

# Urethral Leiomyosarcoma in a Bitch

**Cartagena Albertus, J.C.,<sup>1,3,4\*</sup> Moya García, S.,<sup>1</sup> Moise, A.,<sup>2</sup> Fontalba Navas, J.L.,<sup>1</sup> Engel Manchado, J.,<sup>1</sup> Stonton, S.<sup>4</sup> and Montoya Alonso, J.A.<sup>3</sup>**

<sup>1</sup>Hospital Animal Bluecare, Mijas, España.

<sup>2</sup>Sheriff Highway, Newcastle, UK.

<sup>3</sup>Internal Medicine, Faculty of Veterinary Medicine, University Institute for Biomedical and Health Research (IUIBS), Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.

<sup>4</sup>Broadway Veterinary Hospital, Peterborough, UK.

\* **Correspondencia:** Dr. Juan Carlos Cartagena Albertus, DVM, MRCVS, Msc, Broadway Veterinary Hospital, 158 Broadway Peterborough PE1 4DG Cambridgeshire, UK. Email: jcarloscartagena@yahoo.es FAX: +44-1733557169

## ABSTRACT

This report described a French Bulldog bitch with clinical signs of dysuria, vaginal bleeding and presence of a vaginal mass. An episiotomy was performed and the mass was excised with a diagnosis of urethral leiomyosarcoma. To best of authors' knowledge, a urethral leiomyosarcoma has been not reported in the veterinary literature.

**Keywords:** Dog; Urethra; Vagina; Leiomyosarcoma.

## CASE REPORT

A 9-year-old female French Bulldog was presented with signs of dysuria and vaginal bleeding. Microchipped, 8.3 kg in weight, vaccinated and treatments for parasites were up to date. The dog continually exhibited a red copious vulvar discharge; a narrow vagina made it impossible to perform a proper digital exploration. A palpable mass was detected under the skin between the anus and the vulva. Digital rectal examination was sufficient to determine the extent of local lesion.

Thoracic radiography and abdominal ultrasonography ruled out local spread of the tumor or distant metastasis. An ultrasound-guided cystocentesis was carried out. Even though the dog presented signs of dysuria, the results of the urine analysis showed no evidence of inflammation or infection. Ultrasonography showed the mass to be located in the vagina, between the pelvis and perineum where it measured 6 cm x 4 cm x 4 cm.

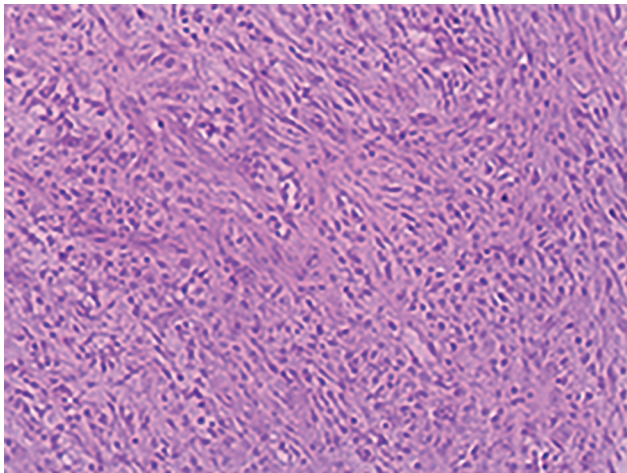
Preanesthetic blood tests (standard biochemistry with electrolytes) were all within normal limits. The premedication

was acepromazine (Elanco Europe Ltd, Basingstoke, UK, 0.005 mg/kg IM), atropine (Atrocare, Animalcare Ltd., York, UK, 0.02mg/kg SC), buprenorphine (Buprecare, Animalcare Ltd., York, UK, 0.01mg/kg, IM 45 minutes before the induction) and metoclopramide (Emeprid, Ceva, Animal Head Ltd., Amerham, UK, 4 mg/kg IV and constant rate infusion 1 mg/kg/ day). The patient was preoxygenated for 10 minutes followed by induction with propofol (Propoflo Plus, Zoetis, London, UK, 3 mg/kg IV) and maintenance with isoflurane (Isoflo, Zoetis, London, UK) in pure oxygen. Fluid therapy comprised compound sodium lactate (Aquaphoarm 11, Animalcare Ltd, York, UK, 10mg/kg/hr IV). The analgesia was carried out using buprenorphine and meloxicam (Metacam, Boehringer Ingelheim, Ingelheim/Rhein, Germany, using an initial dose of 0.2 mg/kg SC q24h followed for 0.1 mg/kg PO q24h for a week).

The patient was placed in sternal recumbency with the hindquarters elevated and the pelvic limbs extended caudally over the edge of the table. A purse string suture was placed in the anus to avoid contamination of the surgical area. Urinary

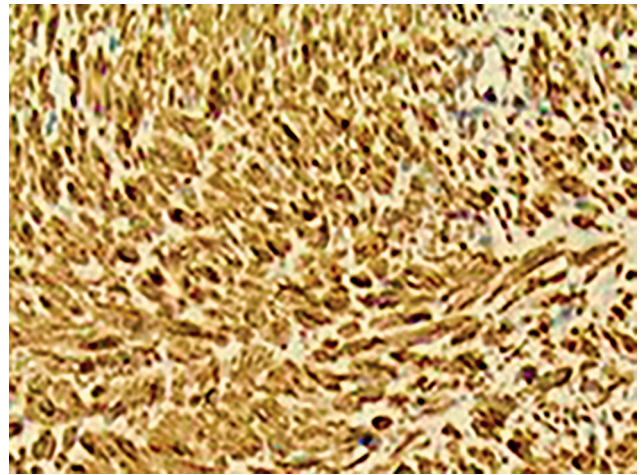


**Figure 1.** Midline episiotomy in a French Bulldog female dog showing a portion of a urethral leiomyosarcoma



**Figure 2.** Histopathology of a urethral leiomyosarcoma (H&E x200). This tumor is a malignant neoplasm exhibiting smooth muscle differentiation. Courtesy of histolab Veterinaria.

catheterization was attempted before the episiotomy but unsuccessful. A dorsal midline episiotomy was performed (Figure 1). The tumor was located at the dorsal aspect of the urethra, adjacent to the urinary meatus. The circumferential incision with CO<sub>2</sub> laser (15w) involved part of the urethral orifice, so that the mucosa was reattached to an adjacent dorsal area of the vaginal mucosa with simple interrupted sutures of polyglactin 5-0 (Vicryl, Ethicon, Somerville, US). A sterile urinary catheter was inserted and retained for 2 days. The episiotomy was closed with a three-layer repair with 3/0 polydioxanone suture (PDS II, Ethicon, Somerville, US). The recovery was satisfactory after the operation and urination was almost normal following removal of the urinary



**Figure 3.** Immunohistochemistry of a urethral leiomyosarcoma (x200), positive for vimentin, desmin and smooth muscle actin. (Courtesy of Thompson Path)

catheter with night episodes of incontinence for 6 weeks after the surgery.

The histopathological diagnosis was a urethral leiomyosarcoma with poor prognosis due the high rate of local recurrence. The cells formed long intersecting fascicles and frequently displayed an infiltrative growth into the surrounding urethral mucosa. A moderate degree of atypia and rapid mitotic activity with tumor cell necrosis were identified (Figure 2). The samples were composed of elongated cells with eosinophilic fibrillary cytoplasm and elongated blunt-ended nuclei. Furthermore, immunohistochemically, this tumor labeled positive for vimentin, desmin and alpha smooth muscle actin, thus confirming the diagnosis of a urethral leiomyosarcoma (Figure 3).

Digital vaginal and rectal examinations were performed monthly to monitor for tumor recurrence. Thoracic radiographs and abdominal ultrasound are performed every 3 months.

## DISCUSSION

Primary tumors of the vulva and vagina account for 2-3% of neoplasms in dogs and are usually benign (71-82%). The malignant tumors of the vulva and vagina are leiomyosarcoma, transmissible venereal tumor (TVT) and squamous cell carcinomas (1).

Leiomyosarcomas are slow-growing malignant tumors of smooth muscle origin, which account for 10% of all smooth muscle tumors. The leiomyomas can undergo malignant

transformation. Leiomyosarcomas represent only a small proportion of urinary system tumors (2).

Leiomyosarcomas are highly invasive tumors. They tend to invade surrounding tissues but metastasis is rarely reported. Leiomyosarcomas are not hormone-dependent in the dog (2, 3). Canine vaginal leiomyomas and leiomyosarcomas occur in older bitches and are rarely associated with clinical signs and many are incidental findings at the time of necropsy or ovariohysterectomy (4). Dogs with vaginal and vulvar neoplasia may have constipation, vulvar swelling, vaginal bleeding, stranguria, perineal swelling, haematuria, tenesmus, a visible vulvar mass, and excessive licking of the vulva (1). Many of the benign tumors are pedunculated, grow within the confines of the vagina and only at a later stage protrude through the vulval lips. Urinary incontinence does not usually occur (4, 5).

Most malignant tumors of the vagina and vulva are non-pedunculated. Surgery has been described as a treatment for malignant tumors, but recurrence is common and, in some cases, malignant tumors have been deemed inoperable and the animal subsequently euthanized (2,5). The clinical signs of vaginal malignant neoplasia depend upon the tumor size, presence of metastasis and any concurrent illness (6-8).

Urethral tumors are rare in dogs and include transitional cell carcinoma and fibrosarcoma (9). To the best of our knowledge, a urethral leiomyosarcoma has been not reported in the veterinary literature.

The prognosis following resection of malignant vaginal disease is favorable and survival times exceeds one year (10). In our patient, 14 months have passed since the surgery without signs of recurrence.

Urethral tract obstruction corresponds to obstruction to urine outflow and has major local and systemic consequences. The urethral obstruction is an acute disease due to a structural cause. The renal effects of the obstruction occurs due to the changes in renal blood flow, glomerular filtration rate, tubular function and the process of interstitial fibrosis (11). In addition to the renal effects, local pressure damages the urethral mucosa. Bladder function may also become compromised due to reduced blood flow, hypoxia and damage within the wall (11). In our case, the dog showed problems controlling micturition for 6 weeks after the surgery performed. No evidence of kidney disorders were detected, probably because the tumor was only partially blocking the urethra.

Urinary tumors are common in older overweight female dogs (4). Urethral involvement can lead to complete outflow

obstruction. Cytology and biopsy can be performed, but care must be taken to avoid seeding the abdomen (4).

Urethral leiomyosarcomas can occasionally extend into the vagina and vestibule (12) and should be considered in the differential diagnosis for vaginal or vulvar tumors with an important impact in the treatment and prognosis. Most tumors in the urethra are non-resectable and therefore often, the main surgery goal is to maintain urine flow (13). There are a few specific principles of urinary tract surgery to consider such as the type of suture material used, use of suitable surgical instrumentation, risk of contamination (antimicrobials, cultures, etc.) and knowledge of the anatomy at that site. (14).

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