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OFFERING SOLUTIONS TO *Urinary* INCONTINENCE

Urinary incontinence is one of the main reasons dogs are relinquished or euthanized. This often-correctable condition is misdiagnosed and goes untreated but new treatment options can help solve the problem.

Proper diagnosis, treatment key to keeping
dogs as treasured family members



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He is a past-president of the European Society of Veterinary Nephrology and Urology and in 1991 was awarded the Fellowship of the Royal College of Veterinary Surgeons for meritorious contributions to learning in the field of veterinary urology.



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How do you properly
identify/diagnose urinary incontinence
in dogs?



A **HOLT:** The identification of urinary incontinence is fairly straightforward and is the reason given by owners for consulting the veterinarian ("my dog leaks urine in the house"). However, there are some things which need special attention.

The author's definition of urinary incontinence is the uncontrolled leakage of urine. This has to be differentiated from inappropriate micturition. This can be a behavioral problem, particularly in young, submissive bitches which may urinate when excited, for example when greeting their owners. This problem is often resolved as animals mature. A gray area is when the animal exhibits increased urinary urgency and frequency; for example the dog with cystitis, which may urinate in the house. Is this genuine incontinence or inappropriate micturition? In fact, it is probably both since the incontinence

in these cases is likely to be due to secondary detrusor instability (this can also occur as an idiopathic condition, unrelated to causes of bladder irritation such as infection, calculi or neoplasia). Animals that are polydipsic/polyuric (PD/PU) may urinate in the house but the investigation in such cases should concentrate on the reasons for the PD/PU rather than the urgency/frequency that may result.

Some owners may think their animal is incontinent because of severe vulvitis, exacerbated by self-trauma. This can be due to the effects of urine leakage. Genuine urinary incontinence has to be differentiated from the vulval and perivulval scalding with urine in continent animals, which may be associated with infantile vulva and perivulval skin folds. Careful questioning of the owner is required to determine that this scalding is not due to passive urine leakage. It is important to remember that

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urinary incontinence is a symptom, not a diagnosis.

GRAUER: Urinary incontinence can strain even the strongest human-animal bonds. In cases where the urinary incontinence cannot be controlled, euthanasia and pet relinquishment are all too common. The most common forms of urinary incontinence are caused by urethral sphincter mechanism incompetence (USMI) and urinary bladder hypercontractility. Less commonly, congenital anatomic abnormalities of the urogenital system and urine retention disorders can also be associated with urinary incontinence.

USMI occurs when intravesicular pressure exceeds urethral sphincter closure pressure. This syndrome is more common in females but can also occur in males. Historically, USMI is often most pronounced when the patient is lying down and relaxed or asleep. This sphincter incompetence can be associated with aging, abnormal bladder neck position, decreased urethral length, and abnormal vaginal conformation. Urethral sphincter incompetence may also be caused or aggravated by declining estrogen concentrations subsequent to ovariectomy as estrogen is thought to up regulate the alpha-receptors of the smooth muscle of the internal urethral sphincter. In males, incontinence associated with USMI may be more continuous and is apparently unrelated to castration. In rare cases, USMI may be associated with trauma and nerve damage (e.g., fractured pelvis or prostatic surgery). Dogs with USMI usually posture and void normally when the bladder is full. Decreased urethral sphincter tone

is a risk factor for bacterial ascension to the bladder and predisposes patients with USMI to urinary tract infections (UTI).

Urinary bladder hypercontractility results in inappropriate, involuntary detrusor contractions triggered at low bladder pressures or volumes. Causes of bladder hypercontractility include neuropathic disorders (detrusor hyperreflexia), inflammatory disorders (sensory hyperreflexia), and idiopathic disorders (detrusor instability). The involuntary detrusor contractions result in a sensation of urgency that can cause pollakiuria, incontinence, dysuria and stranguria.

Urinary incontinence in a young dog may be associated with a variety of congenital defects of the urinary and/or genital systems. Ectopic ureters and vaginal strictures or bands are the most common defects, but a patent urachus, urethrovaginal fistula, ureterocele, bladder and/or urethral hypoplasia, bladder exstrophy, and pseudohermaphroditism can also result in urinary incontinence.

Multiple congenital anatomic abnormalities are not unusual and coexisting functional USMI can result in a high rate of incontinence following surgical correction of the anatomic abnormality.

Urinary incontinence associated with urine retention disorders is termed paradoxical incontinence. Urine retention and bladder distention can occur secondary to either decreased detrusor contractility or increased urethral outflow resistance. In either case, urine leakage or bladder/urethral rupture occurs when intravesicular pressure exceeds outflow resistance. In chronic urine retention disorders in dogs, paradoxical incontinence is

more common than rupture of the bladder or urethra or the development of hydronephrosis.



What role does the pet's history play in diagnosis?

A **HOLT:** The pet's history is helpful in suggesting a possible diagnosis but is by no means pathognomonic. The following questions are helpful with the rationale.

What sex is the dog? Ureteral ectopia is more common in females; USMI is more common in neutered animals of both sexes; prostate disease.

How old is the dog? Congenital disorders more likely to be observed in young animals but not always – although unusual, dogs with ureteral ectopia, for example, may develop incontinence later in life. It is useful to be aware of the relative incidence of disorders resulting in urinary incontinence in different age groups. For example, ureteral ectopia is the most common cause of juvenile incontinence while acquired USMI is the most likely diagnosis in adult incontinent bitches.

What breed is the dog? There are breed predispositions for ureteral ectopia and urethral sphincter mechanism incompetence.

What is the nature of the incontinence? Differentiate inappropriate micturition from true incontinence; copious leakage more likely to be from the bladder (e.g. urethral sphincter mechanism incompetence) compared to the dripping incontinence of ureteral ectopia; incontinence present all the time more likely to be associated with ureteral ectopia or ureterovaginal fistula compared to

the often-intermittent leakage associated with urethral sphincter mechanism incompetence; leakage from the umbilicus pathognomonic for pervious urachus.

When does incontinence occur? Incontinence is usually worse during recumbency, for example, in cases of USMI but the same may be true for neurogenic or obstructive overflow incontinence.

Does the dog urinate normally? Neurogenic and obstructed animals usually do not; animals with hypoplastic bladders and other causes of detrusor instability may urinate more frequently than expected and exhibit nocturia.

Is the animal anorexic and/or lethargic? Most incontinent animals are otherwise well so a sick patient may indicate a systemic disorder such as renal failure leading to PD/PU, mimicking incontinence.

Does the animal drink excessively? Think of causes of PD/PU.

GRAUER: Obtaining an accurate history is an important part of diagnosis. The following are historical observations often associated with the various types of incontinence:

- **USMI:** Most common in females. Usually there is normal voiding posture and behavior. Urine leakage is usually most pronounced when the patient is asleep or relaxed.

- **Detrusor hypercontractility:** Breaking of normal house training behavior resulting in "accidents," pollakiuria, dysuria, stranguria. Hematuria may also be noted by the owner.

- **Ectopic ureter:** Young animal and urine leakage is often continuous and present since birth.

- **Vaginal strictures:** Urine leak-

age is often intermittent and may be associated with changes in body position.

• **Paradoxical incontinence:** Distended painful abdomen, pollakiuria, dysuria, stranguria with an absent or diminished urine stream.

Q What should be included in the diagnostic evaluation for urinary incontinence?

A **HOLT:** Diagnostic evaluation should include imaging, laboratory examinations and, if available, urodynamics. For many of the physiological causes of incontinence (e.g. urethral sphincter mechanism incompetence), the diagnostic aids are mainly used to eliminate other possible diagnoses such as physical causes of incontinence (e.g. ureteral ectopia, ureterovaginal fistula).

Imaging can include radiography and/or ultrasonography; in the author's experience, radiography yields more information in incontinent animals but ultrasonography is a useful adjunct in many cases. Contrast radiographic investigations should include intravenous urography and retrograde positive contrast vaginourethrography (females) or urethrography (males). If these latter techniques are followed by the introduction of air into the bladder, a double contrast cystogram is obtained which may be useful in eliminating suspected bladder lesions.

Catheterization is sometimes used as a diagnostic aid (e.g. suspected obstructed animals with retention and overflow incontinence) but is unreliable. A tortuous groove in the os penis can resemble a urolith during catheterization while soft tissue obstructions may be displaced by the

catheter without the veterinarian appreciating their presence. Although cystocentesis is the preferred method of obtaining urine samples for bacteriology, the urinary bladder of incontinent animals may be small and/or intrapelvic making palpation and centesis difficult. In these cases, the author relies on catheterized urine samples but low bacterial counts in such samples should be ignored. Urine should be submitted for bacteriological, biochemical and/or cytological examinations, depending on what the suspected diagnosis is.

Advanced diagnostic testing involves urodynamics. In incontinent animals, these mainly include urethral pressure profilometry, cystometry and electromyography.

GRAUER: Physical examination of the patient with urinary incontinence should include digital rectal and vaginal palpation, neurologic assessment and observation of voiding. Digital rectal palpation should be used to assess anal tone, the prostate gland in males, the pelvic and prostatic urethra, the pelvic canal, and, in smaller dogs, the trigone region of the bladder. Digital vaginal palpation should be used to assess vaginal confirmation and to rule out vaginal strictures, bands and masses. The neurologic examination should be used to assess the perineal sensation and the bulbospongiosus reflex (sensory and motor function of the pudendal nerve) and to rule out lumbosacral abnormalities and pain. Observation of voiding allows assessment of voiding posture and the urine stream. The urinary bladder should be palpated before and after voiding to assess bladder size and

urine residual volume and to rule out abnormalities like cystouroliths and masses.

Most cases of urinary incontinence are associated with a small or normal-sized bladder, the exception would be a urine retention disorder that results in a distended bladder with paradoxical urinary incontinence.

In patients with detrusor hypercontractility, the bladder wall may be thickened and/or painful and occasionally, cystouroliths and/or bladder masses (e.g., polyps, tumors) may be palpated. Patients with urinary incontinence may have a moist or wet perivulvar/peripreputal area associated with urine leakage and/or perivulvar/peripreputal dermatitis. A "tucked in" vulva or excessive perivulvar skin folds may predispose the patient to bacterial UTI and incontinence associated with detrusor hypercontractility.

In many cases of urinary incontinence, the patient's CBC, serum biochemistry profile, and urinalysis will be normal/unremarkable. Inflammation of the lower urinary tract causing detrusor hypercontractility will often result in increased numbers of RBCs, WBCs, and uroepithelial cells in the urine sediment. In cases of a primary or a complicating UTI, alkaline urine with an active sediment (hematuria, pyuria, epithelial cells, struvite crystalluria, and/or bacteriuria) and positive culture may be present. Crystalluria may also be present in patients with cystouroliths.

In cases of urethral incompetence, urethral pressure profilometry will usually demonstrate decreased urethral closure pressure and/or a decreased functional profile length. Vaginoscopy and/or intravenous urography

may be used to diagnose ectopic ureters and vaginoscopy or positive contrast vaginography may be used to diagnose vaginal strictures and/or bands.



Q What are the treatment options and prognosis for dogs suffering from urinary incontinence?

A **HOLT:** The treatment of urinary incontinence depends on the cause; hence the need for a rigorous diagnostic evaluation. Some conditions (e.g. ureteral ectopia, ureterovaginal fistula) require surgical therapy.

The most common condition, USMI, is a multifactorial problem. Thus its treatment may be difficult and most therapies correct only one of the factors. It is unlikely, therefore, that any one form of treatment alone will cure 100 per-

Educational Material

Vetoquinol USA, Inc., has educational material on canine urinary incontinence that can help you effectively discuss this condition with your clients. Call 800 267 5707, to receive the following free material:

- Wall charts "Urinary incontinence can test even the strongest pet owner bond."
- Wall charts (anatomical) on "Understanding urinary incontinence."
- Attractive client brochures and brochure holders on urinary incontinence.
- Illustrated instructions for you to give clients using Propalin™ for their pets.
- Starter kits which contains all of the above and more.

cent of cases in the long term.

In theory, sympathomimetic or parasympatholytic agents should improve continence control by increasing urethral tone or reducing intravesical pressure respectively but the results of clinical trials are variable with follow-up periods often short and possible long-term adverse systemic effects have not been evaluated. Currently, the two veterinary treatments used for the control of incontinence in dogs in the United Kingdom and the United States are alpha-adrenergic phenylpropanolamine, i.e. Propalin™, Vétroquinol, and estrogens. Phenylpropanolamine can be used in neutered and entire bitches and in the author's experience, is effective in many cases, improves the situation in other animals and fails to control the incontinence in some instances. In a recent study, Propalin was effective in 85.7 percent of treated bitches but the follow-up period on these was short (28 days). Affected spayed bitches may also respond to estrogen therapy but in some animals the response ceases eventually, despite increasing the dosage of estrogens, possibly due to desensitization of estrogen receptors. Some animals show no response. Estrogens sensitize the urethral smooth muscle to alpha-adrenergic stimulation and so a combination of estrogen and alpha-adrenergic therapy may be useful in non-responsive cases and reducing the dose of each individual drug, reducing the chances of side effects. Androgens have been employed in castrated male dogs but, in the author's experience, the results are disappointing.

USMI incompetence in male

dogs is uncommon. As in the bitch, the condition can occur as either a congenital or acquired condition. The congenital condition is often associated with gross prostatic/pelvic urethral deformity and is unlikely to be successfully treated. As in the bitch, the acquired form often follows neutering and larger breeds appear to be at risk. Incontinence is likely to occur when intra-abdominal pressure increased (e.g. during recumbency) and affected animals tend to have intrapelvic bladder necks, although a short urethra does not appear to be a factor in males. Conservative management is frequently disappointing.

GRAUER: The following therapies offer options for urinary incontinence.

1. Alpha adrenergic agents:

- Phenylpropanolamine (e.g. Propalin), 1.5–2.0 mg/kg, PO bid-tid.

2. Hormone replacement therapy:

- Diethylstilbestrol (DES), 0.1–1.0 mg, PO, sid for five days, then 0.1–1.0 mg, PO, every five days.
- Testosterone cypionate (Andro-Cyp), 2.2 mg/kg, IM, every 30–45 days.

3. Surgical treatments may be an option if the previously mentioned veterinary therapy is ineffective.

Detrusor hypercontractility associated with lower urinary tract inflammation:

1. Treat the underlying cause (e.g., appropriate antibiotic treatment for the UTI).
2. Anticholinergic/antispasmodic drugs are used for idio-

pathic detrusor hypercontractility (these treatments are continued until clinical signs resolve):

- Propantheline (Pro-Banthine®), 0.25–0.5 mg/kg, PO, bid to tid.
- Oxybutynin (Ditropan®), 5.0 mg/dog, PO, bid to tid.
- Dicyclomine (Bentyl®, Bentylol®), 10 mg/dog, PO, tid to qid.
- Imipramine (Tofranil®), 5–15 mg/dog, PO, bid.

Congenital disorders of the urogenital system often require surgical correction. It's important to keep in mind that USMI may be a complicating factor.

Paradoxical incontinence: Primary treatment is aimed at increasing detrusor contractility or decreasing outflow resistance.



How can veterinarians and their staff properly discuss urinary incontinence with pet owners?

A **HOLT:** Veterinarians and their staff need to be empathetic when dealing with the owners of incontinent animals. They need to be aware that this is more often a social problem for the owners than a clinical problem for the pet, although most animals are aware that they are leaking urine, that they are not supposed to urinate in the house and thus feel they are misbehaving. This may sound a little anthropomorphic but the author is frequently informed by owners after successful treatment for urinary incontinence that the animal "has taken on a new lease on life," "is much happier and more confident," etc. Statements like these suggest (with the benefit of hindsight) that the condition was affecting the animal psychologi-

cally more than the veterinarian and the owner realized.)

Incontinence is a real problem for owners to cope with and manage. The possible causes of incontinence need to be discussed with owners and the need for a thorough investigation emphasized. An anatomical chart is a must for these conversations to point out what might be wrong with the dog and result in incontinence. A good example is the exam room wall chart provided by Vétroquinol. As this chart is intended to be fixed to the exam room wall, it is useful to relate it to the contrast radiographs resulting from the investigations and improved the owner's understanding of the condition and its treatment. Once the diagnosis is established, the owner then needs to be taken through the various options for treatment and advised on which is likely to be most appropriate for their animal. They also need to be informed of the prognosis involved and any potential complications so they can make an informed decision as to which method of management they would feel most comfortable following.

GRAUER: Many forms of urinary incontinence are treatable. Effective treatment not only improves the human-animal bond but also improves the urinary tract health of the patient. An accurate diagnosis is an important aspect of effective treatment. With proper interpretation of history, physical examination and urinalysis findings, and in some cases urinary tract imaging, an accurate diagnosis can often be made.

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