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Pathomorphological study on vaginal fibroma in a dog: A case report

Branimir Nikolov

Medical University, 1 Saint Kliment Ohridski Str., 5800 Pleven, Bulgaria

Corresponding author: br_nikolov@abv.bg

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Abstract: A twelve-year-old female Cocker Spaniel was presented for a clinical examination at a private veterinary clinic with an abnormal mass protruding from the external genitalia. According to the medical history, the pathologically altered tissue had shown accelerated growth, and in the last few days, the animal had begun to exhibit difficulty urinating. During vaginal examination, a well-defined, round mass with a firm-elastic consistency was found. Preoperative paraclinical examinations, including hematological and biochemical blood parameters, radiography, and ultrasonography, were performed. Surgical removal of the mass, along with ovariohysterectomy, was performed. The animal had a trouble-free recovery in the postoperative period. At a follow-up examination conducted a few months later, no recurrences of the tumor or metastases were found. Based on histopathological and immunohistochemical examination, a diagnosis of vaginal fibroma was confirmed.

Keywords: canine; vaginal prolapse; histopathology; vaginal fibroma; immunohistochemistry

INTRODUCTION

Vaginal neoplasia is relatively common in bitches (Igna et al., 2016). It is crucial to define vaginal tumors as benign or malignant correctly. Their adequate differentiation from other pathological conditions, such as hyperplasia, granulation tissue, and abscesses, can significantly affect the treatment approach and prognosis (Kang & Holmberg, 1983). The incidence of vaginal tumors in bitches is estimated to be 41%, and vulvar tumors account for 34.2% (Johnston et al., 2001). Vaginal tumors are usually benign (Tivers and Baines, 2010). Approximately 70-80% of benign vaginal and vulvar neoplasms are classified as leiomyomas, papillomas, fibromas, fibroleiomyomas, lipomas, myxomas, and myxofibromas (England, 1999; Aksu et al., 2024). Leiomyomas, lipomas, and fibromas are common in bitches (Thacher and Bradley, 1983). Benign vaginal neoplasia can be found growing on narrow or broad bases, as well as hanging stalks. They typically exhibit a limited and concentric growth pattern, directed towards the vaginal vestibular area or the cervix (Salomon et al., 2004). Most benign

tumors are treated by local resection, combined with ovariohysterectomy to prevent subsequent recurrence (MacLachlan and Kennedy, 2002; Igna et al., 2016). Leiomyosarcomas, carcinomas, and transmissible venereal tumors are the most commonly reported malignant neoplasms of the vagina, and, unlike benign tumors, they tend to grow rapidly and infiltratively (Hill et al., 2000; Tivers and Baines, 2010). In this case report, the clinical examination, diagnostic methods, and management of a vaginal **fibroma** found in an unspayed bitch are discussed.

CASE PRESENTATION

Study animal

The subject of this study was a 12-year-old unspayed female Cocker Spaniel, weighing 15 kg.

Case History

The animal was brought in for a clinical examination due to the presence of an abnormal mass protruding from the external genitalia. According to the medical history, the mass was

noticed by the owner approximately three weeks ago. Over the past two days, the female dog had exhibited restless behavior and frequent urges to urinate.

Clinical examination

The animal was in normal physical condition and had an internal body temperature of 38.6°C. No abnormalities were noted in terms of visible mucous membranes, appetite, respiratory activity and frequency, heart rate, and pulse values. Upon vaginal examination, a round, circumscribed mass with a firm-elastic consistency was found, originating from the right lateral vaginal wall. Moderate capillary bleeding from the prolapsed abnormal mass was also noted, probably caused by excessive licking.

Complete blood count (CBC) and serum biochemistry

Hematological parameters (white blood cells-WBC, 10⁹/L; lymphocytes-LYM, 10⁹/L; monocytes-MON, 10⁹/L; granulocytes-GRA, 10⁹/L; erythrocytes-RBC, 10¹²/L; hemoglobin-HGB, g/L; hematocrit-HCT, %; mean corpuscular volume-MCV, fL; mean corpuscular hemoglobin content-MCH, pg; mean corpuscular hemoglobin concentration-MCHC, g/L; red blood cell dis-

tribution width-RDW, %; platelets-PLT, 10⁹/L; mean dogplatelet volume-MPV, fL; platelet distribution width-PDW; eosinophils-EOZ, %), were analyzed in whole venous blood with a veterinary automatic analyzer Mindray BC-2800 VET (Mindray, China). Biochemical parameters (total protein-TP, g/L; albumin-ALB, g/L; globulin-GLOB, g/L; total bilirubin-TB, umol/L; alanine aminotransferase-ALAT, U/I; aspartate aminotransferase-ASAT, U/I; amylase-AMY, U/I; creatine kinase-CK, U/I; creatinine-CREA, umol/L; urea-BUN, mmol/L; glucose-GLU, mmol/L; triglycerides-TG, mmol/L; calcium-Ca, mmol/L; phosphorus-P, mmol/L) were analyzed in blood serum using a veterinary automatic analyzer Seamaty SMT-120 (Seamaty, China).

The results of the Hemogram test revealed marked leukocytosis, erythrocytopenia, and thrombocytopenia, whereas the biochemical parameters remained within normal reference ranges (Table 1).

Ultrasound Examination

The ultrasound examination was performed using a veterinary ultrasound machine DP-10 VET (Mindray, China). No pathological changes were detected in the uterus, ovaries, or other abdominal organs.

Table 1. Results of complete blood count and selected biochemical parameters

Indicator	Result	Reference Values	Indicator	Result	Reference Values
WBC	37.7	6.0-17.0	TP	64.4	49.0-82.0
LYM	3.4	0.8-5.1	ALB	22.5	23.0-40.0
MON	0.9	0.0-1.8	GLOB	42.0	19.0-45.0
GRA	33.4	4.0-12.6	TB	2.6	0.0-15.0
RBC	4.56	5.50-8.50	ALAT	64	5-125
HGB	92	110-190	ASAT	32	0-50
HCT	29.1	39.0-56.0	AMY	665	400-1500
MCV	64.0	62.0-72.0	CK	77	10-200
MCH	20.1	20.0-25.0	CREA	57.6	28.0-159.0
MCHC	316	300-380	BUN	3.80	2.50-9.60
PLT	107	117-460	GLU	5.73	4.11-7.94
MPV	10.2	7.0-12.9	TG	1.34	0.00-1.13
PDW	16.9	-	Ca	2.08	1.98-3.00
EOZ	3.4	-	P	1.90	0.81-2.19

Thoracic Radiographs

The chest radiography was conducted in lateral, dorsal, ventro-dorsal, and dorsocaudal projections, using a veterinary X-ray system (Vet System 30 Plus, BMI, Italy). The examination excluded the presence of pulmonary metastases.

Anesthesia

Atropine sulfate was used for premedication, at a dose of 0.02 mg/kg subcutaneously, 20 minutes before induction of anesthesia. Induction was performed by intravenous administration of Dexdomitor® (dexmedetomidine hydrochloride 0.5 mg/ml, Orion Pharma, Finland), at 0.015 mg/kg and Butomidor® (butorphanol 10mg/ml, VetViva Richter, Austria) at 0.1 mg/kg. General anesthesia was achieved and maintained by intravenous administration of Zoletil® (25 mg/ml tiletamine and 25 mg/ml zolazepam, Virbac, France) at a dose of 10 mg/kg. During the intervention, the animal was under constant monitoring and intravenous fluid therapy with isotonic saline (Natrium Chlorid Braun 0.9%) at a dose of 20 ml/kg over 45 minutes. Recovery from anesthesia was achieved by intramuscular administration of Antisedan (atipamezole hydrochloride 5 mg/ml) at a dose of 0.2 mg/kg.

Surgical intervention

The surgical intervention was performed under strict aseptic and antiseptic conditions. The patient was positioned in a sternal position on the operating table, with a pillow placed under the caudal abdomen to elevate the pelvic region. After thorough preparation and disinfection of the surgical field, urethral catheterization was performed to prevent urethral damage during the operation. Two situational sutures with Polycon No. 2 (Tanzos 95-AD, Bulgaria) were placed at the base of the prolapsed mass. The aim was to secure the mass and exteriorize it as much as possible through the vulva, as well as to avoid possible reposition of the vaginal wall after its extirpation. Hemostatic forceps were placed dorsally and ventrally on the abnormal vaginal mass to isolate it from the intact vaginal wall during excision. Tissue removal was performed using a

Kentamed FR-B radiofrequency electrosurgical device (Kentamed, Bulgaria), which combines cutting and bipolar coagulation. A partial vaginectomy was performed, and the tumor-like mass was removed by deep excision. The wound edges were approximated and sutured with interrupted diagonally crossed sutures with absorbable PGA (Polyglycolic Acid) thread No. 0, round needle, 1/2, 30 mm, Kruuse. As a preventive measure to avoid subsequent recurrences, an ovariohysterectomy was also performed.

Postoperative period

The animal was administered the antibiotic Tercef® (ceftriaxone 1 g, Balkanpharma-Razgrad AD, Bulgaria), at 20 mg/kg body weight, intravenously, every 12 hours for four days, and the nonsteroidal anti-inflammatory drug Meloxidolor® (Meloxicam 5 mg/ml, Le Vet Pharma, Netherlands) at 0.2 mg/kg, administered twice intravenously every 24 hours. The urinary catheter was removed 48 hours after the operation. The animal recovered without problems within seven postoperative days. Six months later, clinical examination and imaging diagnostics revealed a satisfactory result without tumor recurrence and metastasis.

Pathoanatomical examination

Macroscopic alterations

Macroscopically, the tumor formation appeared as a limited, nodular structure with a hard-elastic consistency, a hemorrhagic appearance, and a diameter of approximately 7 cm (Fig. 1A). Upon dissection, the cut surface was pale, resembling fish meat (Fig. 1 B).

Histopathological examination

The tissue sample was processed according to routine histological techniques: dehydrated, embedded in paraffin, and cut into 5-µm sections. Hematoxylin and eosin (H&E) staining, Van Gieson staining, and immunohistochemistry for α-SMA were performed. Histopathological lesions were identified and documented with a Leica DM 5000 B microscope, equipped with a digital camera and original software.

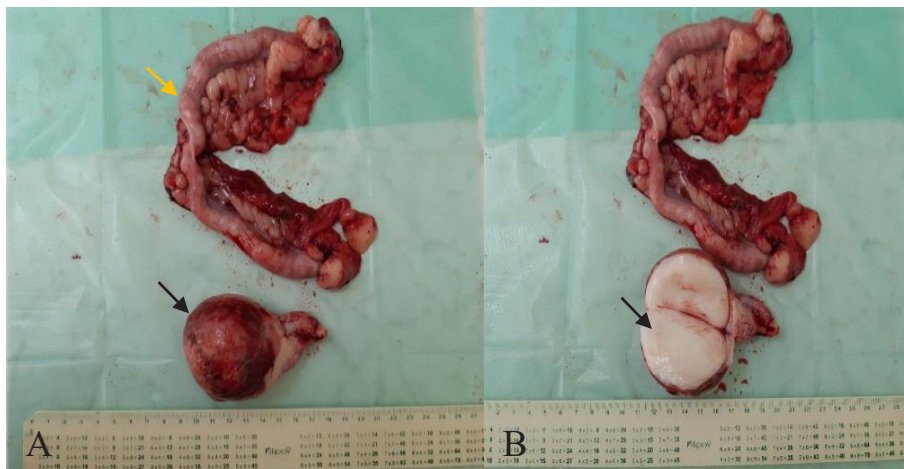


Figure 1. Surgically removed vaginal mass - black arrow (A, B); uterus with ovaries - yellow arrow (A).

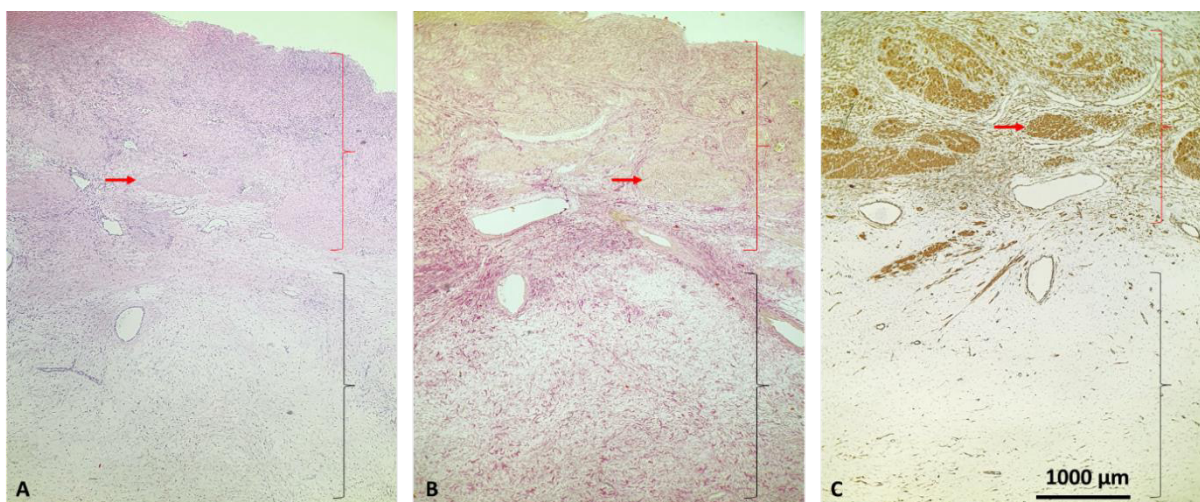


Figure 2. Hematoxylin and eosin staining (A), Van Gieson (B) and immunohistochemical staining for α -SMA (C): visible mucosa (red bracket) with smooth muscle fibers (red arrow) and a poorly delineated mesenchymal lesion in the submucosa (black bracket); magnification x 40

Microscopic description

The histopathological examination revealed a moderately cellular mesenchymal lesion consisting of a collagenous stroma and uniform cells with a bundle and whorl-like growth pattern (Fig. 2A, B, C). There was no evidence of cellular atypia or necrosis. The tumor cells were predominantly spindle-shaped with ovoid nuclei, fine chromatin, and inconspicuous nucleoli. The

cytoplasm was poorly defined and faintly eosinophilic (Fig. 3A). Collagen fibers were light pink on hematoxylin and eosin staining, while they were red on Van Gieson staining (Fig. 3B). On immunohistochemical examination, the tumor cells were negative for α -SMA, indicating a lack of smooth muscle genesis. As an internal control, a regular expression was observed in both mucosal and vascular smooth muscle cells (Fig. 3C).

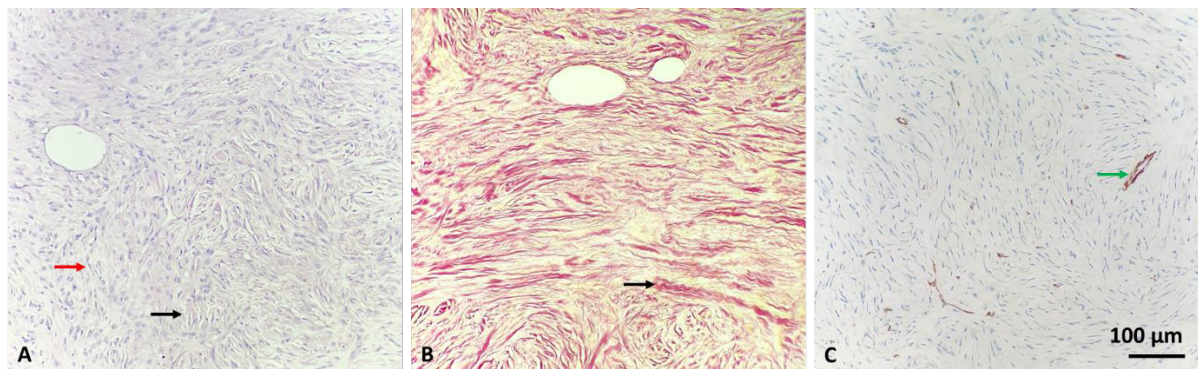


Figure 3. Hematoxylin and eosin staining (A) and Van Gieson staining (B) with faintly stained spindle cells (red arrow) and collagen fibers (black arrow); immunohistochemical examination (C) shows cells and fibers negative for α -SMA, with a positive internal control – smooth muscle of a blood vessel shows α -SMA expression (green arrow); magnification x 200

DISCUSSION

In this case, a vaginal fibroma was histopathologically identified in a 12-year-old female Cocker Spaniel. According to some authors, genital tract tumors are usually observed in middle-aged animals that have not been neutered (Klein, 2001). Vaginal prolapse, vaginal neoplasia, enlarged clitoris, and urethral tumors are common in bitches (Salomon et al., 2004; Tivers & Baines, 2010). Primary benign tumors of the vulva and vagina usually range from 71 to 82%, while malignant neoplasias represent a relatively small percentage (Thacher and Bradley, 1983; Hill et al., 2000). Cases of leiomyoma and lipoma of the vulva have been reported in bitches (Thacher and Bradley, 1983; Withrow and Susaneck, 1986). Vaginal leiomyoma, sometimes complicated by ovarian luteoma, has been reported in older bitches (Ichimura et al., 2010; Singh et al., 2014; Kula et al., 2022). Hemangiomas, hemangiosarcomas, and squamous cell carcinomas have been reported in rare cases (Thacher and Bradley, 1983; Withrow and Susaneck, 1986; Hill et al., 2000; Igna et al., 2016). In line with the above and based on our clinical cases, we also believe that benign vaginal neoplasias in bitches, are more common than malignant ones. Reproductive tract tumors may cause compression and obstruction of the urethra and rectum (Gupta et al., 2014). In

our case, anamnesis revealed that the animal exhibited dysuria, supporting the above statement. Preoperative examinations showed mild anemia, thrombocytopenia, and pronounced leukocytosis, while biochemical parameters remained within reference limits. Similar hematological and biochemical results were found in a 7-year-old bitch, with vaginal leiomyoma and ovarian luteoma (Kula et al., 2022). The authors defined these findings as a paraneoplastic syndrome accompanying neoplastic diseases of the reproductive tract in bitches. The imaging diagnostics performed in our clinical case excluded the presence of metastases in the examined organs. Thoracic radiography and abdominal ultrasonography are indicated in animals with suspected vaginal neoplasia, in order to confirm or rule out the presence of metastases (Salomon et al., 2004; Tivers and Baines, 2010). Some researchers recommend combining vaginal tumor removal with ovariohysterectomy to prevent subsequent recurrence of the neoplasia (MacLachlan and Kennedy, 2002; Verma et al., 2019). Accordingly, we performed a partial vaginectomy to remove the mass, complicated by ovariohysterectomy. It should be mentioned that in aggressive and large tumors, subtotal vaginectomy, accompanied by urethroplasty and ventral pelvic osteotomy, can be applied (Salomon et al., 2004). In our histopathological examination, in addition to hematoxylin and eosin staining, Van

Gieson staining and immunohistochemistry for α -SMA were applied. The tumor cells were predominantly spindle-shaped with ovoid nuclei and weakly eosinophilic cytoplasm, resembling fibrocytes. Collagen fibers appeared light pink when stained with hematoxylin and eosin, and red with Van Gieson. Similar pathomorphological studies were reported in a case of a bitch with vaginal fibromyoma (Aksu et al., 2024). Immunohistochemical examination proved that the tumor cells and collagen stroma were negative for α -SMA, indicating a lack of smooth muscle genesis in the studied tissue. The combination of the three examination methods significantly facilitated the diagnosis of vaginal fibroma. The presented clinical case closely resembles the clinical cases described by Genov (2021) and Balamurugan and Sivasudharsan (2021). In addition, vaginal fibroma needs to be differentiated from vaginal hyperplasia, vaginal polyps, lipoma, leiomyoma, angioleiomyoma, angioleiomyosarcoma, leiomyosarcoma, transmissible venereal tumor, squamous cell carcinoma, and adenocarcinoma.

CONCLUSION

In conclusion, the mandatory histopathological examination of all surgically excised tissues from the vaginal and vulvar regions in bitches, is essential for accurate diagnosis. The use of specific staining techniques, supported by immunohistochemistry, is crucial for the optimal demonstration and differentiation of vaginal neoplasia in bitches.

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Medical University, 1 Saint Kliment Ohridski Str., 5800 Pleven, Bulgaria.

Conflicts of interest

The author declares no conflict of interest.

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