RESEARCH AND INNOVATION
ANIMAL RESOURCES AND CARE
VIRGINIA TECH

Standard Operating Procedure: Urinary Catheter in Dogs and Cats

These SOPs were developed by the Office of the University Veterinarian and reviewed by Virginia Tech IACUC to provide a reference and guidance to investigators during protocol preparation and IACUC reviewers during protocol review. They can be used as referenced descriptions for procedures on IACUC protocols. However, it is the sole responsibility of the Principal Investigator to ensure that the referenced SOPs adequately cover and accurately represent procedures to be undertaken in any research project. Any modification to procedure as described in the SOP must be outlined in each IACUC protocol application (e.g. if the Principal Investigator plans to use a needle size that is not referenced in the SOP, simply state that alteration in the IACUC protocol itself).

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I. Procedure Summary & Goal

a. Urinary catheterization is a technique used in veterinary medicine.

   i. Collection of diagnostic samples.

   ii. Performance of diagnostic imaging techniques.

   iii. Provide therapeutic resolution of excessive urinary retention.

b. The process of urinary catheterization is technically simple, though the principles of sterility and proper technique are important concepts for veterinarians to understand and to be able to perform in their everyday practice.

II. Personal Protective Equipment & Hygiene

a. Hands should be washed thoroughly or sanitized before and after the procedure.

b. Personal protective equipment appropriate to the setting should be used.

III. Supply List

a. Urinary Catheter

   i. Size and material depend on intended duration and use of catheter

      1. 3.5 to 12 French catheters for single use

      2. Foley catheters for long term retention

b. Electric clippers

c. #40 clipper blade

d. Surgical scrub (betadine or chlorhexidine)

e. Sterile saline or sterile water

f. Syringe(s), 1---12ml

g. 2% Lidocaine injectable or lidocaine jelly

h. Sterile lubricant

i. Exam gloves

j. Sterile gloves

k. Gauze pads

l. Bowl

m. +/- Disinfected vaginal speculum or otoscopic speculum

n. +/- Sterile drape

o. Tape/suture to secure catheter

p. Extension line or IV fluid administration set

q. Collection bag

r. Elizabethan collar

IV. Detailed Procedure

a. General Preparation

i. Urinary catheter placement is a clean technique, not a sterile technique.

ii. Clip the long hair from the vulva or the distal aspect of the prepuce and the ventral aspect of the abdomen to maintain a hair---free area of at least 2 inches surrounding the catheter insertion site. Note: clipping hair closely may result in more issues related to abrasions and licking at region – clip any long hair away

iii. Wash hands and put on examination gloves.

iv. Using chlorhexidine scrub and sterile water or sterile saline, gently cleanse the vulva.

v. Flush the vestibule or prepuce 5 times with 0.05% chlorhexidine solution (or dilute betadine solution). Use an appropriate volume for the size of the patient: 1mL for smaller patients up to 10 mL in larger patients.

vi. In male patients, clean the prepuce using 3 to 5 mL of 0.05% chlorhexidine solution and sterile water or saline and then flush as described above.

vii. In female patients, instill 1 ml of 2% lidocaine or 0.5---3ml of lidocaine jelly with a sterile syringe into the vestibule. Remove the examination gloves and replace them with sterile gloves, maintaining a sterile technique.

viii. Check the catheter balloon (for Foley catheters) integrity by injecting the balloon port with sterile saline.

ix. Lubricate an appropriately sized, sterile catheter with sterile lubricating jelly.

x. Cut the end of the sterilized catheter package near the insertion tip end of the catheter.

xi. Cut off another portion of the package, about 1---2 inches away from the first cut, so you can manipulate the catheter while keeping it covered with the sterilized packaging during insertion into the urethra.

xii. Do not allow the catheter to touch anything except the sterile packaging, and eventually the patient's urethra.

b. Male Dog

i. Position

1. Lateral recumbency or standing.

ii. Preparation

1. Sedation is generally not required.

2. Extrude the penis from the prepuce and wipe the urethral orifice, keeping the penis extended.
3. Measure the approximate length of catheter (tip of penis to pelvic brim)
4. Lubricate the tip of the catheter with sterile jelly
5. Slide the catheter through the penile urethra the previously estimated length of the urethra.
    a. Stop insertion when urine begins to fill the catheter or leaks from the end of the catheter.
6. Once you have entered the urinary bladder, release the penis into the prepuce.

c. Male Cat

i. Position

1. Dorsal or lateral recumbency

ii. Preparation

1. Sedation is generally required
    a. Follow the Sedation and Anesthesia SOP
2. Extrude the penis by placing gentle pressure on the prepuce towards the spine.
    a. Gauze sponges may be used to aid in applying traction.
    b. Urinary catheters in cats are difficult procedures to do alone. Be sure to have an assistant.
3. Lubricate a sterile catheter with sterile lubricating jelly and insert it into the penile urethra.
4. Advance the catheter until urine is noted in the catheter lumen, or is visible upon aspiration with a syringe.

d. Female Dog or Cat

i. Position

1. Lateral, dorsal, or sternal recumbency.

ii. Preparation

1. See above, general preparation.

iii. Methods

1. Blind Method
    a. Estimate the length of catheter.
        1. Landmarks: brim of pelvis to the (lips of vulva) vaginal vault.
    b. Spread the vulvar lips and place the urinary catheter just dorsal to the clitoral fossa on the midline and slowly advance.

c. The catheter may be passed into the urethral orifice by handling it in its sterile protective package.

d. Resistance will be met if the catheter enters the vagina and not the urinary bladder.

e. Urine will usually appear in the urinary catheter when the catheter is in the urinary bladder.

2. Visual Method

a. Otoscope

1. Insert the catheter on the ventral floor of the otoscope cone, directly into the urethral orifice.

2. Handle the catheter in its package material to keep the procedure as clean as possible.

3. Once the catheter is in the urethra, pull the otoscope cone out and over the urethral catheter.

b. Speculum

1. Introduce the speculum into the vaginal vault in an inverted position.

1. This will keep the speculum out of the way so you can visualize the orifice.

2. Additional light may be needed to adequately view the orifice.

3. Once the urethral orifice is visualized the urinary catheter is introduced and advanced.

4. Sterile gloves may be needed in order to better manipulate the catheter while maintaining a clean procedure.

3. Digital Method

a. With exam gloves, place a finger within the vaginal vault.

b. In medium to large dogs, a slight enlargement on the midline ventral floor of the vaginal vault is palpable.

c. Introduce the urinary catheter ventral to the finger and guide it into the urethral orifice.

d. Once the catheter is in the urethra, it will no longer be palpable.

V. Potential Adverse Effects, Mitigation, or Treatment

a. Urinary tract inflammation/ mild trauma; usually resolves without complications

b. Urinary tract infection; Perform urine culture/sensitivity and/or antibiotic therapy if suspected

c. Perforation of urethra or bladder

i. Leads to urine extravasation into tissues, peritoneal or retroperitoneal cavities

ii. This complication could require diagnostic imaging to localize the perforation and determine if the placement of a retention catheter or surgical correction of the perforation would be most appropriate.

iii. Animals should be taken to the Veterinary Teaching Hospital for treatment or for euthanasia by pentobarbital overdose intravenously (IV) depending on the policies of the Multidisciplinary Laboratory (MDL), the Teaching and Research Animal Care Support Service (TRACSS) and the Institutional Animal Care and Use Committee (IACUC).

d. Avoidance Measures:

i. urinary catheters should be an appropriate size for intermittent catheterization technique

ii. catheters should be adequately lubricated

iii. flushing of prepuce and vaginal vault should be performed prior to catheterization

iv. sterile technique should be attempted and can usually be accomplished in the male but is difficult to accomplish in the female.

VI. Variations

a. Attachment of a urine collection system

i. Closed collection systems

1. Open a sterile Bard collection bag and aseptically attach the Foley catheter to the bag.

ii. Open collection systems

1. Attach a macrodrip IV set to the catheter then attach a recently new drained, IV fluid bag to the end of the macrodrip set.

2. Test the catheter placement by applying gentle caudal traction.

3. Secure the catheter to the patient with 3-0 nylon suture.

b. Securing the Urinary Catheter

i. If using a Foley catheter, inflate the catheter balloon with the needed volume of sterile saline solution indicated on the catheter.

ii. Secure with tape and/or nylon suture to body wall.

c. Removing urine via an open collection system.

i. Wash hands and put on examination gloves.

ii. Obtain a drained, new IV fluid bag.

iii. While holding the urine collection bag off the floor, disconnect the fluid bag, save the collected urine for quantification, and discard the used bag.

iv. Attach the new fluid bag to the macrodrip set and ensure all urinary catheter connections are tight.

v. Rest bag on the floor on top of a clean tray.

vi. Urine should be removed every 4-8 hours or as dictated by the primary clinician.

d. Removing urine via a closed collection system

i. Wash hands and put on examination gloves.

ii. Place the bag's exterior drainage tubing into a clean collection chamber, such as a sterile measuring cup.

iii. Open the tubing valve to allow urine to flow from the bag into the measuring cup.

iv. After all urine has drained, close the tubing valve and secure the tubing at the appropriate place(s).

v. Ensure all urinary catheter connections are tight and rest bag on the floor on top of a clean tray.

vi. Urine should be removed every 4-8 hours or as dictated by the primary clinician.

VII. Links to Multimedia Aids and References

a. http://www.vetmed.wsu.edu/resources/Techniques/urinary.aspx

b. http://veterinarycalendar.dvm360.com/avhc/Medicine/Placing-and-managing-urinary-catheters-and-cathete/ArticleStandard/Article/detail/608427