

Hemorrhagic prostatic cyst in a dog - case report

Cisto hemorrágico prostático em cão - relato de caso

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Abstract

We present the case of a five-year-old intact mixed breed male dog with hemorrhagic prostatic cysts. The patient presented with hematuria, dysesthesia, and pain on abdominal palpation. Abdominal ultrasound, hematology, urinalysis, and biochemical evaluation tests were subsequently conducted. Laboratory tests revealed cloudy urine with bacteria, and countless red blood cells. On ultrasound examination, the prostate was severely enlarged, with heterogeneous and reduced parenchyma, surrounding a large cavity filled with anechoic material with moderate cellularity. The urinary bladder was markedly distended and had a round, hypoechogenic structure in the lumen. The patient was hospitalized and had significant, irreversible worsening of the clinical symptoms and died. Subsequently, necropsy of the patient was performed and a histopathological diagnosis of benign prostatic hyperplasia associated with the presence of a prostatic hemorrhagic cyst, prostatitis, and chronic cystitis with an intraluminal blood clot was made. To the best of our knowledge, this is the first report to describe the occurrence of a hemorrhagic cyst in a canine prostate, thus bringing important information from clinical and imaging findings to the veterinary routine.

Keywords: male, reproduction, ultrasonography.

Resumo

Apresentamos o caso de um cão macho de cinco anos de idade sem raça definida com cisto prostático hemorrágico. O paciente manifestava hematuria, disquesia e dor à palpação abdominal. Foram realizadas ultrassonografias abdominais subsequentes, hematologia, urinálise e testes de avaliação bioquímica. Os testes laboratoriais revelaram urina turva com bactérias e inúmeros glóbulos vermelhos. No exame ultrassonográfico, a próstata estava severamente aumentada, com parênquima heterogêneo e reduzido, circundando uma grande cavidade cheia de material anecoico com celularidade moderada. A bexiga urinária estava marcadamente distendida e tinha uma estrutura redonda e hipoeogênica no lúmen. O paciente foi internado e teve um agravamento significativo e irreversível dos sintomas clínicos e veio a óbito. Subsequentemente, foi realizada a necropsia do paciente e foi feito o diagnóstico histopatológico de hiperplasia prostática benigna associada à presença de um cisto hemorrágico prostático, prostatite e cistite crônica com um coágulo sanguíneo intraluminal. Tanto quanto sabemos, este é o primeiro relatório descrevendo a ocorrência de um cisto hemorrágico numa próstata canina, trazendo assim informações importantes dos resultados clínicos e de imagem para a rotina veterinária.

Palavras-chave: macho, reprodução, ultrassonografia.



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Introduction

The canine prostate can be affected by several conditions, the most common of which, is benign prostatic hyperplasia (BPH), which can progress to the formation of single or multiple cysts in the parenchyma (Souza et al., 2019) that have single or multiple formations (Olson et al., 1987; Paclikova et al., 2006). These structures can still be classified as retention cysts or paracysts and may progress to abscesses due to ascending infection (Mullen et al., 1990; Souza et al., 2019).

Ultrasound examination is essential for the detection of retention cystic or paraprostatic structures, which present as intraparenchymal cavities with well-defined margins of variable size and shape, normally filled with anechoic fluid (Black et al., 1998; Nyland & Mattoon, 2015). In some cases, the prostate may be asymmetrical due to the presence of larger cysts in the parenchyma, which has also been verified by ultrasound examination (Lopate, 2013).

The presence of cysts in human prostate tissue is common and is classified into six categories, including infectious or complicated hemorrhagic cysts that are related to benign prostatic hyperplasia, inflammatory disease, gland atrophy, ejaculatory duct obstruction, and cancer (Galosi et al., 2009; Herranz Amo et al., 1999).

The occurrence of prostatic hemorrhagic cysts in male humans is uncommon and is usually associated with cancer, mainly carcinomas, presenting with ultrasound characteristics similar to those of abscesses. In human patients, the elderly tend to show clinical signs related to the urinary tract, such as acute retention (Chen et al., 2008; Fung et al., 2020). In veterinary medicine, there are no reports of the occurrence of hemorrhagic prostatic cysts in dogs and cats.

The objective of this report was to describe a case of prostatic hemorrhagic cyst in a dog, with a description of the clinical symptoms, laboratory, ultrasound, macroscopy, and *post-mortal* histopathology findings of this present case.

Case description

Anamnesis

A 22 kg intact male, mixed-breed, five-year-old, canine was seen with the chief complaint of dysuria. According to the owner, the patient had drop urination-frequency and hematuria, in addition to dysesthesia and anorexia for a few days.

Clinical examination findings

On physical examination, the patient presented with pain on abdominal palpation. No abnormalities were observed in rectal temperature, mucosal color, cardiopulmonary auscultation, and heart and respiratory rates. The patient had a moderate degree of dehydration (7 to 10%), increased capillary perfusion time of three seconds.

Clinical suspicion

After evaluation, urocystolithiasis was suspected, and a hematological and biochemical profile, urinalysis, and ultrasound examination of the patient were requested.

Laboratory, radiographic and ultrasound examinations

Based on the hematological profile, moderate normocytic normochromic anemia, neutrophilia, lymphopenia, and mild anisocytosis were observed. Blood chemical analysis revealed a slight reduction in albumin levels and an increase in creatinine and urea levels. Urine was collected by catheterization, showing a dark brown color, altered odor, cloudy appearance, low density (Specific Gravity = 1,018), acidic pH (5.5), and the presence of occult blood. Squamous cells, countless red blood cells, five-ten leukocytes and cocci-like bacteria were also observed, suggesting bacterial cystitis and possible kidney disease.

To investigate the abdominal pain verified on physical examination and due to the suspicion of urinary calculus, an abdominal ultrasound was performed, verifying that the urinary bladder was severely distended and filled with anechoic content, bilateral renal pyelectasis due to possible acute injury, splenomegaly, and hepatomegaly. Additionally, ultrasound showed that the prostate was severely enlarged with heterogeneous and reduced parenchyma, limited to the periphery of the cystic structure measuring 5.75 cm in length and 5.43 cm in height, thus surrounding a large cavity area filled with anechoic content, with moderate cellularity (Figure 1).

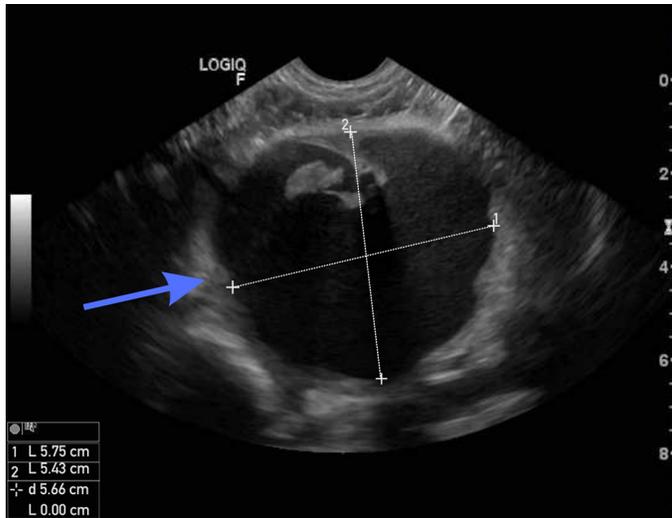


Figure 1. Ultrasonographic image of the dog's prostate with a prostatic hemorrhagic cyst.

Note: Note the loss of almost all prostatic parenchyma and marked presence of anechoic content with moderate cellularity (hemorrhagic cyst, blue arrow).

Therapeutic approaches and evolution of conditions

After consultation and complementary tests, the patient was hospitalized and medicated with methadone (0.2 mg/kg/ subcutaneous), buscofin (dipirona 50 g + hioscina 0,4 g) (25 mg/kg/intravenous), ondasterone (0.5 mg/kg/intravenous), omeprazole (1 mg/kg/intravenous), lactulose (10 mL/oral route), intravenous fluid therapy, and subsequent bladder lavage by tube.

The following day, the patient presented severe hematuria and a new ultrasound examination was performed, identifying a structure measuring approximately 7.08 cm x 5.8 cm, occupying most of the bladder lumen, suggestive of a clot and discrete parietal irregularity of the bladder. The urinary bladder (Figure 2) and prostatic cystic structure (Figure 3).

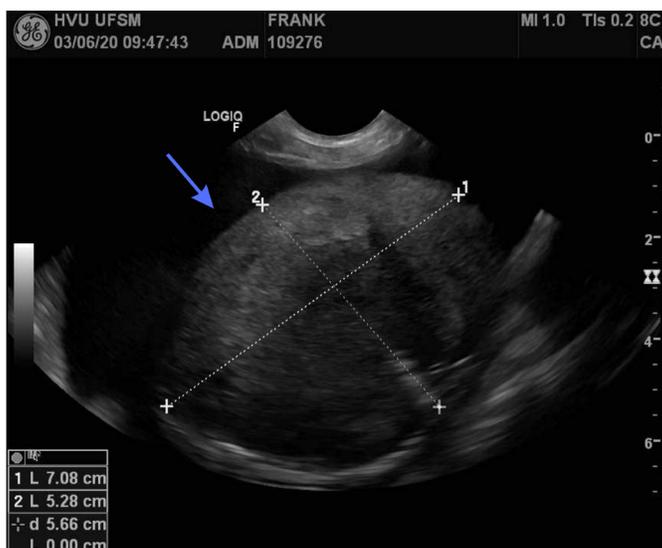


Figure 2. Ultrasonographic images of amorphous structure compatible with clot, urinary bladder.

Note: Amorphous intraluminal structure of mixed echogenicity (blue arrow), without the formation of a posterior acoustic shadow, occupying almost the entire bladder lumen and compatible with a clot.



Figure 3. Ultrasonographic image of the urinary bladder with an intraluminal clot (blue arrow) and prostate with a hemorrhagic cyst (green arrow).

Due to the unfavorable prognosis and worsening of the patient's clinical condition, euthanasia was performed, and patients remains were later referred for necropsy at the Veterinary Pathology Laboratory of the Federal University of Santa Maria (SEDIVET-UFSM).

Necropsy and histopathology

An autopsy report stated that the prostate was located outside the pelvic cavity due to the increase in volume and the presence of a large cyst in its ventral aspect, communication with the prostatic urethra, hyperplastic prostatic tissue, and a large amount of hemorrhage adjacent to the cyst. (Figure 4). The urinary bladder structure was confirmed as a bladder clot, and the bladder wall was moderately thickened by hemorrhage and a small amount of lymphoplasmacytic inflammatory infiltrate in the form of micronodules and multifocal areas of ulceration. Kidneys had cortical atrophy and intense diffuse generalized glomerulonephritis.

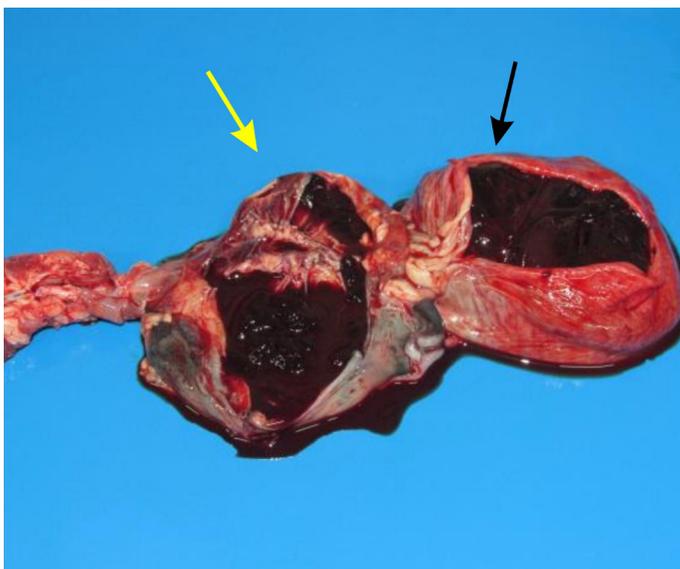


Figure 4. Photograph of the prostate with the presence of a hemorrhagic cyst (yellow arrow) and the bladder with the presence of a blood clot in its lumen (black arrow).

Histopathological diagnosis revealed cystic prostatic hyperplasia associated with hemorrhagic cysts and prostatitis; follicular cystitis associated with an intraluminal blood clot has also been described (Figure 5).

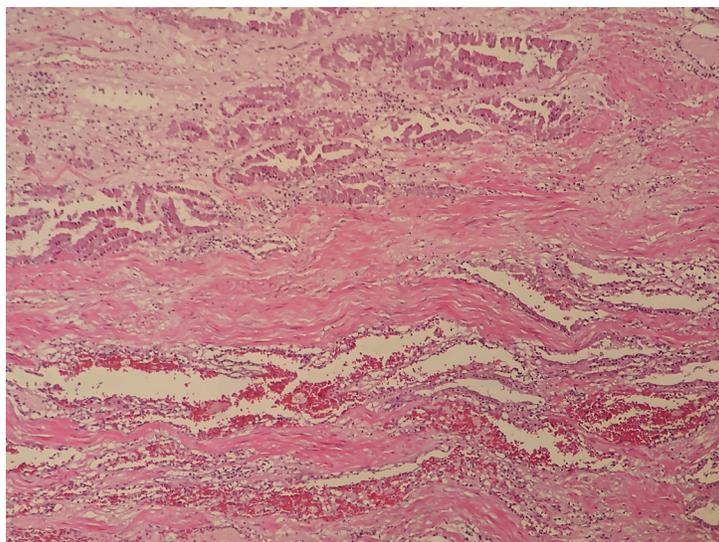


Figure 5. Prostate, canine.

Proliferation of epithelial cells forming papillae and tubules supported by delicate basal lamina (prostatic hyperplasia). Surrounding the tubules and glands, is an amorphous, basophilic material with abundant mononuclear inflammatory infiltrates. There is proliferation of spindle cells surrounded by a large amount of amorphous and eosinophilic material (collagen) near the prostatic hyperplasia area. There was abundant mononuclear inflammatory infiltrate and a large amount of hemorrhage between the collagen fibers. HE 20X.

Discussion

Prostatic diseases are common in elderly dogs and can manifest as prostatic syndrome. The most common clinical signs include dysuria, dripping of blood from the penis with or without urination, hematuria, and urinary infections unresponsive to medical treatment, tenesmus, dry or loose stools with a laminar shape, and limited mobility (Johnston et al., 2000). In the present report, the canine presented compatible signs described in the aforementioned literature, such as hematuria, dysuria, and dysesthesia, in addition to pain on abdominal palpation.

Complementary laboratory tests of patients with prostatic diseases may reveal neutrophilic leukocytosis with left shift, toxic and degenerated neutrophils, hematuria, pyuria, and bacteriuria, while the elevation of serum concentrations of alkaline phosphatase, alanine transaminase, and creatinine can also be observed (Smith, 2008). The most significant laboratory tests found in this patient included the presence of red blood cells in the urine and azotemia, in agreement with the findings of the aforementioned author.

According to Thrall et al. (2015), the increase in serum concentrations of urea and creatinine culminates in azotemia of prerenal, renal, or postrenal origin. Dehydration can result in elevated urea or creatinine levels in prerenal azotemia, which is a hypothesis for the patient in this report since he had dehydration and altered capillary refill time. Considering the renal injury suggested by the sonographic images and according to the same authors, renal azotemia may be observed in cases of renal injury, which was confirmed in this case by histopathology with the diagnosis of glomerulonephritis. The patient also presented with a history of dysuria and bladder distension, possibly secondary to urethral compression due to the presence of a prostatic cyst, raising the hypothesis of postrenal azotemia due to obstruction, corroborating the literature.

Prostatic disorders are diagnosed based on the presence of clinical signs and the detection of anatomical changes during palpation, radiography, and ultrasonography (Paclikova et al., 2006). The clinical signs presented by the patient in the present case included dyschezia, pain on abdominal palpation, and symptoms related to the urinary system. Ultrasound examination revealed a severe increase in prostatic dimensions. According to de Souza et al. (2017), prostatomegaly

is a common but non-specific finding. In some cases, prostate enlargement can be significant, with the organ losing its bilobed shape and becoming round (Davidson & Baker, 2009). In this case, a detailed evaluation of the prostatic parenchyma, such as contours and evaluation of the bilobed architecture, was not possible due to the presence of a large cavity area overlapping part of the prostatic architecture. However, it was possible to characterize some prostatic portions with a severe increase in their dimensions, heterogeneous parenchyma, and presence of cystic structures filled with anechoic content, with moderate cellularity, measuring 5.75 cm in length and 5.43 cm in height. The presence of cavitory areas in the prostate gland may be indicative of cysts, abscesses, or neoplasms (Lévy et al., 2014). According to Domingues (2009), hemorrhagic cysts and prostatic abscesses cannot be differentiated by ultrasound examination and usually appear as circumscribed structures filled with anechoic material with moderate or intense cellularity.

According to Nyland and Matton (2005), ultrasound imaging of the prostate does not, by itself, guarantee the ability to differentiate between neoplastic and inflammatory conditions, but the role of ultrasound in reproductive disease is to increase the accuracy and acuity of detecting anatomical abnormalities. Thus providing the subsequent ability to guide interventional procedures for the collection of tissue samples for a more accurate and definitive diagnosis. In this study, although ultrasound was not a method to establish a definitive diagnosis, as mentioned above, it proved to be efficient in excluding other differential diagnoses, such as the initial suspicion of urocystolithiasis, and would still be a tool to guide interventional procedures if the patient did not present an irreversible worsening of the condition.

Prostatic hemorrhagic cysts are uncommon in human males and are usually associated with cancer (Fung et al., 2020). A human case report by Chen et al. (2008) described the findings of a hemorrhagic cyst in the prostate of a male patient, revealing a cystic lesion over the apical portion of the prostate with the presence of anechoic content in its interior and several hypoechoic lesions, dispersed in the prostatic parenchyma. The clinical finding in the previous case was difficulty in urinating, with no other systemic complaints. According to the same authors, hemorrhagic cysts are rare in prostatic diseases, such as prostate cancer, prostatitis, and benign prostatic hyperplasia, and it is difficult to determine the cause of hemorrhage using ultrasound. Cytological examination of the aforementioned case revealed an adenocarcinoma. The authors believe that the cyst had developed due to cancer due to rapid and aggressive growth causing bleeding in the cystic lesion. In the present case, histopathological examination revealed benign prostatic hyperplasia associated with hemorrhagic cyst and prostatitis without associated neoplastic involvement; therefore, it is suspected that the blood present in the cystic lesion may be related to bleeding in the urinary bladder wall, since chronic cystitis was diagnosed on histopathological examination and communication of the cyst with the prostatic urethra.

In contrast to the cases in humans, the present report confirmed cystic prostatic hyperplasia (CPH) through histopathological examination, associated with hemorrhagic cyst and prostatitis without associated neoplastic involvement; this revealed cyst rupture causing hemorrhage (hemorrhagic cyst) and consequent communication with the urethra and urinary vesicle, originated from the bladder clot. The formation of large cysts is secondary to the coalescence of smaller cysts and is a frequent complication of cystic prostatic hyperplasia in dogs, causing vascular rupture and hemorrhage. Generally, the collection of blood inside the cyst is small, and they do not even form clots as the cystic liquid dissolves the coagulation factors and platelets; however, more rarely, if there is profuse hemorrhage, large clots (hematomas) may form, which fill the cystic lumen completely. Follicular cystitis is an incidental finding secondary to urinary retention due to prostatic hematoma (Foster, 2016)

Conclusion

This is the first report to describe the occurrence of a hemorrhagic cyst in a canine prostate, bringing important correlations between clinical, imaging, and histopathological findings to routine veterinary practice. The histopathological report revealed rupture of a large prostatic cyst as part of prostatic hyperplasia, thus causing bleeding into the cyst. In this study, it was not possible to perform interventional procedures for further information because of the clinical and irreversible worsening of the condition; however, ultrasonography proved valuable in excluding the primary hypothesis of urocystolithiasis and allowing the detection of prostatic lesions, thus assisting in the therapeutic management of the case.

Ethics statement

All procediments were consented by the animal owner.

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None.

Conflict of interests

No conflict of interests declared concerning the publication of this article.

Authors' contributions

BBL, BSPM, DJR, BL, TMP, TRF, MARF - Development of methodology; preparation and writing the initial draft, Writing, Review and Editing manuscript. RAF, RP, MARF - Review and Editing manuscript, Writing, Review and Editing manuscript.

Availability of complementary results

The authors must identify where readers can access any complementary information available, such as in an online repository or from the authors on request. We suggest consulting https://wp.scielo.org/wp-content/uploads/Lista-de-Repositorios-Recomendados_pt.pdf

The study was carried out at Setor de Diagnóstico por Imagem da Universidade Federal de Santa Maria, Santa Maria, RS, Brasil.

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