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URINARY INCONTINENCE IN JUVENILE ANIMALS

INTRODUCTION
A variety of conditions can lead to urinary incontinence in juvenile animals and investigative procedures are aimed at differentiating between them. Such procedures are not detailed in these notes but should include imaging (intravenous urography, retrograde positive contrast vaginourethrogram or urethrogram, ultrasonography) and laboratory investigations such as urine bacteriology and, if indicated, haematology and serum biochemistry. It is important to differentiate inappropriate micturition in juvenile animals from genuine urinary incontinence. A summary of the causes of urinary incontinence in juvenile animals is given below.

ECTOPIC URETER
Although rare, this is the commonest cause of urinary incontinence in juvenile dogs. This is mainly a problem of dogs but has also been reported in cats, horses and cattle. The cause is unknown but hereditary factors and vitamin imbalance in the dam may play a role. Incontinence may be continuous or intermittent and even in bilateral cases, normal micturition usually occurs. Diagnosis is by contrast radiography when a ureterocele may be detected. If such ureteroceles become large enough, they can obstruct the bladder neck leading to dysuria/stranguria. Secondary complications are common and usually involve the kidney and ureter on the affected side (e.g. hydronephrosis, hydroureter, pyelonephritis).

Most ectopic ureters terminate in the urethra or, sometimes, the vagina and there is no relationship between the side of ectopia and the site of termination of the ureter. Ectopic ureter is commoner in female than male animals. There is a breed predisposition in the UK (Labradors, Golden Retrievers and Skye terriers) whilst in the USA Siberian Huskies, Newfoundlands, Bulldogs, West Highland White terriers, fox terriers and miniature and toy poodles appear to be at risk.

Treatment involves transplanting the ureter into the bladder or excision of the ureter and associated kidney if severe secondary disease is present. Transplantation techniques nowadays usually involve intravesical stomatisation of the intramural ectopic ureter (which most are) followed by occlusion or excision of the ureteral distal to the stoma. In the rare case of an ectopic ureter which is not intramural and which by-passes the bladder completely (this is more common in cats than dogs), ureteroneocystostomy is the transplantation technique used. Irrespective of the method of treatment, in the author's hands, only approximately 50% of animals are completely cured although in most of the remainder, the incontinence is markedly reduced. Some animals show no improvement after surgery, possibly due to undiagnosed bilateral ectopia, concomitant sphincter mechanism incompetence, bladder hypoplasia or anomalous ureteric branches. In some instances, the reason for failure of response cannot be determined.

CONGENITAL URETHRAL SPHINCTER MECHANISM INCOMPETENCE
Congenital urethral sphincter mechanism incompetence tends to be a problem of large breeds of dog, predominantly bitches. Leakage of urine is more copious compared to animals with ureteral ectopia and occurs predominantly when the dogs are recumbent. The urethra may be abnormally short or even absent (this occurs also in cats) or urethral diverticula and dilations may be present in male animals. In many bitches, no gross abnormalities are detected on contrast radiographic investigations, apart from a caudally positioned bladder and the diagnosis frequently relies on the history and elimination of other possible causes of incontinence. Urodynamic investigations are of some value but are not always diagnostic. Approximately half of affected bitches become continent following their first oestrus and should thus not be spayed earlier! Oestrogens are contra-indicated in juvenile bitches with this condition because of possible adverse 'feed-back' effects on the pituitary but alpha-adrenergics such as phenypropanolamine could be used, pending oestrus. Similarly, a few male dogs improve after puberty. Those animals that do not may be candidates for medical or surgical management.

In bitches, management with alpha-adrenergics may be continued or colposuspension may be performed. In female animals with severe urethral hypoplasia, bladder neck reconstruction may be beneficial. The prognosis in affected male dogs is guarded to poor, depending on the severity of the anatomical abnormalities. The author's impression is that urethral sphincter mechanism (congenital or acquired) in male dogs is more difficult to manage than in bitches.

BLADDER HYPOPLASIA
This is a subjective diagnosis and it is unclear if the problem is true bladder hypoplasia or failure of normal bladder growth and development. It is not uncommonly associated with other congenital causes of incontinence but may, rarely, occur alone. The diagnosis is confirmed by contrast radiography and only a small amount of contrast medium is required to fill the bladder during retrograde techniques. Great care should be taken, therefore, in juvenile animals not to introduce too much contrast medium during retrograde contrast radiographic techniques. It is important in these animals to eliminate other causes of incontinence which may also be present since the small bladder may be a reflection of poor bladder development because of lack of stimulation by adequate intravesical volumes of urine (e.g. the dog with ectopic ureter in which much of the urine bypasses the bladder and so is not stored).

Treatment of this condition is also unsatisfactory although anticholinergic drugs may help to relax the bladder and allow an increase in filling before the urge to urinate occurs. In some animals, following treatment of a concomitant cause of incontinence (e.g. ectopic ureter), the bladder will develop to a normal size.

PERVIOUS URACHUS
This condition is easily diagnosed since incontinence occurs through the umbilicus which may be scaled with urine. Contrast cystography confirms the diagnosis. Treatment involves excision of the urachus and repair of the resulting cranial bladder wall defect.
INTERSEXUALITY
Rarely, intersex animals may be incontinent. This is usually associated with the anatomical abnormalities illustrated by Holt and others. It is likely that urine accumulates in the vagina during micturitions and subsequently leaks out via the urethra. Diagnosis relies on contrast radiography such as retrograde positive contrast urethrocystography.

Treatment involves excision of the vagina, uterus and gonads via a laparotomy, taking care to preserve the blood and nerve supply to the bladder.

CONGENITAL NEUROLOGICAL CONDITIONS (EG SPINA BIFIDA, HEMIVERTEBRAE)
Affected animals usually present as obvious neurological cases (eg. paraparetic) but faecal and urinary incontinence may be present. Upper motor neurone lesions result in spasticity of the external urethral sphincter muscle. Increased urethral resistance leads to urinary retention with overflow incontinence.

Lower motor neurone lesions result in interruption of the sacral reflex arc. Thus, reflex bladder contraction and urethral relaxation do not occur and urine is retained in the bladder with overflow incontinence. Spinal radiography/MRI scanning may confirm the diagnosis and euthanasia of the animal is indicated if the symptoms persist although some dedicated owners manage to cope with these animals.

REFERENCES AND FURTHER READING