



Welfare of cats 5–29 months after perineal urethrostomy: 74 cases (2015–2017)

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Abstract

Objectives The objective of this study was to evaluate the long-term quality of life in cats following perineal urethrostomy.

Methods This study comprised a retrospective case series of 74 cats with urinary obstructions that received perineal urethrostomies at the American Society for the Prevention of Cruelty to Animals (ASPCA) Animal Hospital between September 2015 and July 2017. Medical records were reviewed for information on the number of obstructions prior to surgery, urinary tract problems at the time of surgery and other potential factors influencing long-term welfare. Owners were surveyed by telephone and text 5–29 months after their cat's surgery. Responses were compiled and analyzed to determine owner perception of welfare postsurgery, and to identify patterns in medical history and welfare outcomes.

Results In total, 105 cat owners were eligible for the survey; 74 responded. Altogether, 100% of responding individuals reported at least the same quality of life postsurgery compared with the cat's quality of life before demonstrating urinary problems (48% reported better). On a quality-of-life scale of 1–10 (10 = excellent), 100% of responding cat owners reported at least 7; 75% reported 10.

Conclusions and relevance Quality-of-life outcomes for cats 5–29 months after receiving perineal urethrostomy surgery were reported to be very good. Given this finding, and that perineal urethrostomy surgery should mitigate future blockages, we suggest considering perineal urethrostomy surgery as a standard tool to manage urinary obstructions in cats. The needs of the specific client and patient, including risks, costs and welfare of the cats, should drive the options for management of urinary obstructions in male cats.

Keywords: Urethral obstruction; perineal urethrostomy; welfare; quality of life

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Introduction

Urethral obstruction (UO) is a relatively common and life-threatening problem in male cats.¹ Medical management, including unblocking the cat and supportive therapies, are the customary treatment for UO.² The use of surgical management in the form of perineal urethrostomy (PU) surgery has been controversial, and data on longer term welfare outcomes are limited.^{3,4} Surgical intervention is generally considered only when the cat cannot be unblocked or when the cat has obstructed repeatedly, despite medical management.^{2,4–6}

Studies have shown that diet, weight and environmental factors contribute to UO, but the magnitude and significance of these effects are inconsistent and often idiopathic.^{6–9} One recent review identified indoor status,

low water intake and high body weight as common predisposing conditions for UO.¹⁰ Among cats that have

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previously obstructed, re-obstruction rates are as high as 36%.⁸ Factors affecting recurrence rates of UO are also unclear, and at times contradictory.¹¹ Because the underlying causes of UO are poorly understood, and recurrence rates high, management decisions are particularly complex.

PU surgery corrects obstructions, but is expensive and does not address the underlying causes of UO, thus clinical signs often persist.^{3,11,12} In addition, PU surgery can potentially lead to postoperative complications, including strictures, stenosis, dehiscence, urine scalding and incontinence; however, these can generally be minimized with appropriate surgical techniques, as well as careful tissue handling.^{6,13–15} The most commonly reported long-term complication is urinary tract infection (UTI).¹¹ Some prior research indicates that PU may cause bacterial infections. For instance, Osborne et al⁵ found no incidence of bacterial infections in a group of cats that was medically managed for UO, while nearly half of surgically treated cats experienced bacterial infections within a year.⁵ However, other work suggests the incidence of infections could be due to underlying uropathy rather than the surgery itself. Griffin and Gregory¹⁶ performed PU surgeries on 12 obstructed cats and 10 healthy cats with no prior urinary issues.¹⁶ None of the healthy cats had UTIs following surgery, while 22% of obstructing cats did.¹⁶

There are many factors that influence a cat's candidacy for PU surgery, including the underlying cause and prior occurrences of UO, the likelihood of recurrence and the risk of death owing to UO. Factors considering cat and owner lifestyle are equally important, but less often discussed. How the cat is doing in the home, its quality of life (QoL), challenges of managing urinary diseases medically, costs of repeated episodes, the cost of the surgery and owner's time constraints, all affect a cat's wellbeing, and are crucial considerations when making the decision to use PU to manage UOs. The veterinarian–client relationship is another factor to consider when a client is deciding if PU surgery is right for their cat; the veterinarian–client relationship influences the perceived quality of care, client satisfaction and treatment compliance.^{17,18}

Two studies have documented the wellbeing outcomes of cats undergoing PU surgery. Ruda and Heiene¹² reported that 88% of cat owners responding to a 6-month PU follow-up survey categorized their cats' overall long-term QoL after PU as good. Most of these owners (89%) also reported that they were satisfied with the decision to have the PU surgery performed and would recommend it to others. However, two owners did not recommend the surgery owing to the cost. Bass et al¹¹ reported that of 35 cat owners, 94% were satisfied with the outcome of surgery, and 89% reported their cats had a very good QoL after surgery.

PU surgery is generally considered only after other approaches have failed and the cat repeatedly re-blocks (typically after the third blockage).⁴ Performing PU surgery earlier, such as at the second occurrence rather than the third, could potentially decrease suffering and the risk to obstructed cats. To support this potential approach, this project conducted surveys with cat owners 5–29 months after PU surgery at the American Society for the Prevention of Cruelty to Animals (ASPCA) Animal Hospital. This research project was designed to: (1) determine the impact of PU surgery on retention in the home (vs surrender to a shelter or euthanasia owing to the disease); (2) describe owner-reported cat health and welfare; and (3) document owner perception of the cat's QoL. These results help inform the field and provide evidence to expand surgical treatment options for UO in cats.

Materials and methods

Case selection

The ASPCA Animal Hospital (AAH) accepts urgent or emergency patients belonging to economically disadvantaged New York City metropolitan residents. At the time of these surgeries, owners could walk in with their pets for veterinary care or be referred by private veterinarians in the area or other ASPCA programs in New York City.

Cases included cats of any age that had PU surgery at the AAH from September 2015 to July 2017. There were 122 cats with PU surgeries during this period. Nine were excluded from follow-up: five owing to no contact information on record, three as a result of the cat being euthanized owing to poor prognosis (two owing to severe urethral damage that was indicated at the time of surgery leading to postoperative urine leakage, one owing to severe cardiac disease and anemia) and one reported in the medical record as having died at home without additional information 1–20 days post-PU surgery. Therefore, 113 cats were eligible for follow-up.

All PU surgeries were performed according to Wilson and Harrison.¹⁹ Nylon or polydioxanone suture materials were used. All owners were given verbal recommendations for prescription diets or canned food only at discharge and could obtain a sample of a prescription diet. Written instructions were sometimes provided. Antibiotics and pain medication at a minimum were prescribed. An Elizabethan collar was sent home on all cats. The owners were requested to return their cats 2–3 weeks postoperatively for suture removal.

Medical records review

Data from the medical records database of the AAH identified which cats had received PU surgery from September 2015 to July 2017, as well as client contact

information. For each cat for which there was a completed telephone survey, the following preoperative data were extracted from the medical record, if available: sex, age, weight, presence of UTI as documented by either bacteria in the urine sediment and/or positive urine culture, presence of crystals, number of obstructions prior to surgery, and notes on whether the surgery was performed because of financial concerns and a preference for PU to minimize re-blocking, or because the veterinarian felt that the patient had failed previous medical management to prevent UO.

Data on findings at surgery included date of initial visit and discharge, name of the vet performing the surgery, reobstruction and prescribed medication postsurgery. The presence of urethral trauma or stricture at the time of surgery was also documented. Urethral integrity was subjectively described based on visual appearance of the urethral mucosa. A urethra was considered strictured if there was obvious focal narrowing of the lumen when transected longitudinally; these cases generally also had subjective dilation of the pelvic urethra. Tearing of the mucosa was identified visually by a discrete loss of mucosa and was often seen in conjunction with periurethral edema and extravasation of urine within the surrounding tissues. Additional data on postsurgical visits were extracted when available.

Client survey

A telephone survey was conducted from July 2017 to January 2018 (see the supplementary material). The survey consisted of questions pertaining to whether the cat was alive and still in the home, litter box and urination issues, food and water, veterinary history pre- and postsurgery, and overall QoL. Two questions about QoL were included. The first question had three parts: part 1 asked 'Please think back to the time before surgery when your cat was NOT having this particular problem. How would you describe how he was doing then?' (open-ended); part 2 asked 'Now, compared to that time before surgery when he wasn't having this problem, would you say his life is better today than it was then, is the same today as it was then, or is worse today than it was then?'; and part 3 asked 'Can you explain how so?' (open-ended). The second question asked, 'Also, we're interested in what you think your cat's overall quality of life is since he had surgery – meaning his overall health, comfort, and happiness. How would you rate his quality of life on a scale from 1 to 10, with 1 being very poor and 10 being excellent?... and why did you choose that particular rating?' (open-ended).

Interviewers were trained and monitored intermittently to administer the standard survey per protocol. Spanish translations were provided and two of the three interviewers were bilingual. Therefore, surveys could be conducted in English or Spanish. Clients received a letter

1–2 weeks in advance of their first telephone call informing them about the study. When email addresses were available, emails were also sent with this information. Of the 113 owners eligible for the study, nine had wrong or disconnected numbers and no email available in the records, so 104 owners were contacted and asked to participate in this study.

Each client received six call attempts, two during weekday hours (11am–5pm EST), two during weeknight hours (5pm–8pm EST) and two during weekend hours (11am–5pm EST). In addition, when all phone attempts were unsuccessful, an abbreviated version of the survey was texted to the client. In total, there were 74 surveys completed, 64 by telephone and 10 by text, out of 104 owners that we attempted to contact.

This study was deemed exempt from Institutional Review Board (IRB) oversight by Chesapeake IRB (14 June 2017, Pro00021954).

Statistical analysis

Owner-reported history of UO was documented in the medical records and converted to one of three categories: one or two obstructions (one obstruction, 1–2 obstructions or two obstructions), two or three obstructions (2–3, and three obstructions) or more than three obstructions (3–4 obstructions or more).

Associations between owner-reported QoL and pre-surgery characteristics, such as age, weight, urethral trauma, strictures and UO, were analyzed using Fisher's exact test, as were postsurgical outcomes, such as UTIs, retention in the home, compliance with special diets and persistent litter box issues. Currently being on special diet/canned food and the association with ongoing signs of feline lower urinary tract disease (FLUTD) was also compared. All Fisher's exact tests used $P < 0.05$ as the cut-off for statistical significance. All statistical analyses were performed in Stata version 15 (StataCorp).

Results

Medical record findings

Presurgery The 74 cats in this study were all male. The median age was 4 years (minimum 3 months; maximum 16 years); 65/74 cats were neutered. The mean weight at surgery was 5.3 kg (11.7 lb) ranging from 1.6 kg (3.6 lb) to 9 kg (20 lb) at the time of surgery. The number of UOs prior to surgery ranged from 1 to 7. The median was 2–3 UOs as reported by the owners.

Sixteen cats had a urinalysis with culture performed (22%); three cats had bacteriuria (two with rods and one with enterococcus). Medical records indicated that 19 cats had stones, grit or sand in their bladders at the time of PU; cats with stones at the time of PU surgery also received cystotomies.

There were 64 cats (86% of total cats) where the medical record provided information allowing for

classification of the reason for PU surgery as medical, financial (too expensive to continue to unblock the cat) or both. Forty-seven cats (73%) failed medical management, 10 (16%) underwent surgery due to financial considerations and seven (11%) indicated both reasons.

Of the 54 cats where the record indicated failed medical management as a reason for to the decision for PU surgery (with or without financial concerns), 50 owners provided data on diet. Forty owners (80%) reported that the cats had been on a special diet or canned food prior to surgery. Four owners reported they could not afford the special diet, three reported the cat would not eat it, one indicated they used the diet only short term and one was not sure what to buy (one did not respond). Of the 10 owners where financial reasons were reported as a primary factor in deciding upon PU surgery, all were feeding their cat the special diet/canned food.

Postsurgery The length of hospitalization ranged from a minimum of 2 days to a maximum of 29 days (median 6 days). Seventy-three cats (99%) had PU surgeries performed by boarded surgeons and one (1%) by a highly experienced surgeon.

Three cats with large quantities of grit reported at surgery reobstructed during hospitalization immediately after PU surgery and were briefly catheterized. Urinary strictures were noted in 16 cats at the time of surgery. The records of an additional 34 cats indicated urethral thickening or tearing at the time of surgery.

All but three cats were prescribed amoxicillin/clavulanic acid (13.75 mg/kg PO q12h for 7–10 days) upon discharge; those three cats received amoxicillin (20 mg/kg PO q12h for 7–10 days) or enrofloxacin (5 mg/kg PO q12h for 7–10 days). All cats received buprenorphine (0.015 mg/kg PO q8–12h for 3–5 days) and an Elizabethan collar; 14 also received robenacoxib (2 mg/kg PO q24h for 3 days). Twenty-eight cats (34%) were sent home on prazosin (1 mg PO q8–12h for 5–7 days).

Fifty-six cats (76%) attended a routine follow-up visit, including a physical examination, and an additional five owners (8%) were contacted by telephone to determine how the cat was doing. Urine culture (nine cats) or urinalysis (one cat) was performed at follow-up only for cats with abnormal recent history or clinical signs (lethargy, poor appetite, vomiting, pollakiuria, fever, painful abdomen, etc). All 10 cats (19%) had bacteria present at follow-up examination within 3 months postsurgery (median of 16 days), four that had bacteria detected previously, five that previously had a preoperative negative culture and one with no previous culture.

Survey results

Of 104 clients where contact was attempted, 74 completed surveys about their cat (71% response rate). Follow-up calls with the owners ranged from 5 to 29

months postsurgery (median 13 months; mean 15 months, interquartile range 7–23 months).

Outcomes were determined for 78 cats: 74 (95%) whose owners responded to the survey and four (5%) that were euthanized immediately after PU surgery. Of the 74 cats with follow-up, 90% (n = 67) were in their original home, 7% (n = 5) had been rehomed to family or acquaintances for reasons unrelated to the PU, 1% (n = 1) was killed by a car 11 months after surgery and 1% (n = 1) was surrendered to animal control 1.5 months post-PU for reasons unrelated to the surgery.

Of the 74 survey respondents, 27% (20 cats) reported some litter box issues postoperatively. Four cats (5%) showed only short-term problems that resolved within 2 weeks. Eight cats (11%) were reported to have intermittent issues, such as bloody urine, straining or urinating outside the litter box. The remaining eight cats (11%) were reported to have ongoing issues, including crouching/straining, bloody urine or urinating outside the litter box.

Eighty-eight percent (n = 65) of survey respondents reported that a special diet or canned food only was recommended. Of those owners, 55 (83%) had their cats on a special diet (n = 43/55) or canned food only (n = 12/55) at the time of the interview. Of the 11 owners whose cats were not on a special diet or canned food only, three could not afford the diet, three had cats that would not eat the food, one reported they were told only to stay on the diet for a finite period and two were not sure what to buy (two owners did not answer this question). Five owners reported feeding their cat canned food instead of a special diet because it was too expensive. Of the nine owners who reported what the cat was eating instead of the special food, five reported a mix of canned and dry food, two dry food only (one with water added) and another urinary diet of canned and dry food. There was no association between feeding special diets or canned-food-only and ongoing FLUTD clinical signs ($P = 0.5$).

Of the 56 owners who reported whether their cat had been to a veterinarian prior to the visit where PU surgery was performed, 44 (79%) said yes; 35/44 cats (80%) that had been to a veterinarian did so to address urinary tract problems or previous obstructions. Only nine (16%) owners responding to this question reported taking their cats to a veterinarian for reasons unrelated to FLUTD: six for routine preventive care and three for other health issues.

QoL All owners who reported a QoL score (n = 69/74) gave the cat a 7/10 or higher; 75% reported a 10/10. Fifty-six owners reported whether their cats' lives were better, the same or worse at the time of interview vs the time before surgery when their cat was not having this problem; 10 were not asked in the text survey, three were

not sure and five did not respond to this question. Of the 56 owners who responded, 48% said their cats' lives were better and 52% said the same vs before surgery when their cat was not having this problem. Several owners further explained that their cat was better than before because the cat was no longer blocking, was no longer demonstrating signs of pain, and was more engaging and attentive.

There was no association between owner-reported QoL scores when compared with retention in the home ($P = 0.28$), feeding special diets ($P = 0.74$) or having litter box issues ($P = 0.06$). There was no significant association between reported post-PU QoL scores and the number of prior UOs ($P = 0.32$). There was no significant association between the presence of a stricture ($P = 30$) or visible urethral trauma at the time of surgery ($P = 0.41$) or the presence of a UTI ($P = 0.65$) and post-PU QoL scores.

Discussion

PU is typically considered a stop-gap measure for managing repeated obstructions, considering surgical intervention only in cases where medical management has failed to prevent further blockages.^{1,4,6} There is little guidance in the literature regarding when to proceed with PU, yet performing PU after the third blockage appears to be standard practice.⁴ This study did not seek to identify clear guidelines for veterinarians regarding when to perform PU surgery. However, the results show that cats have at least the same QoL post-PU surgery compared with their QoL prior to surgery, suggesting that it may not be necessary to wait until after the third obstruction to consider PU surgery.

This work reinforces findings from similar research demonstrating positive long-term effects of PU on cats with UO.¹² Like Ruda and Heiene,¹² we found there were few recurrent blockages after PU surgery, and those cats that did re-block did so immediately after surgery; none of the cats re-blocked after discharge during the study period. There was also a reduced incidence of FLUTD signs: <20% of cats attending a postsurgical check-up demonstrated continued signs of FLUTD, and 73% of cat owners reported no continued problems associated with FLUTD.

To conservatively manage UO, veterinarians typically resort to medical management. Some research reports few complications associated with properly implemented medical management of UO. For instance, Hall et al²⁰ found that decompressive cystocentesis and catheterization did not cause bladder rupture. However, other research demonstrates that medical management can lead to many of the same complications as PU surgery, such as bacterial infections and damaged urinary tract tissue.^{4,21,22} For instance, Corgozinho et al²² found that of 15 obstructed cats requiring PU surgery, 10 had developed strictures and five had ruptured urethras

owing to catheterization to remove prior blockages. Our results showed that 16 cats (22%) had strictures, and an additional 34 (44%) had urethral thickening or tearing prior to PU surgery, suggesting that urethral tissue was damaged during prior treatment.

Medical management can help to diminish the recurrence of UO, but it is not always successful.²³ Even when medical management effectively reduces UO recurrence, cats are still vulnerable to re-blocking; 22–35% re-block within 6 months.⁸ Only 3/74 (4%) cats re-blocked during the study period, all immediately after surgery; none re-blocked after discharge. Blocked cats typically receive surgery after their third blockage.⁴ If PU surgery is completed during the second blockage, the risk of re-blocking a third time is greatly reduced, potentially preventing illness and pain, and reducing the risk of death due to UO.

The costs of treatment are also an important consideration when discussing options for UO management with pet owners. If the typical cost of UO treatment and that of PU surgery are relatively similar at a veterinary clinic, this may influence which treatment option is best for a given cat and its owner, particularly for cats that have blocked more than once. Given that cats which undergo medical management of UO may potentially block again, the additional cost of unblocking repeatedly could potentially be avoided by PU surgery.

The sample of cats included in this study present a similar signalment as cats reported in the literature with UO.⁶ The sample of owners, however, may differ from other studies. The AAH specifically targets the underserved population of New York City, providing care to pets of individuals with limited resources. This aspect of our sample, and of similar clients with limited resources in other veterinary clinics, may strengthen the argument to consider PU surgery as a mode of UO treatment earlier than the third blockage.

AAH clients tend to have limited access to veterinary care, owing to transportation, proximity or financial reasons, and may not be able to respond rapidly to a UO recurrence, potentially increasing the cat's suffering and likelihood of death. In addition, routine FLUTD management, such as special diets, may be prohibitively expensive or inaccessible to cat owners with limited finances. Among our survey respondents who did not feed their cat the recommended special diet, the most frequently cited reason was that they could not afford it. In cases where veterinary cost or accessibility are issues for cat owners, PU may be a more attractive option because it reduces the risk and cost of recurrent obstructions.

All of the surgeons performing PU surgery at the AAH were very experienced so it is possible that more complications could occur with less experienced surgeons, which could influence QoL following PU.⁶ Our results are thus most generalizable where PU is

performed by skilled surgeons with good tissue handling technique.

Our high response rate decreases the likelihood of substantial non-response bias. While our QoL questions have not been validated, the results of the two questions were similar and consistent with other comments made by the owners during the interview. In addition, our findings are similar to other work that demonstrates positive QoL outcomes in cats following PU surgery.^{6,11,12}

While no responding cat owners reported surrendering their animal due to ongoing issues related to PU surgery, 22% reported litter box issues that persisted >2 weeks after the surgery. As the median time span between surgery and the follow-up survey was 7 months, it is possible that some cat owners could have surrendered their cat for complications related to PU surgery following the survey. Had our median follow-up time been longer, we would have likely found that more cats had died. A longer-term PU follow-up conducted by Ruda and Heine found the majority of causes of death were unrelated to UO.¹²

The primary focus of this paper was to identify the welfare and QoL outcomes of cats that underwent PU surgery and how this influenced retention of the cat in the home. We found that all responding cat owners reported at least the same, if not improved, QoL for their cats following PU surgery vs their cats' QoL prior to UO. This result suggests that PU surgery need not be considered only in the most severe cases. Because there is little guidance in the literature regarding when to proceed with PU, future research that identifies clear guidelines for veterinarians regarding when to perform PU surgery would be valuable. These guidelines should include the client decision-making process so they can be tailored to the needs and desires of the individual client and cat.

Conclusions

Our results demonstrate that cats which undergo PU surgery have the same, or better, QoL as they did prior to urinary obstruction. These results suggest veterinarians could potentially consider the use of PU surgery after fewer UOs, in conjunction with owner discussions to determine the best option for a given owner and their cat.

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Supplementary material The following file is available online:
PU client follow-up survey – first and second interviews.

Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval This study involved the use of client-owned animals only, and followed internationally recognized high standards ('best practice') of individual veterinary clinical patient care. Ethical approval from a committee was not therefore needed.

Informed consent Informed consent (either verbal or written) was obtained from the owner or legal guardian of all animal(s) described in this study for the procedure(s) undertaken.

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