consisted of 10 cats, 0.5-7 years of age and weighing between 1 and 5 kg, representing Domestic Shorthair (DSH), Persian, and Scottish breeds. **Findings/treatment and outcome:** PU was effective in managing FLUTD, with 9 out of 10 owners reporting satisfaction. Short and long-term complications were minimal, which supports the surgical efficacy. Short-term complications included cystitis, hematuria, polyuria, dysuria, urinary tract infection, dribbling, recurrent obstruction, urethral stricture, and urinary leakage. Long-term complications can involve: chronic urinary tract infections, recurrent strictures, and persistent incontinence or stranguria. Importantly, all procedures were performed in the colder months of the year, between October and March. Only two of the ten cats experienced recurrent urinary issues. All owners (100%) endorsed the surgery for similar cases. **Conclusion:** PU is an effective intervention for FLUTD in male cats, though findings should be interpreted cautiously due to the limited sample size and follow-up duration. These results support further research and provide evidence for the surgical management of FLUTD.

Key words: Feline lower urinary tract disease, Long-term outcome, Lower urinary tract symptoms, Perineal Urethrostomy, Short-term outcome

Introduction

The most common indication for perineal urethrostomy is recurrent urethral obstruction despite appropriate management of feline lower urinary tract disease (FLUTD) (Ettinger and Feldman, 2017; Nye and Luther, 2018; Nelson and Couto, 2020). FLUTD is an umbrella term used to describe any disorder affecting the bladder or urethra in cats. Clinical signs of FLUTD may include polyuria, stranguria, periuria, dysuria, and hematuria (Smith and Schiller, 1978; Ettinger and Feldman, 2017; Nye and Luther, 2018; Nelson and Couto, 2020).

Lower urinary tract symptoms (LUTS) are not specific to a single disease and may be observed in cats with bladder stones, bacterial urinary tract infections, or neoplasia (Nelson and Couto, 2020). The prevalence of

LUTS in domestic cats in the UK and the USA ranges from 0.6% to 6.4% based on veterinary data. Owner-reported data indicate that up to two-thirds of young cats (<10 years) presenting with LUTS are diagnosed with feline idiopathic cystitis (FIC). Cats presenting multiple times with FLUTD symptoms may have different underlying causes at each episode. Although FIC may present as obstructive or non-obstructive, urethral obstruction is considerably more common in male cats (Westropp and Buffington, 2004; Ettinger and Feldman, 2017; Johnston and Tobias, 2017; Fossum, 2019; Nelson and Couto, 2020). Risk factors for FIC include obesity, lack of physical activity, multi-cat households, improper litter box hygiene, and indoor confinement (Westropp and Buffington, 2004; Ettinger and Feldman, 2017; Nelson and Couto, 2020). Environmental stressors, such as conflicts with other cats at home, have also been

recognized as risk factors.

Urethrostomy refers to the creation of a permanent opening in the urethra. Recurrent or persistent urethral obstructions or irreversible damage to the site may necessitate forming a permanent urinary stoma via urethrostomy (Blake, 1968; Johnston and Tobias, 2018; Fossum, 2019; Slater *et al.*, 2020). Male cats are the typical candidates for this procedure (Blake, 1968; Johnston and Tobias, 2018; Fossum, 2019). Before surgery is considered, patients should undergo a thorough evaluation to rule out treatable underlying conditions (Johnston and Tobias, 2018; Fossum, 2019; Slater *et al.*, 2020). Common indications for PU include obstructions unresponsive to medical therapy, uroliths not removable by retrograde hydropulsion or urethrotomy, urethral strictures, penile or urethral trauma, and urethral neoplasia requiring penile amputation (Bass *et al.*, 2005; Johnston and Tobias, 2018; Fossum, 2019). While perineal urethrostomy is most commonly performed in feline patients, prepubic and subpubic urethrostomy techniques are also described. Perineal urethrostomy was first reported in 1963 as a treatment for urethral obstruction and trauma (Carbone, 1967; Johnston and Tobias, 2018). The Wilson and Harrison (1971) technique is the most widely used approach (Johnston and Tobias, 2018; Fossum, 2019).

PU can lead to short-term and long-term complications (Bass *et al.*, 2005; Johnston and Tobias, 2018; Watson *et al.*, 2020). Short-term complications occur within the first four weeks postoperatively, while long-term complications arise thereafter period (Johnston and Tobias, 2018; Sousa-Filho *et al.*, 2020; Watson *et al.*, 2020). Short-term issues may include urinary incontinence, cystitis, hematuria, dysuria, stranguria, LUTI, recurrent obstruction, urethral stricture, and urine leakage (Bass *et al.*, 2005; Ruda and Heiene, 2012; Johnston and Tobias, 2018; Sousa-Filho *et al.*, 2020). Long-term complications can involve chronic urinary tract infections, recurrent strictures and persistent incontinence or stranguria (Smith and Schiller, 1978; Ruda and Heiene, 2012; Johnston and Tobias, 2018; Sousa-Filho *et al.*, 2020). Despite these, most cats resume normal activity within two weeks postoperatively and do not require indwelling catheters (Johnston and Tobias, 2018).

The present retrospective study aimed to evaluate short- and long-term outcomes and complications

following perineal urethrostomy performed at the Small Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran.

Case description

The target population consisted of male cats diagnosed with lower urinary tract problems who underwent perineal urethrostomy (PU) surgery at the University of Tehran Veterinary Teaching Hospital between October 2020 and February 2025. Eligible cases included male cats of any age that had undergone PU surgery and for whom medical records and communication with their owners were accessible. All procedures were performed following the technique described by Wilson and Harrison (1971) and carried out by board-certified veterinary surgeons and faculty members of the University of Tehran.

Relevant demographic information—including age, sex, reason for referral, and duration of disease—was extracted. Owners were contacted by phone using the contact information provided in the medical records. A structured questionnaire was administered to gather information on the animal's current status, reportable clinical outcomes, short-term and long-term postoperative complications, and the owner's level of satisfaction using a three-point scale: excellent (no complications), good (some minor complications), and poor (serious complications or unsuccessful surgery).

Data analysis

The collected data were summarized and analyzed descriptively in the form of case reports using Microsoft Excel.

Findings/treatment and outcome

Medical record findings

Patient data were collected from the hospital's medical records database, identifying twenty-four cats that underwent PU surgery during the period. Fourteen cats were excluded due to incomplete medical reports, unwillingness of the pet owner to respond, or a change in contact number and unavailability. Finally, ten cats were included in this study. Descriptive information of these cats presented in Table 1.

Table 1: Descriptive information of the studied male cats

No.	Age	Weight (kg)	BCS	Breed	Alive/Dead	Short-term complications	Long-term complications	Owner satisfaction
1	2.5 years	NA	4	Persian	Alive	No	No	Excellent
2	3 years	4.5	5	Persian	Alive	No	No	Good
3	1-2 years	NA	4	DSH	-	-	-	-
4	NA	3	4	DSH	Dead	Yes	No	Good
5	6 years	3.5	4	DSH	Alive	No	No	Excellent
6	1-2 years	-	-	-	-	-	-	-
7	6 months	1	3	DSH	Dead	Yes	Yes	Poor
8	5 years	3.5	5	Scottish	Alive	No	No	Excellent
9	3.5 years	4	5	Scottish	Alive	No	No	Excellent
10	7 years	3.5	5	Persian	Alive	NA	NA	Excellent

Pre-surgery

All cats in this study were male. The median age was 3 years (ranging from 6 months to 7 years). The mean weight at the time of surgery was 2.3 kg, with a range of 1 kg to 4.5 kg. The median body condition score (BCS) was 4, ranging from 3 to 5 on a 9 point scale (Bjornvad *et al.*, 2011). The referred cats consisted of 4 Domestic Shorthair (DSH), 3 Scottish Fold, and 3 Persian cats. The medical records indicated failed medical management in all cases as the reason for proceeding with PU surgery. All of the surgeries were conducted during the colder months of the year, with one performed in October, one in November, three in December, four in January, and one in March.

Among the cats, one experienced pain during urination before surgery, four exhibited dribbling urination, two had urethral obstruction and inflammation, eight suffered from difficulty in urination, two showed hematuria, and two had urethral trauma. Dietary modifications were implemented in eight cats. In addition, fluid therapy was administered to these eight cats, and medical treatments (including diuretics, alpha-blockers and sedatives such as acepromazine) were provided as well. Catheterization was performed in seven of the cats.

Post-surgery

In the evaluation of short-term recovery, three of the 10 cat owners rated the recovery process as poor, two as good, and five as excellent. Six owners reported short-term postoperative complications. Changes in urinary habits (e.g., place and position of urination, behavior after urination, etc.) were reported by two of the owners. Urinary retention due to various causes was observed in two cats, while one exhibited signs of dysuria. No cases of increased urinary frequency were reported. Postoperative lower urinary tract infection (LUTI) occurred in two of the cats. Only one case of urinary incontinence was recorded, which was attributed to a spinal cord injury unrelated to lower urinary tract dysfunction. Two cats developed urinary tract infections, one experienced dysuria, and two showed urinary retention. The onset of short-term complications occurred within seven days postoperatively in two cases, within 14 days in one case, and in one cat the complications persisted beyond 14 days.

Regarding general health assessment, four owners rated their cats' health as excellent, one as good, two as poor, and three were unable to answer. Improvement in quality of life after surgery was reported in five of the cases, while two owners disagreed with any improvement, and three could not assess it. When asked to evaluate post-surgical quality of life specifically, four owners rated it as excellent, one as good, two as poor, and three were unable to respond.

Concerning recurrence of urinary problems, five owners reported no recurrence, two reported recurrence, and three could not assess the situation. In six of the cases, no change in activity levels was observed; one showed some change, and three owners were unable to

answer. Chronic lower urinary tract issues after the last hospital visit were not reported in six of the cats; one reported negative outcomes, and three did not respond.

Seven owners reported that they did not feel their cat experienced any pain, while three owners were unable to assess this issue. Hematuria was not observed in six cats; it was reported in one, and three were unable to answer. Dribbling urination was absent in six cases, present in one, and unknown in three. Polyuria was reported in one of the cats; no polyuria was noted in six, and three responses were not available. Urethral stricture was not reported in seven of the cats, with three responses unavailable.

Postoperative skin inflammation at the surgical site was absent in seven of the cats, with three owners not providing any answer. Urinary tract infection was not reported in six cases; one provided negative responses, and three could not answer.

Survey results

All owners considered the surgery necessary. Additionally, all of the respondents stated that they would recommend the surgery for other cats if indicated. Regarding satisfaction with the procedure, eight of the owners reported being very satisfied, one satisfied, and one dissatisfied. In terms of satisfaction with the cat's quality of life before and after surgery, six of the owners rated it as excellent, one as very good, and three as poor. When asked to choose between surgery and euthanasia, all respondents chose surgery.

In the present study, we evaluated the quality of life of cats before and after perineal urethrostomy surgery. Quality of life was assessed both pre- and post-operatively in cats with FLUTD (feline lower urinary tract disease).

All cats experienced issues such as urethral inflammation and obstruction (20%), difficulty or inability to urinate, dribbling urination (20%), painful urination (10%) and urethral trauma (20%). These findings were consistent with Seneviratne *et al.* (2021) study, where the main causes leading to urethrostomy surgery in 56 cats were recurrent urethral obstruction due to FIC (Feline Idiopathic Cystitis) (46.4%), urolithiasis (26.8%), severe trauma (23.2%), inflammatory mass in the penis (1.8%), and penile adenocarcinoma (1.8%).

Perineal urethrostomy remains a challenging surgery for both the surgeon and the patient. This type of surgery can affect the structure and function of the lower urinary tract. Postoperative complications and their effects on quality of life are part of these challenges. Our study revealed owners evaluate their cat's quality of life as excellent in five cases, good in two cases, and poor in three cases in the short term. In the long term, this improved over time after surgery, with six rated excellent, one rated very well, and three still rated poor. These findings are consistent with those of another study (Seneviratne *et al.*, 2021). Given the promising results after perineal urethrostomy, this surgery is recommended for owners with cats suffering lower urinary tract problems.

In the present study, all referrals and PU surgeries were performed in the autumn and winter, when the weather is colder in Tehran, with the largest number of procedures being done in January. This factor is not investigated in many other studies (Smith and Schiller, 1978; Ruda and Heiene, 2012; Slater *et al.*, 2020; Seneviratne *et al.*, 2021). However, other studies have reported a seasonal risk factor for FIC. While the exact reasons are not fully understood, several environmental stressors have been proposed based on researches and observations: indoor confinement during colder months (He *et al.*, 2022), reduced environmental enrichment and increased routine disruptions in winter (Ellis *et al.*, 2013), and lower water intake in cold weather (Taylor *et al.*, 2025).

Regarding short-term postoperative complications among all of the cats, 6 showed no complications within one month after surgery, while four experienced complications such as altered urination habits, increased frequency and urinary incontinence. Only one cat had urinary incontinence due to unrelated urinary tract problems, i.e. spinal injury due to trauma after some months. These results are in agreement with Seneviratne *et al.* (2021) study; however, their study included a larger number of cases and a broader time span of 10 years. Among 37 cats undergoing perineal urethrostomy in that study, short-term complications included sterile cystitis (nine cases), ascending lower urinary tract infection (seven cases), urinary incontinence (two cases), recurrent lower urinary tract obstruction (two cases), preputial stenosis (one case), and urine leakage into the peritoneal cavity (one case) (Seneviratne *et al.*, 2021). Slater *et al.* (2020) did not report short-term complications.

In the long-term assessment five cats were alive and healthy with no long-term complications. Three cats were euthanized upon veterinary recommendation; two cases of which were due to causes unrelated to surgery. One of these two cats had complications including hematuria, dribbling urination, urinary incontinence, and urinary tract infection caused by a spinal injury and was euthanized due to poor prognosis of this injury. The other was euthanized due to gastrointestinal issues. These findings differ from those reported by Seneviratne *et al.* (2021), possibly due to differences in reporting methods. Among 37 cats undergoing perineal urethrostomy in that study, 14 were assessed for long-term complications, with only one case of sterile cystitis and two cases of ascending lower urinary tract infection (Seneviratne *et al.*, 2021). Slater evaluated quality of life improvements between five and 29 months post-surgery, but did not provide detailed information on long-term complications (Slater *et al.*, 2020). In the study by Ruda and Heiene (2012), long-term outcomes were followed for one to 10 years. The median survival time for all cats was 3.5 years post-surgery. Forty-seven cats were alive at the time of the study. Five cats (5.8%) died within 14 days post-perineal urethrostomy, and six (7.0%) died within the first six months. Seventy-five cats (87%) survived beyond six months; of these, 45 (60%) were asymptomatic post-surgery, while 8 (10.7%) experienced

severe lower urinary tract symptoms. Data beyond six years were available for 19 cats, 13 of which were alive during the study. Six deceased cats had been euthanized due to urinary-related diseases. Eighty-eight percent of owners rated their cats' long-term quality of life as good (Ruda and Heiene, 2012).

The inability to urinate normally severely reduces the animal's quality of life and, consequently, causes multiple health problems for the patient. Therefore, surgery quickly improves the patient's condition and provides satisfaction to the animal owner. In our study, owners were mostly satisfied (90%) with the surgical outcomes. In Slater *et al.* (2020) study, 105 eligible cat owners were surveyed, and 74 responded. All respondents reported post-surgical quality of life for their cats at least equal to pre-urinary problem status, with 48% noting improvement. Quality of life scores ranged from one to 10, with 100% reporting at least a score of seven and 75% reporting a score of 10. Similarly, Ruda and Heiene (2012) reported that 88% of owners rated their cats' long-term quality of life as good (Slater *et al.*, 2020). The results of our study are consistent with previous studies, although the animal owner's expectations of the course of events after surgery and the way in which explanations are given about possible problems before surgery will affect the animal's satisfaction in the long term.

Reported short and long-term outcomes support the efficacy of perineal urethrostomy; however, caution should be exercised in generalizing results due to the short follow-up period and small sample size. Nonetheless, findings from this study can provide a foundation for future research and evidence to guide surgical interventions in cats with FLUTD. Overall, it appears that perineal urethrostomy surgery is generally successful and results in minimal long-term complications. The majority of pet owners expressed satisfaction with the surgical outcomes, and the quality of life of the patients showed significant improvement compared with the preoperative period.

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Conflict of interest

The authors have no conflict of interest to declare.

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Use of generative AI and AI-assisted technologies statement

No generative AI or AI assistant technologies were used in the design, execution, analysis, or writing of the study.

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