Proceedings of the
8th International Symposium
on Canine and Feline Reproduction
ISCFR

June 22-25, 2016
Paris, France

In a joint meeting with the XIX EVSSAR Congress

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Ureterovaginal fistula in a 6 year old mixed-breed dog after ovariohysterectomy  
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A 6 year old spayed mixed breed dog was referred to our hospital because of urinary incontinence (UI). The owner reported that UI occurred within one week of ovariohysterectomy, which was performed four years ago during a caesarean section. The dog had a normal micturition pattern but tended to dribble when she is active, excited or when lying down. Previous medical therapies with ephedrin and estriol were ineffective. The physical examination indicated no abnormalities, only a mild thrombocytosis, minor electrolyte imbalances (Ca↑, P↓, K↓) and a slight proteinuria was found. The urine culture was negative. In the abdominal ultrasound both ureter openings could be visualized in the trigonum of the urinary bladder. The urinary bladder wall and the urethra were normal. The left kidney was much smaller than the right (renal length 2.7cm versus 5.5cm, respectively) and showed irregular shape and loss of cortico-medullary definition. Vaginoscopy depicted at the cranial ending of the vagina a small orifice leaking a urine-like fluid. A tentative diagnosis of an ureterovaginal fistula (UF) was confirmed by vaginography: Contrast medium drained from the vagina directly into the left ureter which extended from the renal pelvis to the apex of the vagina, and finally turned cranioventral in the trigone of the urinary bladder. To restore continence ureteroneocystostomy with resection of the UF-tract, including the distal part of the ureter, was performed to ensure drainage of the urine from the left ureter into the bladder. The dog recovered well from surgery and was continent, but showed hematuria and pollakiuria for several days. Post-operative treatment consisted of amoxicillin clavulanic acid (20mg/kg BID PO), robenacoxib (1mg/kg SID PO), flavoxate (10mg/kg BID PO), and omeprazole (1mg/kg SID PO). The day after surgery ultrasonography showed a severe dilation of the left ureter (up to 9.3mm in diameter) and a hydronephrosis which were assumed to be a sequelae of postoperative swelling. A repeated urine culture was negative. One week post-operative the dog was discharged. The last ultrasonographic examination three weeks later showed a marked decline of the previous dilation of the renal pelvis and the left ureter (up to 2.1 mm in diameter), but the ureteroneocystostomy site remained mildly dilated. Whereas in human medicine UF is a commonly reported complication of emergency hysterectomy, only nine cases are reported in dogs. All of them were presented due to UI within two weeks of surgery. In most of the dogs diagnosis was made by intravenous urography, in some of them further diagnostics procedures such as vaginography or a vaginoscopy were needed. In one dog an anterograde ureterography with nephropyelocentesis [1] and in another an exploratory laparotomy led to a diagnose. After a ureteroneocystostomy (7 dogs) or nephrectomy (2 dogs) all the patients became continent within a few days [2]. Because the surgeries were performed weeks to years after ovariohysterectomy it was not possible to determine whether the ureter was included in the ligature of the vaginal stump or if an inflammatory reaction of the stump led to the UF. The history of first occurrence of UI shortly after ovariohysterectomy is highly suspicious for an UF. Even if there are no changes on ultrasonography such as distended ureter or hydronephrosis, a further diagnostic work-up should be performed to exclude an ureterovaginal fistula.