

## **Urethral Catheterization in the Female Dog Made Easy**

Jamie M. Burkitt-Creedon, DVM, Dipl. ACVECC, Critical Consultations

Urethral catheterization in the female dog is a straightforward, useful procedure that can be mastered if one has good technique and the opportunity to practice. I recommend a blind digital technique because it is reliable, requires minimal equipment, and doesn't result in an over-the-catheter otoscope cone remaining in place to collect microbes. The most important aspects for success with this technique are knowledge of the female urogenital anatomy, proper patient positioning, and proper operator arm positioning.

### Setting up

Gather all supplies ahead of time; 1-2 assistants will be needed. Most dogs do not require sedation for this technique in my experience. The patient should be placed in lateral recumbency. If the operator is right-handed, the dog should be in right lateral recumbency (and vice versa) with its perineal area 1-2" from the edge of the table. Hair should be clipped at least 5cm in each direction from the vulvar lips, and the skin aseptically prepared with chlorhexidine scrub and water. The vestibule should be flushed five times with a 0.05% chlorhexidine solution. Instill a few ml of sterile lidocaine jelly into the vestibule, with attention to total lidocaine dose for patient size. Strict aseptic technique is important, including proper hand hygiene, and the use of sterile gloves, sterile supplies, and barrier draping.

### Anatomy

The urethral opening lies on ventral midline in the cranial aspect of the vestibule (the anatomic region shared by the urinary and genital systems in the female). There is often a tissue band or stricture at the vestibulovaginal junction – the urethral opening is immediately caudal & ventral to this structure in most dogs. If there is no stricture, a handy rule of thumb is that, even in large dogs, if your finger is inserted beyond the second knuckle, you are probably in too far. There is often a mound of tissue that lies over and may cover the urethral opening, though some dogs do not have a distinct papilla but rather just a palpable opening. See Figure 1 for more anatomical information.

### Catheter Placement

The first step is to digitally palpate the urethral opening without a catheter in hand. Use the index finger unless a smaller finger must be used due to patient size, and palpate the opening to orient yourself. Remember when you enter the vulvar lips that a blind pouch, the clitoral fossa, lies directly cranial to your fingertip. Dogs resent palpation of this area, and it should be avoided. Thus, after inserting the index finger between the vulvar lips, immediately aim the finger dorsally toward the anus until the finger passes over the pelvic brim (See Figures 2 and 3). When your fingertip passes over the pelvic brim, rotate your arm so that the index finger points directly cranially, keeping your arm in a straight line from the fingertip to the elbow. This straight-wrist technique seems to

be crucial for success; a bent wrist will almost always result in a failed catheterization attempt. Once you have rotated your arm with a straight wrist such that your index fingertip is over the pelvic brim, the urethral papilla is usually directly under or 1-2cm cranial to your fingertip. Identify it digitally. After you have identified the opening, remove your finger, and reinsert it using the exact same technique, this time with the catheter held on the midline palmar surface of your index finger. The catheter tip should be 1-2mm caudal to your fingertip. As you advance over the pelvic brim and your fingertip feels the papilla again (See Figure 4), use the pad of your fingertip to gently guide the catheter tip ventrally into the urethral opening (See Figure 5). Do not compress the papilla with your finger, or the catheter will not advance because you will be holding off the urethra. Use the non-dominant hand to help push the catheter forward, maintaining sterile technique at all times. Once the catheter dives ventrally away from your fingertip, it has entered the urethra (See Figure 6). Advance until urine flows from the catheter, or until the catheter tip has been advanced to the cranial aspect of the pubis. If you are uncertain that the catheter is in the urethra, use your finger to palpate the dog's stricture or vestibulovaginal junction again – if the catheter tip is not palpable and the catheter is not felt passing into these structures, it is in the urethra.

Asepsis is crucial, particularly if the catheter is to remain indwelling; research has shown that urethral catheter-associated infections increase as dwell time increases, so the catheter should also be removed once it is no longer medically necessary.



Figure 1. Contrast vaginourethrogram showing the relevant anatomy in the female dog. A metal-dense forcep is holding the vulvar lips closed. Note that a contrast-filled urethral catheter enters the urethral opening well dorsal to the vulvar lips, avoiding the clitoral fossa. The urethral opening can be seen just caudal to the pelvic brim in this dog. Note the narrowed contrast filling at this dog's vestibulovaginal junction, consistent with a stricture or tissue band narrowing the aperture. As expected, the urethral opening is just caudal to this narrowing. (This material is reproduced with permission of John Wiley & Sons, Inc. from Aldrich, J. Urethral catheterization, in Advanced

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Figure 2. Cadaver preparation: a midline sagittal section of a female dog. Cranial is to the left, dorsal is to the top. The finger is first inserted in a cranial direction just into the vulvar lips.



Figure 3. Immediately after passing through the vulvar lips, the finger is directed dorsally, up and over the pelvic brim.



Figure 4. The catheter tip is at the urethral opening, and the urethral papilla can be seen immediately cranial to the catheter tip. The operator's arm is straight from fingertip-to-elbow at this point.



Figure 5. The pad of the fingertip to gently guide the catheter tip ventrally into the urethral opening.



Figure 6. The catheter tip is now inside the urethral opening. The index finger continues to provide gentle forward propulsion and the non-dominant hand is seen guiding the catheter into the vulva.