



# Endoscopic vaginoscopy in the dog

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## Abstract

Vaginoscopy is a useful diagnostic procedure for evaluating the nature and extent of disease in the vestibule and vagina of female dogs. Using flexible or rigid endoscopes improves the operator's capability to detect disease because of improved illumination and magnification while facilitating vaginal distension. The size of the scope should be appropriate for the size of the patient. Although a variety of positions are suitable, we place anesthetized dogs in dorsal recumbency to minimize inadvertent contamination of the operative field with feces. If the urinary tract will also be examined, evaluate the urethra and urinary bladder first and then the vagina. After the reproductive tract is examined, tissue biopsies can be obtained for microscopic evaluation.

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## 1. Introduction

Vaginoscopy is essential for diagnosing reproductive anomalies, evaluating the severity of vaginal trauma, determining the source of vulvar discharge, and detecting reproductive-related causes of urinary incontinence and recurrent urinary tract infection [1,2]. In the normal animal, vaginoscopy is useful for determining the stage of the estrous cycle and performing transcervical artificial insemination.

Vaginoscopy using a vaginal speculum or otoscope is a simple and easy procedure to perform in most dogs. However, the disadvantages of this technique are lack of distension of the vagina and limited visualization cranial to the cingulum (Fig. 1). Although the use of pediatric proctoscopes can permit distension of the distal reproductive tract with air, maintaining distension during biopsy is difficult. Endoscopic vaginoscopy, using flexible endoscopes or rigid cystoscopes, can

overcome these limitations, providing additional diagnostic and therapeutic opportunities for veterinarians managing female dogs with vestibulovaginal disorders.

## 2. Equipment

Endoscopic vaginoscopy can be performed with flexible or rigid endoscopes. Endoscopes with the camera positioned on the tip of the scope (CYF-V/VA Flexible Video-Cystoscope, Olympus Surgical & Industrial America Inc., Orangeburg, NY, USA) provide superior image quality compared to images viewed through scopes offering fiber optic viewing. Because video scopes are relatively expensive and their excessive length may render them difficult to manage, rigid cystoscopes provide a less expensive, but suitable alternative.

Rigid cystoscopes are available in a variety of sizes (Endoscopy Support Services Inc., Brewster, NY, USA and Karl Storz Veterinary Endoscopy-America, Goleta, CA, USA). Smaller scopes are easier to manipulate, but may be of insufficient length to reach the cervix.

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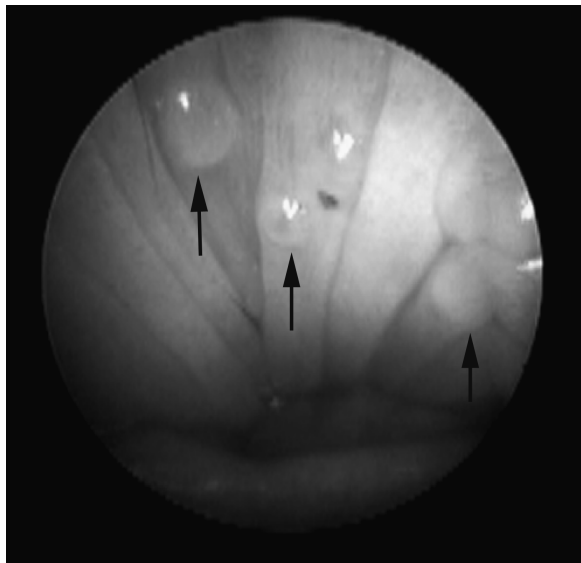


Fig. 1. Mucosal follicles (arrows) on the dorsal surface of the vestibule in a 2-year-old mixed breed dog viewed using an otoscope.

Therefore, we recommend that several sizes be available. The 2.7 mm diameter scope with a 14.5 Fr outer sheath is 18 cm long. This scope is used to examine dogs less than approximately 10 kg. If resources permit the purchase of only one scope, consider the 4 mm diameter cystoscope. It is 32 cm long and has a 17 Fr outer sheath. If transcervical artificial insemination is to be performed in large-breed dogs, a longer scope is recommended (3.5 mm  $\times$  36.5 cm long with a 22 Fr sheath).

The viewing lens of rigid cystoscopes is available with a variety of viewing angles. Most cystoscopes used by veterinary urologists have a lens with a 30°, upward deflection. This deflection allows superior viewing of the lateral walls, but the tip of the scope needs to be lowered to obtain a better perspective of structures directly in front of the scope. If possible, also consider obtaining a scope with zero deflection image viewing. The cystoscope sheath will accommodate all scopes of the same size, irrespective of image deflection. Therefore, an additional sheath is not needed. Although most scopes allow viewing through the eyepiece, attach an endoscopic camera (Endoscopy Support Services Inc.) to the eyepiece to enhance viewer comfort. In addition, the video camera will provide image magnification and image capture.

### 3. Procedure

Endoscopic vaginoscopy is performed in anesthetized dogs. To minimize unforeseen complications

associated with anesthesia, insure that preanesthetic laboratory test results and proper patient fasting are suitable for the procedure. For dogs with excessive or long hair, clip perivulvar hair and wrap the tail to minimize contamination of the working area. The perivulvar skin is cleansed with antiseptic surgical scrub, followed by a final application of betadine spray. There is no need to cleanse the inside of the vestibule; fluid instilled during vaginoscopy will wash debris from the vestibule.

Although vaginoscopy can be performed in lateral or ventral recumbency, to minimize inadvertent fecal contamination from the rectum, we routinely position dogs in dorsal recumbency. This will also allow the tail of the patient to naturally lie below the operator's working field. The pelvis of the dog is positioned at the end of the table and the rear legs are secured in a loose, frog-leg configuration. A fenestrated drape covers the dog with the vulva exposed.

Using sterile gloves, the endoscopist assembles the cystoscope and attaches tubing for irrigation fluids. Apply a water-soluble lubricant to the sides of the tip of the scope before passing it between the vulvar folds and into the vestibule. To avoid the clitoris and clitoral fossa, initially pass the scope with the tip acutely angled down toward the spine of the dog. Once inside, distend the vestibule with sterile, warm, isotonic fluids (e.g. normal saline, LRS, etc.) by opening the irrigation port on the scope. If a gastroscope is used, room air or carbon dioxide is used to distend the vestibule. To prevent loss of fluid during insufflation, use your thumb and first finger to lightly occlude the vulvar commissure around the tip of the scope. The seal should be tight enough to allow solutions to distend the vagina, but not so excessive that it hinders cranial passage of the scope. Because a complete seal is not necessary and difficult to maintain, continue to provide a steady stream of fluid or air to maintain vaginal distension; the fill rate can be adjusted as needed to maintain vaginal distension.

With the scope inserted just passed the vulvar commissure, the vestibulovaginal junction (ovoid configuration) and urethral os (circular opening) are easily identified. When the patient is in dorsal recumbency, the urethral os is above the vestibulovaginal junction (Fig. 2). Also note that the opening at the vestibulovaginal junction is wider than the urethral opening. If the urinary tract is to be examined at the same time, strive to evaluate the urethra and urinary bladder first. This order is suggested because the urinary tract has fewer commensal and pathogenic microorganisms than the vagina. However, we are not aware of any studies verifying this presumption.

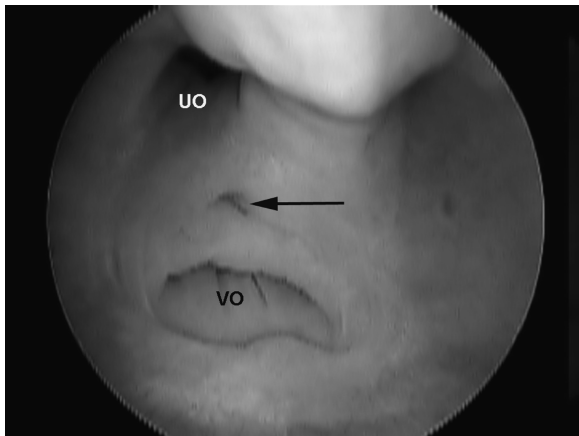


Fig. 2. Endoscopic view of the vestibule in a 1.5-year-old mixed breed dog with urinary incontinence since birth. Between the urethral os (UO) and vaginal os (VO) is the anomalous termination of the left ectopic ureter (arrow).

The vestibule is examined for the presence of foreign material, mucosal lesions, hyperemia, blood, and anatomic abnormalities (Fig. 2). Besides occasional foreign material and mucosal follicles, we rarely find abnormalities of the vestibule. In young dogs with urinary incontinence you may observe vaginal termination of ectopic ureters (Fig. 2). In older dogs, urethral tumors may be observed protruding through or distorting the urethral os.

When examining the vestibulovaginal junction, it should be a single, smooth, continuous, symmetrical, and distensible opening. Asymmetry is an indication for the presence of localized tumors, infections, or trauma (Fig. 3). A smaller, minimally distensible opening is consistent with a vestibulovaginal stricture. When the vestibulovaginal junction is divided into two or more openings consider a diagnosis of vaginal septa or vaginal duplication.

With fluid continuously flowing, advance the scope through the cingulum and into the vagina. The scope should only be advanced while visualizing its path on the video monitor (i.e. avoid looking directly at the scope or the dog). This will avoid unexpected trauma to the vagina. Lead the scope through the center of the lumen, not against or into the wall of the vagina. Lesions in the wall of the vagina can be examined more thoroughly by rotating or changing the angle of the scope once the desired destination has been reached. After the scope reaches the cervix, it cannot be advanced any further. In dogs with urinary incontinence, examine this area thoroughly for the termination of ectopic ureters and the expulsion of urine [3].

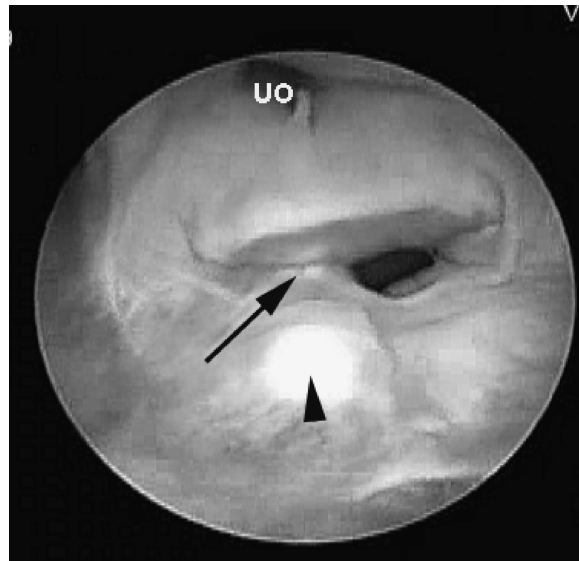


Fig. 3. Endoscopic view of the distorted and undistensible vaginal os (arrow) in a 9-year-old female/spayed Rottweiler with dysuria. A firm mass was palpated and visualized (arrow head) on the dorsal right vestibule. UO = urethral os.

With visual examination complete, there are several methods of obtaining a biopsy. Long 22 or 25 gauge needles can be passed through the biopsy channel of the cystoscope to obtain fine needle aspirates. In a similar manner, small biopsy forceps can be directed through the biopsy channel. This technique is ideal for retrieving samples of the vaginal mucosa. To obtain larger samples extending below the mucosa, insert larger biopsy forceps (i.e. the diameter of large biopsy instruments are too wide to pass through biopsy ports) along side the scope to visualize tissue collection. In addition, the cystoscope can be used to direct specialized scissors, lasers, cautery, graspers, and balloon dilators to correct vestibulovaginal disorders.

#### 4. Post-procedure care

At the termination of the procedure, there is no need to evacuate fluid or air from the vagina; it will dissipate without assistance. If excessive fluid is retained in the urinary tract, drain it with the cystoscope or manual expression of the bladder.

Although precautions are undertaken to keep the procedure as clean as possible, it is rarely a sterile process. We are unaware of infections associated with vaginoscopy. Nonetheless, we routinely administer a broad-spectrum antimicrobial for 3–5 days to reduce the risk of iatrogenic infection.

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