Urethral Deobstruction in Cats

Edward Cooper, VMD, MS, DACVECC
The Ohio State University
College of Veterinary Medicine

See related articles, **Urethral Obstruction in Cats**, page 37, & **Follow the Law: Do You Know Who Can Deobstruct Cats in Your State?**, page 61

Urethral obstruction is a potentially life-threatening manifestation of feline lower urinary tract disease that requires immediate medical intervention. Following are recommendations and guidelines for urethral deobstruction in cats, with an emphasis on the importance of minimizing urethral trauma because tearing or stricture formation can increase patient morbidity and mortality and add to treatment costs.[1]

Anesthesia Protocols for Urethral Deobstruction*

PATIENTS WITH NORMAL MENTATION & PHYSICAL PARAMETERS

Premedication/sedation/analgesia

- Ketamine (5-10 mg/kg IV or IM) + diazepam or midazolam (0.25-0.5 mg/kg IV or IM)

or

- Buprenorphine (0.01-0.02 mg/kg IV or IM) + acepromazine (0.03-0.05 mg/kg IV or IM) or diazepam/midazolam (0.25-0.5 mg/kg IV or IM)

Coccygeal epidural[3]

- Lidocaine 2% (0.1-0.2 mL/kg)

Induction

- Propofol (1-4 mg/kg IV, to effect)

Maintenance

- Inhalant anesthesia (eg, isoflurane, sevoflurane)

PATIENTS WITH ELECTROLYTE ABNORMALITIES AND/OR CARDIOVASCULAR OR CARDIORESPIRATORY COMPROMISE

Sedation/analgesia only

- Buprenorphine (0.01-0.02 mg/kg IV or IM) + diazepam or midazolam (0.25-0.5 mg/kg IV or IM)

or

- Methadone (0.2-0.25 mg/kg IV or IM) + diazepam or midazolam (0.25-0.5 mg/kg IV or IM)

Coccygeal epidural[3]

- Lidocaine 2% (0.1-0.2 mL/kg) administered into the sacrococcygeal epidural space

**Protocols preferred by the author*

Anesthesia Protocol

A protocol for managing urethral obstruction without the use of a urethral catheter (as an alternative to euthanasia) has been described in the literature,[2] but management of urethral obstruction through placement of a urethral catheter is still the standard of care.

Initial stabilization includes placement of an IV catheter and initiation of fluid therapy. To optimize urethral catheter placement and minimize damage to the urethra, administer analgesia and sedation or anesthesia. For unstable patients (ie, those with electrolyte abnormalities and/or respiratory or cardiovascular compromise), administration of only light sedation should be sufficient. Patients with stable vital signs may receive higher sedative doses or be placed under general anesthesia. (See **Anesthesia Protocols for Urethral Deobstruction**.) All patients should receive pain medication. A novel method of pain control using a coccygeal epidural block may also be beneficial in these patients and can be considered.[3]

Vocalization or movement during catheterization indicates insufficient sedation and is more likely to be associated with significant urethral spasm and increased risk for urethral trauma. In these patients, administer higher doses of medications or provide additional analgesics and/or sedatives. Less experienced clinicians may prefer using general anesthesia because it provides longer sedation than injectable medications, allowing more time to complete the procedure. Whether using sedation or anesthesia with intubation, the patient should be monitored (eg, ECG, blood pressure, pulse oximetry) commensurate with clinical status/instability and standard of care.

Placing one catheter that can be used both for deobstruction and ongoing management may cause less urethral trauma.

Catheter Type & Size

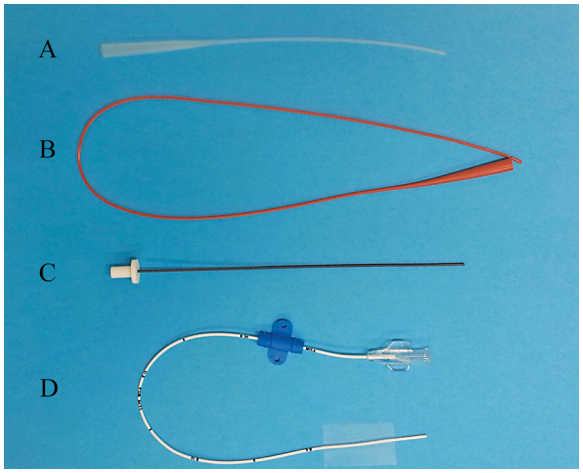
An open-ended catheter made of polypropylene, polytetrafluoroethylene, or polyurethane is typically used to relieve the obstruction. (See **Figure 1**.) Polypropylene catheters are the most rigid, which may make them more effective in relieving an obstruction; however, they are more likely to cause urethral trauma, especially if excessive force is used during placement. Because polypropylene catheters can also be more reactive and irritating,[4] they should not be left in place for ongoing management.

Polytetrafluoroethylene and polyurethane catheters are firmer at room temperature, which facilitates initial unblocking efforts, and they soften when warmed to body temperature, which allows them to be left in place. Placing one catheter that can be used both for deobstruction and ongoing management may cause less urethral trauma.

Consider catheter size when selecting the type of catheter for deobstruction. One retrospective study found that patients unblocked with a 5Fr catheter compared with a 3.5Fr catheter had increased risk for reobstruction within 24 hours (19% vs 6.7%, respectively), which suggested a benefit in using a smaller catheter; however, the potential for confounding factors to have affected the results is significant.[5] Another study failed to find an association with catheter size and risk for reobstruction.[6] These results suggest the impact of catheter size is unclear.

Preparation

Make sure different types and sizes of catheters are readily available before starting deobstruction. Ideally, start with the smallest and most flexible catheter. Determine the length of the catheter needed



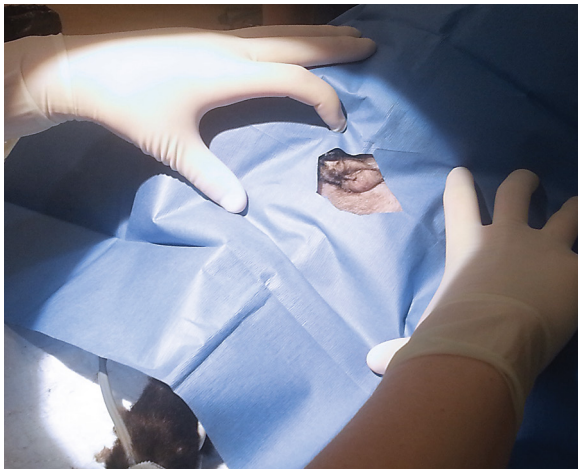
▲ **FIGURE 1** Urinary catheters may be made of polypropylene (**A**), polyvinyl (**B**), polytetrafluoroethylene (**C**), and polyurethane (**D**). Polyvinyl catheters are not open-ended and therefore not typically used for unblocking but can be placed long-term. Polypropylene catheters are not suitable for long-term placement because of their potential to irritate.

Photos courtesy of Edward Cooper, VMD, MS, DACVECC

TAKE ACTION

1. Provide adequate pain control and sedation or anesthesia for all patients requiring urethral deobstruction.
2. Use lubricated sterile flush to lubricate the entire urethra.
3. Advance the urinary catheter using minimal force.
4. Use the softest catheter possible to unblock, and never leave a polypropylene catheter in place after the obstruction is relieved.

Before discharge, the patient should pass urine on at least one to 2 occasions and the bladder should be normal size.



▲ **FIGURE 2** Placing a sterile drape over the perineal region helps reduce the risk for contamination during catheter placement. This patient is in dorsal recumbency.

▲ **FIGURE 3** 1 ml to 2 ml of sterile lube is placed into a 20 mL syringe, which is then connected to a 3-way stopcock. Another syringe with 10 ml to 20 ml sterile saline is also connected and the 2 syringes are mixed across the 3-way stopcock to create the lubricated flush. Extension tubing can then be used to connect to the urinary catheter to allow flexibility.

to reach the urinary bladder by measuring from the penis to the level of the fourth mammary gland.

Following sedation and anesthetization, place the patient in lateral, dorsal, or ventral recumbency, depending on veterinarian preference. Clip the perineal region, prepare the region using aseptic technique, and apply a sterile drape with an opening over the perineum to minimize risk for contamination. (See **Figure 2**.)

Assemble a flushing system to allow hydropulsion and urethral dilation during catheter placement. Mixing sterile saline and sterile lubricant (10:1) using 2 syringes across a 3-way stopcock (see **Figure 3**) will allow lubricant to be deposited along the entire length of the urethra during flushing, which may help decrease urethral trauma.

Catheterization

Wear sterile gloves during catheter placement. The team member placing the catheter or the assistant can extrude the penis by using pressure on either side, or above and below, and pushing cranially and dorsally. Once the penis is exposed, inspect the tip for a plug or debris and gently massage the tip to remove any lodged material.

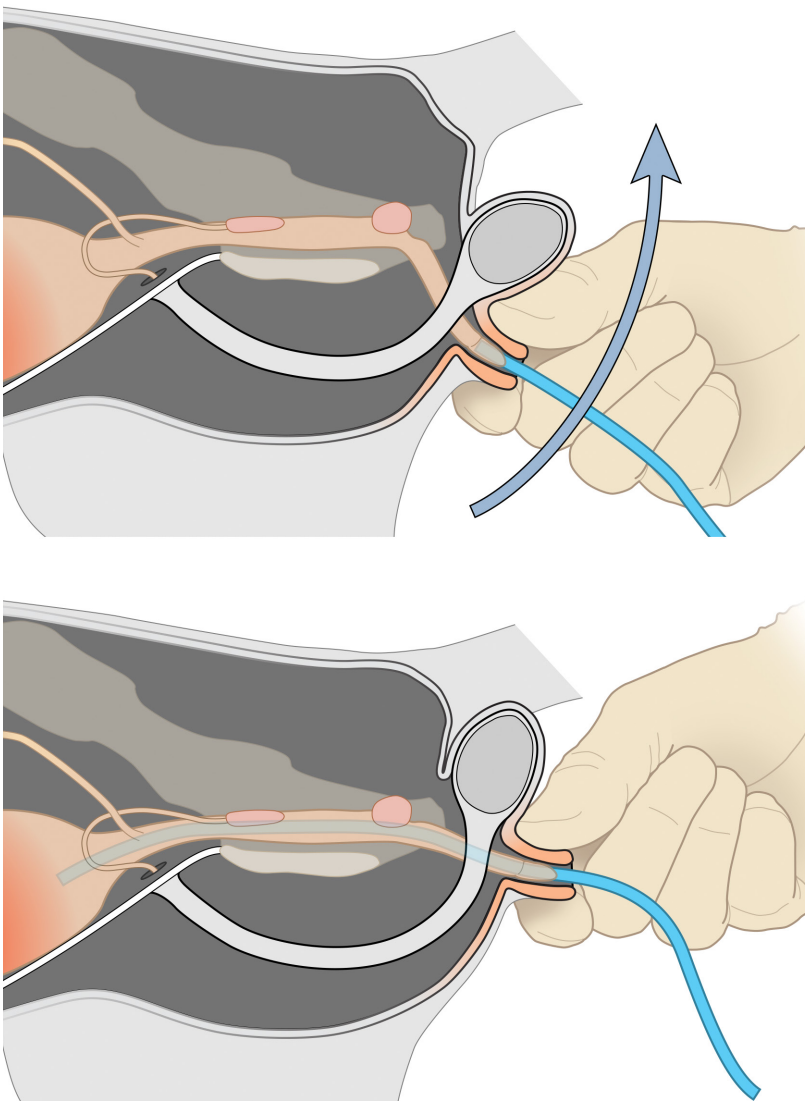
Introduce the lubricated catheter tip into the penile urethra. Maintain gentle cranial pressure on the catheter and grasp and retract the prepuce caudally or caudodorsally to straighten the urethra, which will make it easier to place the catheter and cause less trauma. (See **Figure 4**.) Gently advance the catheter using minimal force while hydropulsing the lubricated flush. If an obstruction is encountered, use a soft, rapid, back-and-forth (ie, chipping) motion while aggressively flushing until the

catheter reaches the bladder. Gentle back-and-forth rotation of the catheter against the obstruction may also be helpful. Do not force the catheter past an obstruction. Stop if repeated efforts to clear the obstruction are unsuccessful or the veterinarian is concerned about a urethral tear.

Referral to a specialty practice that can perform more advanced catheterization techniques may be required. In these circumstances, consider performing a decompressive cystocentesis until other interventions can be performed.

Once the catheter has been placed successfully, empty and flush the urinary bladder until the effluent is relatively clear of blood and gross debris. If a polypropylene catheter was used for deobstruction, replace it with a softer, indwelling catheter that should then be secured appropriately based on the type of catheter. Confirm appropriate catheter placement using abdominal radiography or ultrasonography and visualization of urine flow through the catheter. Imaging will also help identify bladder stones and free abdominal fluid. Connect the catheter to a closed sterile collection system to facilitate monitoring of urine production and decrease the risk for ascending infection, which is more likely to occur with an open system.[7]

Always wear gloves when handling the closed collection system, which should



▲ **FIGURE 4** This schematic displays a useful technique for facilitating deobstruction and passage of the catheter. After inserting the tip of the catheter in the penile urethra, the prepuce is pinched and pulled caudally or caudodorsally to straighten the urethra.

Illustration by Tim Vojt. Reprinted by permission, The Ohio State University

not be placed on a bare floor. An E-collar will prevent the patient from dislodging the catheter.

Some clinicians mandate the catheter remain in place for a minimal period to allow resolution of inflammation and clearing of debris, clots, and/or crystals. However, a urinary catheter can irritate the urethral epithelium and potentially contribute to lower urinary tract inflammation.[4] Length of catheterization should be based on clinical criteria (eg, resolution of biochemical abnormalities and postobstructive diuresis [if present], gross character of the urine [clear vs gritty vs hemorrhagic]). As reobstruction may occur, the patient should be monitored for some time after the catheter has been removed. Before discharge, the patient should pass urine on at least one to 2 occasions and the bladder should be normal size.

Conclusion

Treatment of urethral obstruction often requires placement of a urinary catheter to restore urethral patency. Several catheter types and sizes are available; the appropriate catheter should be selected based on the patient's needs. Sedation and analgesia should be administered to all patients to provide pain relief and relaxation and help minimize urethral trauma during deobstruction. Patients with stable vital signs can receive general anesthesia. Because reobstruction may occur, patients should be monitored to ensure they have normal urinary function before discharge.

Make sure different types and sizes of catheters are readily available.

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EDWARD COOPER, VMD, MS, DACVECC, has served on the faculty of The Ohio State University College of Veterinary Medicine since 2007. He graduated from University of Pennsylvania School of Veterinary Medicine in 2002 and completed a 1-year rotating internship at Michigan State University in 2003. Edward completed a specialty internship in emergency medicine and was then accepted into a small animal emergency and critical care medicine residency at The Ohio State University. In 2007, he achieved board certification as a Diplomate of the American College of Veterinary Emergency and Critical Care Medicine. His research focus includes feline urethral obstruction, and he has published several journal articles and an invited book chapter on the topic.

FUN FACT: Fitting with his adrenaline-driven ECC mentality, Edward recently went skydiving for the first time—a truly amazing experience, he said. His wife and children appreciate that he landed safely!

Follow the Law

Do You Know Who Can Deobstruct Cats in Your State?

Lance M. Roasa, DVM, MS, JD
The Roasa Law Group
Raymond, Nebraska

State veterinary practice acts describe who can perform common procedures but rarely specify "blocked male cats."[1] You must read between the lines of your state's laws to determine who may perform a deobstruction.

Most States Blur the Language

Most states follow language that seemingly allows a veterinarian to "delegate veterinary care and treatment duties to nonveterinary employees" after examination and establishment of a veterinarian–client–patient relationship.[2] In similar statutes, delegating the deobstruction of a blocked male cat to a skilled, experienced veterinary nurse, with some level of supervision, is not specifically prohibited.

However, this is subject to the "standard of care" determined on a case-by-case basis. When deciding on the level of delegation and supervision, the veterinarian should "consider the … level of training and experience of the nonveterinarian."[2] Should a urethral perforation occur, the state veterinary licensing board or a court would look to an expert witness to determine what an "ordinary and prudent veterinarian" would do in a similar situation.

Other States & Specific Language

Some states are specific about the tasks a licensed veterinary technician can perform (see **States with Specific Language**) with "catheterization of an *unobstructed* bladder" listed as one of the permitted tasks.[3] For example, Alabama and Washington do not

See related articles, **Urethral Obstruction in Cats**, page 37, and **Urethral Deobstruction in Cats**, page 55

States with Specific Language Regarding Urinary Catheterization

The following states use specific language regarding urinary catheterization by a veterinary nurse and a certified veterinary technician (CVT)[3]:

- **Alabama:** Allows "catheterization of the unobstructed bladder"
- **Delaware:** Allows urinary catheterization but specifically prohibits veterinary nurses from performing urethral catheterization "in the case of known urinary blockage"
- **Illinois:** A CVT can perform "urinary catheterization for a blocked male cat"
- **Nebraska:** A CVT can perform "collection of urine by catheterization"
- **Nevada:** Veterinary nurses can catheterize only an "unobstructed bladder"
- **North Dakota:** Allows veterinary nurses to "catheterize the urinary bladder"
- **South Carolina:** A CVT may "collect urine by catheterization"
- **Washington:** A CVT may place an "unobstructed bladder catheter"

Note: Although complete at the time of publication, this list is not a substitute for legal advice, so check your own state's statutes for laws impacting your practice.

If you need help understanding the language of your state's statutes, contact the author at **lance@roasalaw.com**

specifically prohibit catheterization of an *obstructed* bladder; the general interpretation is that the legislature *intended* prohibition by not using language specifically allowing a veterinary nurse to catheterize a blocked urethra. Convincing a state board or jury otherwise would be an uphill argument.

Conclusion

Before the next blocked cat is on your practice treatment table, make sure you brush the dust off your state's practice act and determine where the language sits.

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LANCE M. ROASA, DVM, MS, JD, teaches veterinary law and ethics at 10 US veterinary colleges and serves veterinarians' legal needs through his law practice. He earned his DVM from Texas A&M University and his law degree from University of Nebraska. Veterinary medicine is his favorite profession, and he continues to practice emergency medicine and perform traveling surgery. Lance also owns and manages a group of midwestern veterinary practices. He is a coadvisor to the national Veterinary Business Management Association and president-elect of the American Veterinary Medical Law Association.

FUN FACT: To keep up with a hectic travel schedule of teaching at veterinary schools and consulting with veterinary practices, Lance pilots his 1969 Cessna Skylane around the country. Look for him overhead!