Opis przypadku *Case report*

Extraprostatic cysts in dogs: Case report

BARBARA SZCZEPANKIEWICZ[1], PRZEMYSŁAW PRZĄDKA[2], DOMINIKA KUBIAK-NOWAK[2], BARTŁOMIEJ LISZKA[2], WOJCIECH BORAWSKI[2], ŁUKASZ JUŹWIAK[2], URSZULA PASŁAWSKA[3]

[1]Department of Epizootiology and Clinic for Birds and Exotic Animals, Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences, Grunwaldzki Sq. 45, 50-366 Wrocław, Poland
[2]Department and Clinic of Surgery, Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences, Grunwaldzki Sq. 51, 50-366 Wrocław, Poland
[3]Institute of Veterinary Medicine, Department of Biological and Veterinary Sciences, Nicolaus Copernicus University, Lwowska 1, 87-100 Toruń, Poland

Received 04.10.2024 *Accepted 02.12.2024*

Szczepankiewicz B., Prządka P., Kubiak-Nowak D., Liszka B., Borawski W., Juźwiak Ł., Pasławska U.
Extraprostatic cysts in dogs: Case report

Summary

In veterinary practice, prostatic gland disorders are the most common diseases of the reproductive system in males. The article discusses various prostatic gland disorders in dogs, focusing on prostatic cysts. It indicates that the most frequently occurring prostatic disorders are benign hyperplasia and inflammation, while cysts account for about 5% of cases. Diagnosis involves clinical examination, ultrasound and radiographic examination. Treatment of prostatic cysts can be pharmacological, including chemical castration, or surgical, including marsupialization and omentalization. In this paper, the authors report their diagnosis and treatment of extraprostatic cysts in a dog.

Keywords: prostatic gland, prostatic cysts, omentalization, marsupialization, castration

In veterinary medicine, prostatic disorders represent the most prevalent issues in the reproductive system of male dogs. Epidemiological studies estimate that among prostatic diseases, benign prostatic hyperplasia (45.9%) and prostatitis (38.5%) are the most frequently observed conditions. Prostatic abscesses (7.7%) and cysts (5.0%) occur less commonly, while neoplasms (2.6%) and prostatic squamous metaplasia (0.2%) are rare. Unlike small and miniature breeds, large and giant breed dogs are significantly more susceptible to prostatic diseases (except prostatic neoplasms). Breeds predisposed to these disorders include German Shepherds, Rottweilers, American Staffordshire Terriers, Bernese Mountain Dogs, and Beaucerons (11). Prostatic diseases predominantly manifest in older dogs, typically those over six years of age (13).

Prostatic cysts are thin-walled cavities filled with a clear, non-purulent fluid ranging from pale yellow to orange. These cysts may develop within the prostatic parenchyma (intraparenchymal cysts) or externally (extraparenchymal cysts). Prostatic cyst formation is often associated with benign prostatic hyperplasia and squamous metaplasia as due to ductal obstruction. This obstruction leads to epithelial changes, including squamous metaplasia, cellular hyperplasia, oedema, inflammatory infiltration, fibrosis and increased secretion production. These alterations further elevate pressure on the excretory ducts, contributing to cyst formation. Subsequently, ductal obstruction progresses, impeding the flow of prostatic secretions and promoting the formation of multiple, initially small cysts that eventually coalesce and expand (5).

Clinical signs. Prostatic cysts are often asymptomatic in early stages. Over time, however, they tend to increase in size. In some cases, the volume of the cysts can exceed that of the prostate itself. Dogs with advanced glandular pathology may develop clinical signs, such as hematuria, lethargy, anorexia, painful defecation and urination, stranguria and urethral bleeding. Faeces may appear flattened due to compression of the rectum by the enlarged prostate. In some animals, large cysts exert pressure on the ureters or their entry points, as well as on the urethra, leading to urine retention and significant pain, which can ultimately result in lameness (5).

Diagnostics. Diagnosis of prostatic diseases relies on history-taking, clinical examination (including rectal examination), ultrasonography, and radiographic imaging (13). Rectal examination in dogs makes it possible to assess the shape, consistency and sym-

metry of the prostate, which may indicate conditions such as prostatic hyperplasia, inflammation, cysts or neoplasia. However, due to the prostate's deep anatomical location in the pelvic cavity, accurate evaluation via rectal palpation is challenging, particularly in larger individuals. Furthermore, palpable findings are often nonspecific, and the limited sensitivity of this method precludes the detection of small lesions or early-stage prostatic disease. For this reason, rectal examination should be supported with ultrasonography, which makes it possible to perform a precise structural evaluation of the prostate and identify potential pathologies. Ultrasound can be used for a non-invasive visualisation of the prostate's location, measurement of its size and assessment of glandular structure. The location, size, and appearance of the prostate vary with age and health history in intact male dogs, whose prostate size is influenced by age and body weight (8). On ultrasound, a healthy prostate in an intact male dog should have smooth margins and exhibit homogeneous echogenicity with fine texture. However, accurate assessment of the prostate and the surrounding tissues becomes challenging when multiple large, thin-walled cysts are present (9).

In cases where large cysts are suspected, a radiographic survey of the caudal abdomen is recommended. On radiographs, a soft tissue density area may appear adjacent to or overlapping the urinary bladder (6). For smaller cysts, the size of the prostatic shadow can be evaluated. When prostatic cysts are significantly enlarged and indistinguishable from the bladder, cystography (filling the bladder with contrast medium) is advised to delineate the bladder outline.

Treatment. For asymptomatic animals with incidental findings of mild prostatic enlargement (e.g., during routine abdominal ultrasound or rectal examination), treatment is usually not initiated, and instead, periodic ultrasound follow-up is recommended to monitor disease progression. For animals showing clinical signs of prostatic hypertrophy, castration is commonly recommended. Until recently, surgical castration was the preferred treatment method. However, since 2008, deslorelin acetate implants (a gonadotropin-releasing hormone [GnRH] analogue) have provided an additional therapeutic option for treating prostatic hypertrophy in Europe. Deslorelin acetate temporarily inhibits synthesis and/or secretion of follicle-stimulating hormone and luteinizing hormone, facilitating reversible pharmacological castration by reducing serum testosterone levels, which leads to infertility approximately six weeks post-implantation, with effects lasting at least six months. In dogs under 10 kg, decreased testosterone levels have been maintained for over 12 months (10), and 98% of males return to baseline testosterone levels within 18 months post-implantation. This therapy is particularly beneficial for dogs at high anaesthetic risk. Although originally registered for use in dogs, this medication has also been successfully administered in other species, such as coyotes and cats (4, 7, 12).

In some cases, treatment is supplemented with estrogens, progestogens, antiandrogens or 5α-reductase inhibitors, as well as antibiotics if purulent changes are suspected (10). This approach is recommended for animals with cysts no larger than 1 cm in diameter. For cysts larger than 1 cm, castration (surgical or pharmacological) and surgical excision of the cyst are advised (1, 3).

During surgery, it is recommended to collect cyst material for culture to exclude bacterial infection and differentiate cysts from abscesses (8). A prostatic biopsy may also be performed to distinguish benign prostatic hyperplasia from neoplastic changes. Several surgical options for cyst treatment, combined with castration, include ultrasound-guided drainage, marsupialization, omentalization and cryoablation (partial freezing of the prostate).

Marsupialisation is one of surgical techniques used in the treatment of prostatic cysts. It involves incising the cyst wall, removing its contents, and suturing the incised edges of the cyst wall to the abdominal wall. This prevents displacement, re-closure, and refilling of the cyst.

Omentalisation for intraprostatic cysts involves making two incisions in the cyst and removing its contents. The cyst is then irrigated – for example, with physiological saline or a mild antiseptic solution. The omentum is passed through the openings in the cyst wall to create drainage, filling the lumen of the remaining cyst with the greater omentum. Finally, sutures are placed to connect and secure the omentum to the cyst wall (omentopexy).

In the case of extraprostatic cysts, the aim is to remove as much of the cyst wall as possible. Then, to minimise the risk of fluid accumulation and cyst recurrence, the prostate gland is wrapped with omentum.

Each surgical technique, in addition to its obvious advantages, carries a certain operative risk. Therefore, each patient should be individually evaluated, and the owner should be informed about potential intraoperative and postoperative complications.

Prostatic cysts are a common complication of benign prostatic hyperplasia in male dogs and an indication for therapeutic intervention. Treatment should be tailored to the individual patient to minimise risks while achieving optimal therapeutic outcomes. This article presents the case of a 12-year-old German Shepherd with urinary retention signs secondary to prostatic cysts, illustrating the effectiveness of diagnostic and surgical treatment approaches in such cases.

Case report

Animal description. The patient was an intact male German Shepherd aged 12 years and 2 months.

History and clinical examination. The dog was referred to the Department of Internal Medicine with the Clinic of

Horses, Dogs, and Cats and the Department and Clinic of Surgery at the Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Sciences due to difficulties in defecation and severe abdominal pain. Additionally, the owner reported a one-month history of weight loss, decreased activity and reduced appetite. On rectal examination, an enlarged prostate gland was noted.

Laboratory blood test results. Haematology: leukocytes – 16.3 G/L, erythrocytes – 7.53 T/L, haemoglobin – 10.0 mmol/L, hematocrit – 0.502 L/L, MCV – 67 fl, MCHC – 20.0 mmol/L, MCH – 1.33 fmol, platelets – 155 G/L, lymphocytes – 0.6 G/L (↓), monocytes – 0.4 G/L, granulocytes – 15.3 G/L (↑), RDW – 15.4% (↓ indicates values below the physiological range; ↑ indicates values above the physiological range).

Biochemistry: AspAT – 27 U/L, ALAT – 47 U/L, urea – 5.3 mmol/L, creatinine – 66 µmol/L (↓), DGGR lipase – 78 U/L, total protein – 70 g/L, fibrinogen – 1.83 g/L, APTT – 18.7 s, serum glucose – 5.4 mmol/L, PT – 7.4 s (↓ indicates values below the physiological range).

Ultrasonographic and radiographic findings in the abdominal cavity. An abdominal ultrasound was performed using a microconvex probe with a frequency of 3-9 MHz and a linear probe of 4-13 MHz (Esaote MyLab Class C, Genoa, Italy). Two thin-walled, ovoid, anechoic fluid-filled structures were detected in the caudal abdomen (Fig. 1a and 1b). Due to the large size of these structures and the inability to clearly differentiate them from the urinary bladder, a supplementary survey radiograph of the caudal abdomen was taken using a digital indirect radiography system with a Vertix IIID X-ray unit and a Siemens Polydoros LX 30 tube (Siemens, Erlangen, Germany) (Fig. 2a). The radiograph showed a soft-tissue density area near the urinary bladder, measuring approximately 143 × 211 mm. To delineate the bladder outline, cystography and another caudal abdominal radiography were performed (Fig. 2b), leading to the final diagnosis of extraprostatic cysts.

Treatment of the case. After clinical assessment and analysis of the current blood test results, the patient was qualified for general anaesthesia and surgical intervention. Sedation was achieved by intramuscular administration of a combination of medetomidine (0.01 mg/kg, Sedator 1 mg/mL, Eurovet Animal Health B.V., Bladel, Netherlands) and methadone (0.2 mg/kg, Comfortan 10 mg/mL, Eurovet Animal Health B.V., Bladel, Netherlands). A catheter was then inserted into the cephalic vein. General anaesthesia was induced with propofol (1 mg/kg, Propofol Lipuro 10 mg/mL, B. Braun, Melsungen, Germany), followed by endotracheal intubation, connection to an inhalation anaesthesia machine (Mindray Wato-Ex 65 pro, Shenzhen, China) and initiation

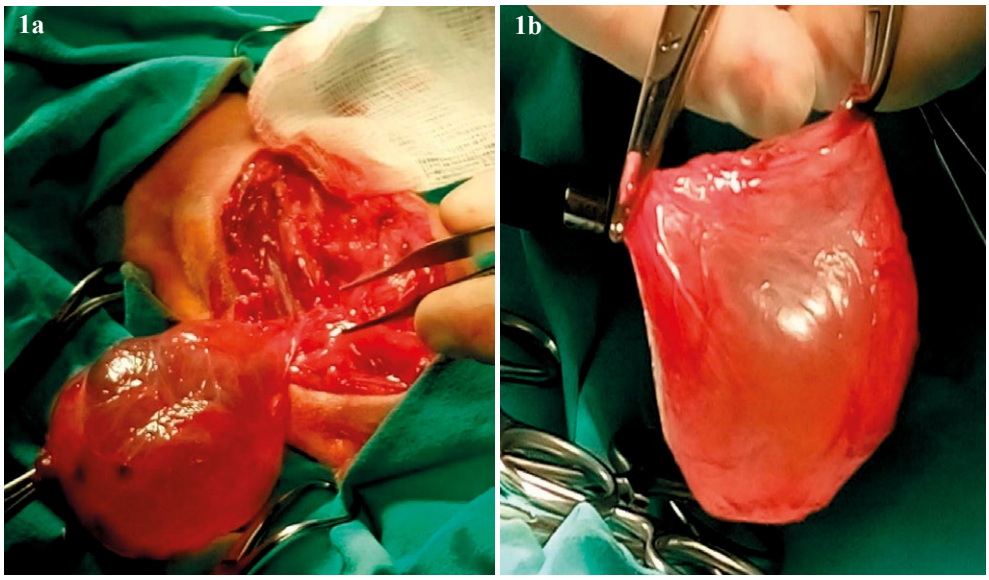

Fig. 1a and 1b. Thin-walled, ovoid fluid-filled prostatic cysts
Explanations: 1a – the cyst prior to resection, 2b – the cyst post-resection

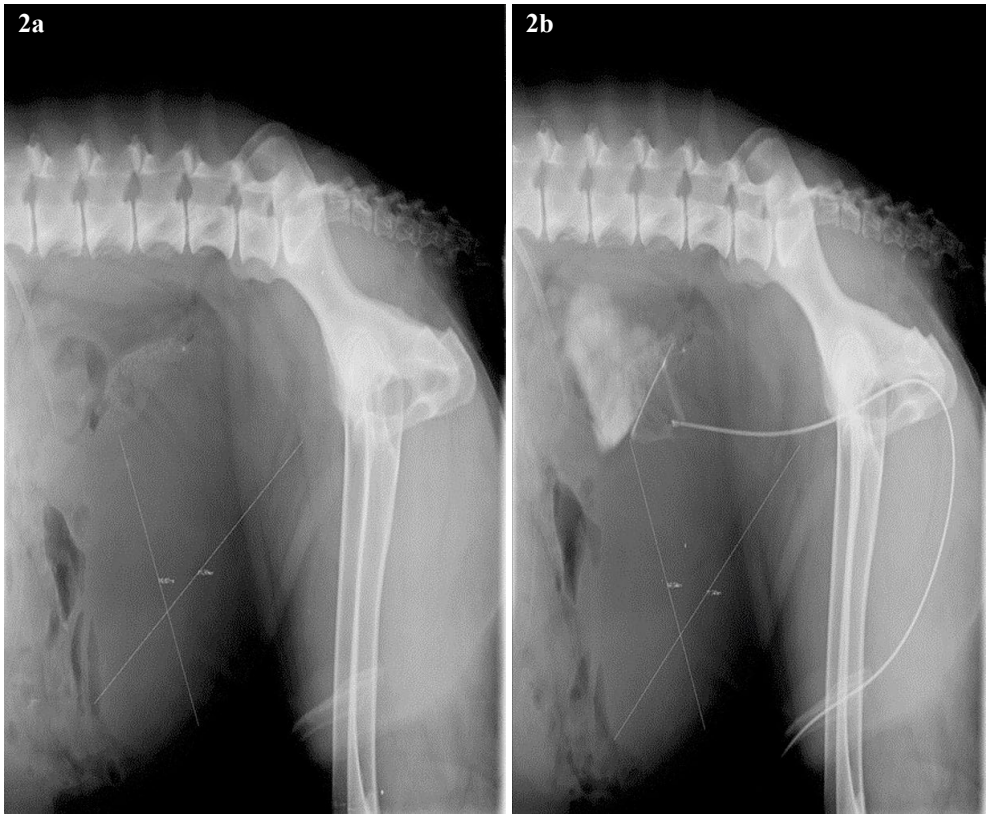

Fig. 2a and 2b. 2a – survey radiograph of the caudal abdomen
Explanations: 2b – follow-up radiograph of the caudal abdominal region post-cystography

of inhaled isoflurane. Local anaesthesia was provided by the hanging drop technique through epidural injection of a 2% lignocaine solution (Lignocainum Hydrochloricum WZF 2%, 3 mg/kg, Polfa Warszawa S.A., Warsaw, Poland). Additional intravenous metamizole (50 mg/mL, Pyralgivet 500 mg/mL, VetAgro, Lublin, Poland) was administered. Postoperative analgesia included carprofen (Rimadyl, Zoetis, Warsaw, Poland) for five days at a daily dose of 4 mg/kg and prolonged-release tramadol tablets (Poltram, Polpharma, Starogard Gdański, Poland) at 5 mg/kg every 12 hours for five days.

Description of the surgical procedure. After placing the patient in a supine position and preparing the surgical field according to standard aseptic and antiseptic procedures, the surgical procedure was initiated via a midline umbilical laparotomy. After accessing the abdominal cavity, surgical management of the extraprostatic cysts was undertaken. The cysts were dissected from the surrounding tissues. After aspirating fluid from the cysts with a syringe for cytological and microbiological analysis, small incisions were made in the cyst walls, and the contents were evacuated with a surgical suction device. The cyst walls were then partially resected, leaving small sections close to the prostatic tissue. These residual cyst wall segments were flushed with sterile saline (Sterofundin, B. Braun, Melsungen, Germany), and any remaining fluid was aspirated. The final step was omentopexy, wherein the remaining cyst wall fragments were sutured to the greater omentum at several points using absorbable interrupted sutures (Monosyn, size 0, B. Braun, Melsungen, Germany). Following a meticulous examination of the surgical site and confirming no signs of bleeding, the abdominal wall was closed in layers using absorbable sutures (Monosyn, size 0, B. Braun, Melsungen, Germany). Finally, traditional surgical castration was performed.

In this case, microbiological culture was sterile, thus eliminating the need for targeted antibiotic therapy. The simple interrupted sutures were removed from the skin on the 12th postoperative day, following complete wound healing. Observations from the owners indicated that a few days after the surgery, the dog regained full mobility and vigor, actively engaging in play and daily activities with newfound vitality.

Conclusion

Prostatic disorders are common in male dogs, with prostatic cysts representing a less frequent, but potentially serious, condition. Initial diagnostics are based on history-taking, clinical examination and imaging techniques. In asymptomatic cases, treatment may not be necessary, whereas advanced cysts often require surgical intervention. Marsupialization and omentalization are effective surgical methods aimed at permanently resolving cysts and preventing recurrence. Individualised patient management is essential to minimise surgical risks and achieve optimal therapeutic outcomes. This case of a 12-year-old German Shepherd with prostatic cysts demonstrates the effectiveness of diagnostic and surgical approaches for such conditions.

References

1. *Aissi A., Khadidja M.*: Canine Prostatic Disorders. Veterinary Medicine 2017, 83-90.
2. *Andriole G., Bruchovsky N., Chung L. W., Matsumoto A. M., Rittmaster R., Roehrborn C., Russell D., Tindall D.*: Dihydrotestosterone and the prostate: the scientific rationale for 5alpha-reductase inhibitors in the treatment of benign prostatic hyperplasia. Journal of Urology 2004, 172, 1399-403.
3. *Black G. M., Ling G. V., Nyland T. G., Baker T.*: Prevalence of prostatic cysts in adult, large-breed dogs. Journal of the American Animal Hospital Association 1998, 34, 177-180.
4. *Fontaine C.*: Long-term contraception in small implant: A review of Suprelorin (deslorelin) studies in cats. Journal of Feline Medicine and Surgery 2015, 17 (9), 766-771.
5. *Krawiec D. R., Heflin D.*: Study of prostatic disease in dogs: 177 cases (1981-1986). Journal of the American Veterinary Medical Association 1992, 200, 1119-1122.
6. *Lattimer J. C.*: The prostate gland. Thrall D. E. (ed.): Textbook of Veterinary Diagnostic Radiology. W.B. Saunders Company, Philadelphia, PA, USA 1998, p. 499-511.
7. *MacGregor M. J., Asa C. S., Skinner D. C.*: Variable duration of reproductive suppression in male coyotes (Canis laterans) treated with a high dose of the gonadotropin-releasing hormone agonist deslorelin. Reproduction, Fertility and Development 2017, 29 (7), 1271-1279.
8. *Penninck D., D'Anjou M. A.*: Atlas ultrasonografii małych zwierząt. Edycja druga. Galaktyka 2016.
9. *Poclakovia P., Kohout P.*: Diagnostic possibilities in the management of canine prostatic disorders. Veterinarni Medicina 2006, 51, 1-13.
10. *Polisca A., Orlando R., Troisi A., Brecchia G., Zerani M., Boiti C., Zelli R.*: Clinical efficacy of the GnRH agonist (Deslorelin) in dogs affected by benign prostatic hyperplasia and evaluation of prostatic blood flow by Doppler ultrasound. Reproduction in Domestic Animals 2013, 48, 673-680.
11. *Polisca A., Troisi A., Fontaine E., Menchetti L., Fontbonne A.*: A retrospective study of canine prostatic diseases from 2002 to 2009 at the Alfort Veterinary College in France. Theriogenology 2016, 85, 835-840.
12. *Romagnoli S., Baldan A., Righetti C., Milani C., Mollo A., Stelleta C.*: Semen quality and interval to sterility in tom cats treated with a 9.4 mg deslorelin implant. Journal of Feline Medicine and Surgery 2017, 19 (2), 194-199.
13. *Smith J.*: Canine prostatic disease: A review of anatomy, pathology, diagnosis, and treatment. Theriogenology 2008, 70, 375-383.

Corresponding author: Barbara Szczepankiewicz, DVM, PhD, Grunwaldzki Sq. 45, 50-366 Wrocław, Poland; e-mail: barbara.szczepankiewicz@upwr.edu.pl