

Percutaneous Drainage in the Management of Urethral Blockages in Cats

A Knowledge Summary by

David L Haine MA, VetMB, MRCVS^{1*}

Emma Place MA, BSc¹

¹ University of Bristol, Senate House, Tyndall Avenue, Bristol, BS8 1TH, UK

* Corresponding Author (davidhaine@gmail.com)

ISSN: 2396-9776

Published: 20 Nov 2018

in: Vol 3, Issue 4

DOI: <http://dx.doi.org/10.18849/ve.v3i4.171>

Reviewed by: Wanda Gordon-Evans (DVM, PhD, DACVS, DACVSMR) and Jacqueline Cole (BSc, BVetMed, MRCVS)

Next Review Date: 20 Nov 2020



PICO question

In adult male cats with a urethra blockage, is indwelling catheterisation more effective than percutaneous drainage in reducing the incidence of recurrence?

Clinical bottom line

Based on the available literature, it would appear that recurrence rates following percutaneous drainage are broadly similar to those managed with indwelling catheterisation. However, the level of evidence supporting the use of percutaneous drainage is very low and there are significant uncontrolled variables between all available studies, with the consequences that meaningful comparisons between recurrence rates are not possible. More studies are needed before routine use of percutaneous drainage as an alternative to indwelling catheterisation can be advocated.

Clinical Scenario

A 7y MN DSH cat presents to your clinic with a 24-hour history of pollakiuria and haematuria, and a 4-hour history of non-productive stranguria. Abdominal palpation reveals a firm distended bladder which cannot be manually expressed, biochemistry reveals a moderate azotaemia, lateral abdominal radiographs do not suggest the present of any calculi. The owner has significant financial restrictions and would like to know if any other options for management other than indwelling catheterisation are available and how likely the problem would be to recur.

Summary of the evidence

Gerber, B. et al. (2008)	
Population:	Male cats diagnosed with urethral obstruction admitted to the Clinic for Small Animal Internal Medicine, University of Zurich, between December 2000 and November 2002.
Sample size:	Forty-five male cats with urethral obstruction.
Study design:	Retrospective single centre case series.
Outcome studied:	Time to recurrence of signs, if deceased, whether death was related to lower urinary tract disease. Assessed through reviewing clinical records and telephone interview with owner.
Main findings: (relevant to PICO question):	<ul style="list-style-type: none"> Cats in the study had an age range of 1-15 years, with a mean of 5 years. 24/45 were diagnosed with idiopathic urethral obstruction, 13/45 had urolithiasis, and 8/45 had urethral plugs. 32/45 cats were managed non-surgically, with a median hospitalisation period of 4.5 days and a range of 1-12 days. 29/32 non-surgical cats were managed with indwelling urethral catheterisation. A variety of different medication regimens were used for

	<p>different cats including: diazepam, flvoxat, phenoxybenzamine, non-steroidal anti-inflammatories, heparin, amitriptyline, N-acetyl-glucosamine, and a variety of antibiotic therapies.</p> <ul style="list-style-type: none"> • Follow up was available for 39 cases (8 managed surgically, 31 managed non-surgically), for a range of 5-868 days and a median of 432 days. • 15/31 cats with follow up managed non-surgically developed recurrent signs of FLUTD and 11/31 (35%) re-obstructed, with a range of 3-728 days to obstruction and a mean of 18 days. • Frequency of re-obstruction was not significantly correlated with the primary cause of the obstruction ($P > 0.05$).
Limitations:	<ul style="list-style-type: none"> • Retrospective case series, low on evidence hierarchy. • There was a significant variability in medical management between cases. • Follow up was for a wide range between cases, meaning re-obstruction may have occurred without being reported. • The series describes a single centre referral population, which may not be directly comparable with other populations. • No control group.

Cooper, E.S. et al (2010)	
Population:	Male cats brought to The Ohio State University Veterinary Teaching Hospital for treatment of naturally occurring urethral obstruction between June 2007 and June 2008, and in which the owners had declined conventional treatment (catheterisation and intensive care). Cases were excluded if severe metabolic derangements or radiographically visible uroliths were present.
Sample size:	Fifteen male cats.
Intervention details:	<ul style="list-style-type: none"> • Cats were sedated with a combination of acepromazine, buprenorphine and medetomidine and placed in a dark environment. • Decompressive cystocentesis and subcutaneous fluid administration was performed as necessary. • Intervention was charged at a fixed price significantly lower than the clinics normal protocol of hospitalisation in an intensive care unit with an indwelling urinary catheter. • Treatment success was defined as spontaneous urination within 72 hours of starting therapy.
Study design:	Prospective case series.
Outcome studied:	Time to spontaneous urination, incidence of recurrence.
Main findings: (relevant to PICO question):	<ul style="list-style-type: none"> • Intermittent percutaneous drainage was successful in treating 11/15 cats (73%). • Mean time to spontaneous urination was 34.6 hours.

	<ul style="list-style-type: none"> • Of those successfully treated, recurrence rate at three days was 0/11 cats (0%) and 2/11 (18%) cats at three weeks. • 4/15 (27%) cats were euthanised due to treatment failure (failure to spontaneously urinate).
Limitations:	<ul style="list-style-type: none"> • Single centre case series, low on evidence hierarchy. • The study described a small sample size, meaning that conclusions are less statistically robust and the extent to which they can be extrapolated to other populations is limited. • The series describes a single centre referral population, which may not be directly comparable with other populations. • No control group.

Eisenberg, B.W. (2013)	
Population:	Male cats presented to the emergency departments of three referral hospitals due to acute urethral obstruction between April 1, 2010, and April 30, 2011. Cases were excluded if an indwelling urinary catheter had been placed prior to arrival at the participating hospital. Further exclusion criteria included catheterisation for < 1 hour, death or euthanasia prior to urethral catheter placement, and incomplete medical records. All cats treated surgically during the initial hospitalisation period were excluded from the study population.
Sample size:	83 male cats.
Intervention details:	<ul style="list-style-type: none"> • Cats were sedated and an indwelling urinary catheter was placed. • The urinary catheter was removed after stabilisation of azotaemia, resolution of haematuria, or after 24 hours had passed. • Follow up information was surveyed from telephone or email conversations 30 days post discharge.
Study design:	Prospective multi-centre (three) case series.
Outcome studied:	Incidence of, and time to, re-obstruction. Duration of catheterisation.
Main findings: (relevant to PICO question):	<ul style="list-style-type: none"> • 68 cases had follow up, of these 10/68 (15%) had a repeat episode of obstruction during the follow up period (median follow up period 41 days, range 25-110 days). • Shorter duration of catheterisation was significantly associated with a higher probability of recurrent obstruction in the follow-up period ($P = 0.03$) (median 24.5 hours [range, 1 to 54 hours] vs median, 26.5 hours). • Catheterisation with a smaller catheter (3.5Fr vs 5Fr) was not significantly ($P = 0.99$) associated with the risk of recurrent urethral obstruction.
Limitations:	<ul style="list-style-type: none"> • Case series, low on hierarchy of evidence. • The study described a relatively small sample size (83 cats),

	<p>meaning that conclusions are less statistically robust and the extent to which they can be extrapolated to other populations is limited.</p> <ul style="list-style-type: none"> • The study describes a referral population, which may not be directly comparable with other populations. • 15/83 cases were lost to follow up, which may affect reliability of results. • Treatment interventions were not standardised, with interventions (for example medical therapy protocol) varying at the discretion of the attending veterinarian. • No control group.
--	---

Hetrick, P.F. and Davidow, E.B. (2013)	
Population:	Male cats with urethral obstruction (excluding urolithiasis, neoplasia, or toxicosis) that were treated at an emergency and specialty centre from January 2004 through December 2010 with an indwelling urinary catheter.
Sample size:	192 male cats with follow up data for the 24-hour period after removal of a urinary catheter, of which 157 had follow up for 30 days.
Intervention details:	<ul style="list-style-type: none"> • All cats were managed with an indwelling polyvinyl chloride urinary catheter, size chosen at clinicians' discretion. • Cats were prescribed either prazosin or phenoxybenzamine following removal of the indwelling urinary catheter.
Study design:	Retrospective single centre case series.
Outcome studied:	Rate of recurrent urethral obstruction (rUO).
Main findings: (relevant to PICO question):	<ul style="list-style-type: none"> • Mean duration of urinary catheterisation was 36 hours. • There was a lower rate of rUO in cats that had a 3.5Fr urinary catheter as compared to cats with a 5Fr catheter. • Overall rUO rates were 11% (21/192 cats) at 24 hours and 24% (37/157 cats) at 30 days after IUC, with 86% of rUO (32/37 recurrences) occurring within 4 days of indwelling catheter removal. • Administration of analgesia (meloxicam/opioids) did not make a significant difference to rates of rUO ($P > 0.05$).
Limitations:	<ul style="list-style-type: none"> • Significant variation between treatment protocols and follow up, including a hospital protocol shift halfway through the series, also a potential source of bias. • Retrospective single centre case series, low down the hierarchy of evidence. • Some cases (35/192 cats) were lost to follow up, which may affect the reliability of results. • Cases are from 2004-2010, so medications, equipment and management techniques may have changed since the study period. • Population data including weight and breed were not described, making it difficult to compare to other

	<p>populations.</p> <ul style="list-style-type: none"> • All cats in the study had polyvinyl chloride infant feeding tubes placed as urinary catheters. These may not be directly comparable to urinary catheters used in other studies or institutions. • No control group.
--	--

Appraisal, application and reflection

This search presented few studies that assessed the incidence of recurrence in cats managed with either indwelling urinary catheterisation or percutaneous drainage, of which none directly compared the two approaches, meaning that more studies are needed to draw firm conclusions as to the comparative efficacy of these techniques. All of the studies described case series in referral populations, which may not be applicable to the majority of cases managed in first opinion practice, as these are often cases deemed by a primary vet to be more challenging to manage. There is significant variation in treatment protocols between and within different centres, leading to a significant number of uncontrolled variables. All of the data used is more than 5 years old, leaving the potential for treatment protocols to have changed and evolved since publication – in one study there was a significant evolution in protocol *during* the study (Hetrick & Davidow, 2013). Several of the studies with relevant data are retrospective studies, so there is potential for significant bias in the selection and treatment of cases. There is variation in the time scale of follow up between studies, meaning that re-obstruction in one study could have occurred without being included in the results (Gerber, Eichenberger, & Reusch, 2008) and the measures for outcome are not consistent between studies, with death and recurrence of obstruction both used as endpoints for treatment failure. There is only one study evaluating the effect of percutaneous drainage on time to recurrence, which has a small sample size of just 11 cats with follow up to 30 days. Overall the quality and extent of the evidence is limited, meaning that significant conclusions are hard to draw from the data.

Considering the studies generated through this search strategy, there is no evidence to support the advantage of either percutaneous drainage or indwelling catheterisation over each other in reducing recurrence rates when managing urethral obstruction in cats. Cats managed with an indwelling urethral catheter report recurrence rates of 24% in one study evaluating 30 day follow up (Hetrick & Davidow, 2013) and 15-31% in studies with longer, variable follow up (Gerber, Eichenberger, & Reusch, 2008) (Eisenberg, et al., 2013). Cats managed with percutaneous drainage reported a recurrence rate of 18% at three weeks, although this is based on just 11 cases (Cooper, Owens, Chew, & Buffington, 2010). Based on these data, it could be suggested that recurrence rates between these two techniques are broadly similar. However, the level of evidence supporting the use of percutaneous drainage is extremely limited, meaning that further studies are necessary, ideally comparative, prospective multi-centre studies with significant sample sizes, before any significant conclusions can be made about the true incidence recurrence after use of the technique.

Methodology Section

Search Strategy	
Databases searched and dates covered:	CAB Abstracts on OVID platform 1973-2017 Medline on OVID platform 1946-2017
Search terms:	CAB Abstracts: [[cat disease/or cats] OR [(cat or cats or feline* or felis or felid*).mp.]] AND [[(obstruction or urinary tract disease or urethra* or urinary calculi or urolithiasis).sh.) OR [urinary tract/] OR [(urethra or "urinary tract").mp.]] AND [[[catheter or catheterization).sh.] OR [(catheter* or catheteri?ation).mp.]] AND [limit to english language]

	Medline: [felis/ or cats/] OR [(cat or cats or feline* or felis or felid*).mp.] AND [[urethral obstruction/ or urolithiasis/] OR [(urethra* or “urinary tract”).mp.]] AND [[catheterization/ or urinary catheterization/ or intermittent urethral catheterisation/] OR [(catheter* or catheteri?ation).mp.]] AND [limit to English language]
Dates searches performed:	18 th December 2017

Exclusion / Inclusion Criteria	
Exclusion:	Single case reports, book chapters/opinion, conference proceedings, correspondence, articles not relevant to PICO question.
Inclusion:	Articles relevant to PICO question.

Search Outcome							
Database	Number of results	Excluded – single case report	Excluded – book chapter/opinion	Excluded – conference proceedings	Excluded – correspondence	Excluded – irrelevant to PICO	Total relevant papers
CAB Abstracts	193	31 (162)	22 (140)	20 (120)	1(119)	116 (3)	3
Medline	165	16(149)	1 (148)	0 (148)	1 (147)	143 (4)	4
Total relevant papers when duplicates removed							4

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- Cooper, E. S. et al., 2010. A protocol for managing urethral obstruction in male cats without urethral catheterization. *Journal of the American Veterinary Medical Association*, 1 December, 237(11), pp. 1261-1266. <http://dx.doi.org/10.2460/javma.237.11.1261>
- Eisenberg, B. W. et al., 2013. Evaluation of risk factors associated with recurrent obstruction in cats treated medically for urethral obstruction. *Journal of the American Veterinary Medical Association*, 15 October,

243(8), pp. 1140-1146. <http://dx.doi.org/10.2460/javma.243.8.1140>

3. Gerber, B., Eichenberger, S. & Reusch, C. E., 2008. Guarded long-term prognosis in male cats with urethral obstruction. *Journal of Feline Medicine and Surgery*, 1 February, 10(1), pp. 16-23.
<https://doi.org/10.1016/j.jfms.2007.06.007>
4. Hetrick, P. F. & Davidow, E. B., 2013. Initial treatment factors associated with feline urethral obstruction recurrence rate: 192 cases (2004–2010). *Journal of the American Veterinary Medical Association*, 15 August, 243(4), pp. 512-519. <https://doi.org/10.2460/javma.243.4.512>

Intellectual Property Rights

Authors of Knowledge Summaries submitted to RCVS Knowledge for publication will retain copyright in their work, and will be required to grant RCVS Knowledge a non-exclusive license of the rights of copyright in the materials including but not limited to the right to publish, re-publish, transmit, sell, distribute and otherwise use the materials in all languages and all media throughout the world, and to license or permit others to do so.

Disclaimer

Knowledge Summaries are a peer-reviewed article type which aims to answer a clinical question based on the best available current evidence. It does not override the responsibility of the practitioner. Informed decisions should be made by considering such factors as individual clinical expertise and judgement along with patient's circumstances and owners' values. Knowledge Summaries are a resource to help inform and any opinions expressed within the Knowledge Summaries are the author's own and do not necessarily reflect the view of the RCVS Knowledge. Authors are responsible for the accuracy of the content. While the Editor and Publisher believe that all content herein are in accord with current recommendations and practice at the time of publication, they accept no legal responsibility for any errors or omissions, and make no warranty, express or implied, with respect to material contained within.

For further information please refer to our [Terms of Use](#).

RCVS Knowledge is the independent charity associated with the Royal College of Veterinary Surgeons (RCVS). Our ambition is to become a global intermediary for evidence based veterinary knowledge by providing access to information that is of immediate value to practicing veterinary professionals and directly contributes to evidence based clinical decision-making.

<https://www.veterinaryevidence.org/>

RCVS Knowledge is a registered Charity No. 230886.
Registered as a Company limited by guarantee in England and Wales No. 598443.

Registered Office: Belgravia House, 62-64 Horseferry Road, London SW1P 2AF



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).