

# Uroendoscopy

## COMPLICATIONS

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**UROENDOSCOPY** is the term that describes endoscopic examination and evaluation of the vestibule, urethral meatus, urethra, trigone, and bladder. It can also include evaluation of the vagina, usually performed at the end of the examination. Uroendoscopy is a valuable diagnostic tool for many lower urinary tract disorders (Table). It is the gold standard for the diagnosis of ectopic ureter(s) and for determining the termination point for ectopia. Definitive knowledge of the termination point is important to ensure that the best surgery is done for an individual patient. Uroendoscopy is useful for definitive evaluation of the lower urinary tract for anatomical abnormalities, including stricture, neoplasm, polyp, urachal diverticulum, and inflammatory lesions. It is also very sensitive for initial detection of transitional cell tumors and is often positive for such when double-contrast cystography and ultrasonography are negative.

Uroendoscopy is an important tool for evaluation of patients with recurrent bacterial urinary tract infection to exclude the presence of anatomical abnormalities. It allows for visualization of "glomerulations" in cats with interstitial cystitis at low pressure or following a provocative maneuver to increase bladder pressure. Normal results on uroendoscopy can be important in providing information suggesting that inappropriate urination in cats is due to a behavior disorder.

Interventional uroendoscopy to administer submucosal urethral injections of collagen for treatment of primary sphincter mechanism incompetence, removal of small polyps, basket retrieval of small uroliths, and laser lithotripsy can be successful in some cases. Uroendoscopy is quite helpful and efficient in evaluating the effectiveness of voiding urohydropropulsion for evacuation of small bladder stones in female dogs and cats.

### Evaluating the Urethrocystoscopy

The finding of normal and abnormal structures or anatomy should be specifically noted. Standardized filling pressures during examination of the bladder and measurement of filling volumes to achieve the desired pressure are encouraged to gain as much diagnostic information as possible.



The most common complication is the inability to enter the urethra and bladder due to a cystoscope that is too large. A variety of scope diameters and lengths are necessary to allow complete diagnostic evaluation of animals of all sizes.

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## Lower Urinary Tract Disorders in Which Cystoscopy is Useful

### Females

- Urinary incontinence—exclude structural/anatomical problems
- Documentation of small cystic/urethral calculi
- Postvoiding hydroexpulsion of calculi—document completeness
- Assessment of anatomy—vagina, urethra, bladder
  - Vaginal stricture, septae, persistent hymen
  - External urethral orifice
  - Bladder diverticulum
  - Trigonal structure
  - Ureteral orifices—location and appearance
- Identify inflammatory lesions—vagina, urethra, bladder
  - Vaginal lymphoid hyperplasia

- Granulomatous urethritis (proliferative urethritis)
- Mucosal ulceration
- Glomerulations
- Inflammatory debris, sediment
- Identify bladder neoplasia (carcinoma, transitional cell, or squamous)
- Identify urethral neoplasia (carcinoma, transitional cell, or squamous)
- Identify bladder polyps
- Assess cases of suspected idiopathic feline lower urinary tract disease (rare in dogs)
- Document urethral obstruction
- Inappropriate micturition (“behavioral”)—rule out anatomic bladder and urethral disease
- Assess major abdominal trauma—evaluate integrity of the lower urinary tract

### Males

- Identify idiopathic urethritis (cats)
- Identify urethral obstruction—define cause
  - Urethral plug—feline
  - Urethral calculi (struvite, oxalate, urate)
  - Functional
  - Stricture
- After relief of urethral obstruction
  - Exclude urethral laceration, perforation, erosion
  - Determine extent of urethritis
    - After reverse flushing
    - After removal of urinary catheter
- Urinary incontinence—exclude structural/anatomic problems
- Major pelvic/abdominal trauma—evaluate integrity of urethra

A complete urethrocytoscopic examination should answer three questions: **1)** Were all anatomical landmarks—external urethral meatus, dorsal urethral crest, trigone, and two ureteral orifices—located? **2)** Were any abnormalities—such as calculi or heavy crystal burden in dependent locations, masses, diverticu-

lum that may be more readily assessed during bladder filling or drainage, stricture, ulceration, or lacerations—identified in the urethral or bladder lumen? **3)** Were any abnormalities of the mucosal detail (vascularity, tortuosity of vessels, erosions, ulcer, submucosal petechiations [glomerulations], edema, exaggerated

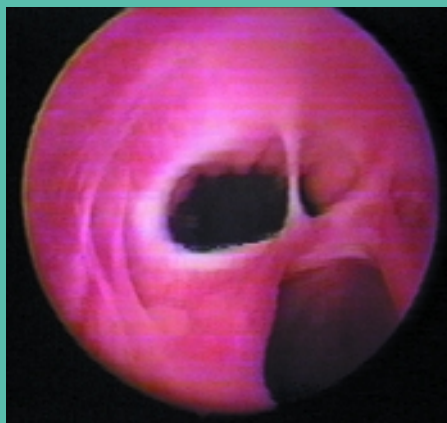
friability, lifting of the presumptive glycosaminoglycan/superficial epithelial layer) found?

Answers to these questions provide meaningful input for ruling in or ruling out various lower urinary tract disorders in small animal patients.

## Normal Findings



Normal appearance of the vestibule, urethral meatus, cingulum, and distal vagina after distention with sterile fluid through the cystoscope



A thin band of tissue spanning the cingulum from ventral to dorsal is sometimes found in normal female dogs.

# COMPLICATIONS

## Development of Complications

Complications during or after endourologic examination are rare and minor when uroendoscopy is performed by an experienced operator. Failure to gain entry into the urethra and bladder is a frustrating complication that can occur if the patient is small, the cystoscope is too large, or if lesions obstruct the urinary outflow tract. One size of cystoscope does not fit all sizes of dogs and cats. Lack of familiarity with the anatomical relationships of the vestibule, urethral meatus, vagina, and urethra will cause confusion on how to advance the cystoscope.

These anatomical relationships change when female dogs are sexually intact, in heat, or spayed. Inexperienced operators often misplace the cystoscope into the clitoral fossa of female dogs, which, when not distended, resembles mass lesions under magnification of the cystoscope. The appearance of the vagina

is surprisingly similar to that of the urethra, especially in spayed dogs after inadvertent entry into the vagina without observation of the urethral meatus. Intact female dogs often have a large flap of urethral tissue that covers the urethral opening, which occasionally makes it difficult to determine precisely where the urethra is, and this effect may be more pronounced in bitches in heat.

During active heat cycles, the cingulum can be quite large and the vagina very flaccid. Failure to create adequate chamber distention of the vestibule often makes accurate advancement of the cystoscope difficult. This occurs when infused fluids rapidly return out the vulva rather than distending the vestibule. Gentle but firm pinching of the ventral vulva around the shaft of the cystoscope is essential to retain adequate fluid volume to distend the vestibule. Operators with small fingers or weak hand muscles will have problems trapping enough fluid to distend the vestibule.

Failure to gain entry into the bladder after entering the urethra can occur when the scope shaft ascends the dilated anatomy of an ectopic ureter. It is not always clear which of several openings in the urethra continues to the bladder and which is associated with an ectopic ureter.

## Specific Complications Diagnostic Cystoscopy

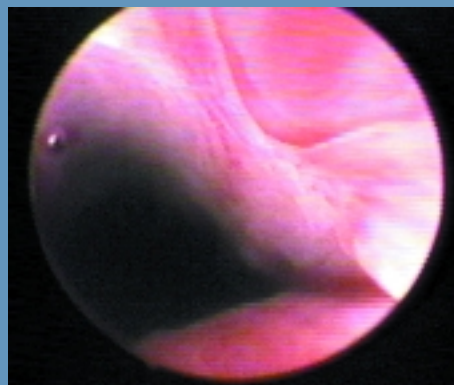
Perforation of the vagina, urethra, or bladder occurs infrequently during cystoscopy and typically occurs as a result of excessive force when the endoscope is passed or manipulated. Fluids should not be forced into the bladder under pressure unless it is carefully palpated to ensure that turgor is not excessive. Mild trauma of the mucosa of the urethra and bladder is inevitable due to scope manipulation and bladder distention. Hematuria may develop or worsen for a few days after lower urinary tract endoscopy but is usually self-limiting within a few hours. Acquired urinary tract

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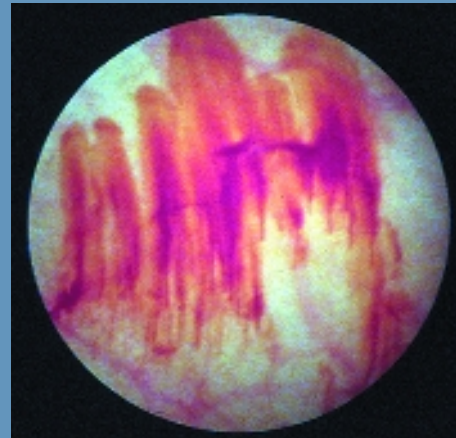


Broad bands that span the cingulum, or in this case from the dorsal part of the urethral meatus to the dorsal vestibule, are frequently associated with ectopic ureters.

## Abnormal Findings



Distal termination of the wide mouth opening of an ectopic ureter within the urethra. The dark space is the lumen of the bladder.



Artifact from the cystoscope traumatizing the bladder mucosa causing hemorrhage in a linear fashion

infection can occur after cystoscopy, but continuous sterile fluid irrigation during the procedure (and postprocedural antibacterial prophylaxis) may be protective. Perforation is usually caused by excessive force and operator inexperience. However, it is usually not serious if the rent is small and will seal 12 to 24 hours after placement of an indwelling Foley catheter to decompress the bladder and bypass the rent. Surgical repair is generally not necessary.

### Interventional Cystoscopy

Urine outflow could conceivably be obstructed after injections of submucosal collagen into the urethra for treatment of primary sphincter mechanism incompetence, but we have not encountered this possibility. Should it occur, passing a urethral catheter would probably compress the submucosal projections and allow adequate urine outflow. Some stran-

gia and a longer time to empty the bladder are expected in some dogs after successful placement of submucosal collagen.

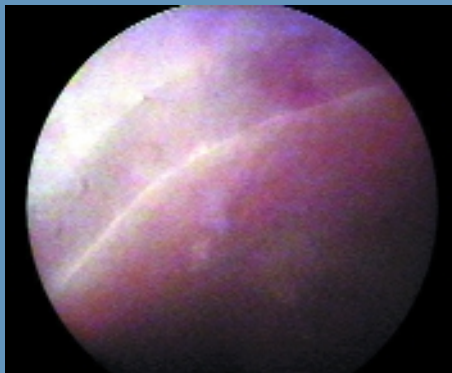
### Preventing Complications of Uroendoscopy

Gentle fluid distention of the vestibule allows guided passage of the cystoscope to minimize trauma. The tip of the cystoscope should be coated with sterile, water-soluble lubricant to allow easier passage of the scope. The largest scope that can pass should be chosen because it will give the best view. However, having at least two sizes of cystoscope on hand allows use of a smaller scope during unsuccessful attempts to pass a larger scope. Pulling the vulva caudally while firmly pinching the ventral vulva around the scope shaft creates a vestibular chamber during fluid infusion. Adequate vestibular distention maximizes the operator's chances of properly identifying the anatomy

and passing the scope with minimal trauma. If no fluid refluxes from the vulva during fluid infusion while the urethra or bladder is being examined, fit of the scope within the urethra may be tight. In such cases, it is essential to make sure that the bladder does not become overdistended—it is a good idea to drain the outflow from the cystoscope port periodically to decompress the bladder to prevent undue bladder trauma or rupture.

A 5-day course of prophylactic urinary antibacterial (usually amoxicillin) is prescribed after urethrocystoscopy in all patients. Antibiotics are prescribed on the premise that the patient may acquire a urinary tract infection, as completely sterile mechanical technique is nearly impossible despite operator skill and experience. ■

## Abnormal Findings



Artifact from the cystoscope, which has scraped off what appears to be the superficial glycosaminoglycan layer. This may occur in patients with bladder disease that increases mucosal friability.



Cystoscopic appearance of a ruptured bladder. The complication occurred during cystoscopic examination from manual compression of the fluid bag to increase the rate of infusion into the bladder when the bladder was already distended.