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CASE REPORT

Acute colonic impaction and faecaloma due to canine benign prostatic hyperplasia – Case report

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ABSTRACT

The present case report describes the clinical signs and case resolution of an intact 9-year-old male crossbreed dog with spontaneous constipation. The dog presented with abdominal pain, lack of appetite, tenesmus and without signs of defecation in the last 4 days. No important alterations were observed in the complete blood count and biochemistry. A substantial obstruction caused by a faecaloma and a prostate with increased size was observed on X-rays. Benign prostatic hyperplasia (BPH) was confirmed by ultrasonography (size: 48.29 cm^3) and by testing the serum canine prostate-specific arginine esterase concentration (105.97 ng/mL). Colon impaction was resolved with rectal enemas within two days. BPH was treated with osaterone acetate. Ultrasonographic checks were performed after 60 and 180 days from the demission and a concrete constant reduction of prostatic volume and of the clinical signs was established. Faecaloma is an uncommon finding in male dogs, and it occurs especially as a consequence of BPH. Colon impaction in patients with BPH is usually subclinical, but it is important to underline how, in severe cases, perforation of the colon and faecal peritonitis can occur, leading to fatal conditions for the animal. In conclusion, prostatic enlargement should always be considered in male dogs suffering from colonic impaction.

KEYWORDS

faecaloma, benign prostatic hyperplasia, canine prostate-specific arginine esterase, osaterone acetate, prostate

INTRODUCTION

The prostate is the unique accessory sex gland of the male dog. It possesses two lobes that surround the urethra distal to the bladder and provides secretions for an adequate environment for sperm survival and transport (Branam et al., 1984). Its growth and size depend on the age, breed and body size of the dog and are mediated by testosterone (Ruel et al., 1998; Cunto et al., 2019). Canine benign prostatic hyperplasia (BPH) is one of the most common age-related diseases in adult intact male dogs older than 6 years (Smith, 2008; Nizanski et al., 2014). The pathogenesis of BPH is related to the increase in the oestrogen/testosterone ratio and the shift that promotes the activity of the 5α-reductase enzyme catalyzing the formation of dihydrotestosterone (DHT) from testosterone, with higher affinity to prostatic tissue (Brendler et al., 1983). The diagnosis of BPH can be made on the basis of history, physical examination, prostatic imaging (ultrasonography, Doppler, computed tomography) and palpation or laboratory findings with the canine prostate-specific arginine esterase (CPSE) being the most abundant secretory product and the most reliable indicator (Zelli et al., 2013; Kuhnt et al., 2017; Alonge et al., 2018; Cunto et al., 2019). Typical clinical signs, such as serosanguinous urethral discharge or haemospermia, may appear once the condition has progressed to the point of prostatic enlargement (Smith, 2008). Other common signs associated with BPH may include rectal tenesmus, constipation, dysuria, incontinence, stranguria, and caudal abdominal pain due to excessive prostatic enlargement (Krawiec and Heflin,

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1992). Even if clinical signs are present when the condition evolved to pathologic, it is very common to find asymptomatic dogs suffering from BPH (Cunto et al., 2019). For this reason, early detection of prostatic conditions should be assessed starting at 40% of the dog's life expectancy (Mantziaras et al., 2017). For preventive examination of the prostate, transrectal digital palpation, ultrasonography, radiography or CPSE assay are recommended (Mantziaras et al., 2017; Alonge et al., 2018). As testosterone plays an important role in the development of BPH, surgical removal of both testes has always been considered the treatment of choice. Nevertheless, a medical treatment should be considered in dogs with a potential breeding (Smith, 2008; Nizanski et al., 2014). Osaterone acetate (Ypozane, Virbac, Carros, France) is the latest product developed for the treatment of canine BPH showing an antagonist effect on androgen receptors at prostatic level that lasts for approximately 6 months (Tsutsui et al., 2000, 2001). It has been shown that the prostatic volume decreased by 62.6% one week after treatment with osaterone acetate (OSA) and returned to its enlargement after 6–8 months post-treatment (Tsutsui et al., 2000). For this reason, if a longer effect is required, the treatment should be performed twice a year.

CASE PRESENTATION

A 9-year-old, intact, 35 kg, crossbreed male dog was referred to the first-aid service of the Veterinary Teaching Hospital of the University of Padova due to abdominal pain, lack of appetite and tenesmus, with no signs of defecation during the last 96 h. The dog's preventive programs including vaccination and heartworm prevention were current, and it did not present any pathologies to date. The dog was fed with commercial diet, but the owner reported the inclusion of beef bones in the food three weeks before the day of referral and could not exclude the possibility of ingestion of a foreign body.

On clinical examination on the day of referral, the dog was alert and clinical parameters (temperature, pulse, respiration and peripheral lymph nodes) were normal, excluding signs of strong pain revealed during the palpation of both the cranial and the caudal abdomen.

Complete blood count and biochemistry (Advia 120, Siemens, Milan, Italy; Bt 3500, Biotecnica, Rome, Italy) revealed mild leukocytosis (22.16 × 10^3/μL), mild dehydration and mild increase of the C-reactive protein (1.59 mg/dL).

Lateral and dorsoventral abdominal radiographs were performed (Philosophy HF400, IPS Medical, Milan, Italy) showing the presence of a large faecaloma (5.61 × 5.29 cm) on the last part of the colon followed by faecal material (21 cm) mixed with radiopaque contents resembling bones. In addition, an increase in prostate size was observed with dorsal compression of the colon. No foreign bodies were detected in the abdominal cavity (Fig. 1A–B). Abdominal ultrasonography revealed the presence of an irregular splenic nodule, prostatic enlargement and a heterogenic prostatic parenchyma containing multiple cysts of different diameters

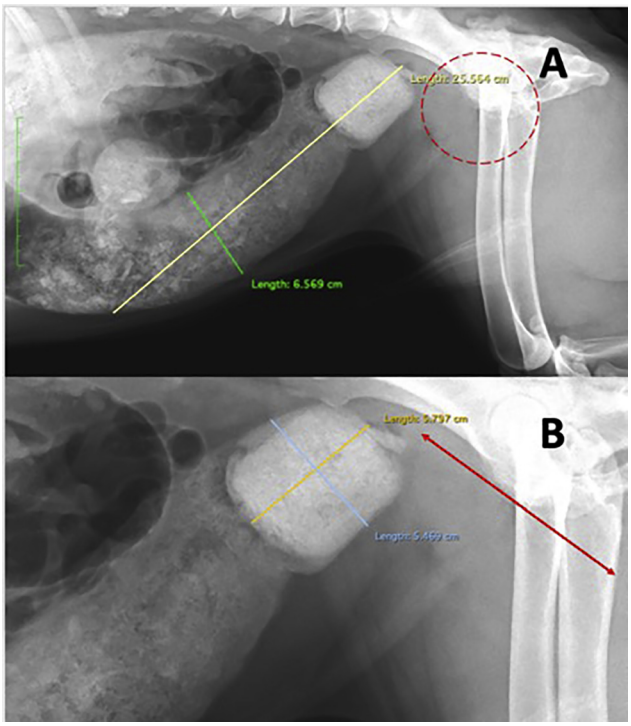

Fig. 1. (A). Abdominal lateral radiograph of a 9-year-old male dog with a colonic distension of 6.5 cm (green line) due to the accumulation of faecal material occupying 25.5 cm of the colon (yellow line) because the presence of a faecaloma. The faecaloma can be observed cranial to the prostate (red pointed line) with dorsal compression of the colon. *(B).* Abdominal lateral radiograph of a 9-year-old male dog. Red line indicates the prostate caudal to the faecaloma measuring 5.8 cm (yellow line) per 5.4 cm (blue line)

(4.5–8.5 mm). The prostatic volume was assessed by the formula: V (cm^3) = ([largest craniocaudal diameter × transverse diameter × dorsoventral diameter]/2.6) + 1.8, as has been reported previously (Kamolpatana et al., 2000). Its size was calculated to be 48.29 cm^3 (Fig. 2). Once the

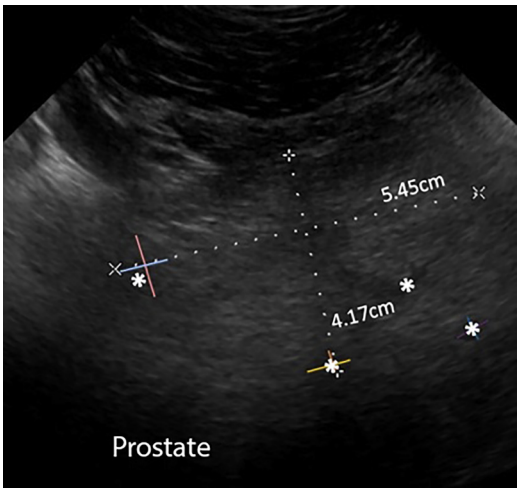

Fig. 2. Transversal image of the prostate of a 9-year-old dog. Prostatic width measures 5.45 cm and prostatic height measures 4.17 cm. White asterisks represent prostatic cysts

prostatic volume was determined, serum CPSE was measured (Speed-reader, Virbac, Milan, Italy) and found to be 105.97 ng/mL, confirming the diagnosis of benign prostatic hyperplasia (Alonge et al., 2018).

In order to empty the bowel and remove the faecaloma, an enema with a dilution of 20 g of Vaseline in 500 mL of 37 °C water was performed under sedation with 0.15 mg/kg of methadone IM (Semfortan, Dechra, Torino, Italy) and 0.004 mg/kg dexmedetomidine IM (Dexdomitor, Zoetis, Rome, Italy), followed by an IV constant rate infusion (CRI) with propofol (Proposure, Merial, Milan, Italy). Control radiographs after the enema showed complete erosion of the faecaloma, but abundant faecal material was still present in the proximal and medial parts of the colon (Fig. 3).

After sedation, the dog was recovered in the veterinary hospital where a medical therapy was started. It consisted of IV restoration of hydration with 3 mL/kg/h fluid therapy (Ringer Lactate, SALF, Padova, Italy), 0.7 mg/kg IV pantoprazole (Pantoprazole, Teva, Milan, Italy) for gastric protection twice daily, empiric antibiotic therapy with 20 mg/kg IV amoxicillin-clavulanic acid (Amoxicillin-Clavulanic Acid, Sandoz, Rovereto, Italy) twice daily, 0.1 mg/kg meloxicam (Metacam, Boehringer Ingelheim, Padova, Italy) as single day administration and lactulose (4 mL, single day administration).

One day after recovery, abdominal radiographic examination was repeated to check the progression of the faecal material, revealing no changes in intestinal transit. For this reason, another IM sedation with 0.15 mg/kg methadone (Semfortan, Dechra, Torino, Italy) and 0.004 mg/kg dexmedetomidine (Dexdomitor, Zoetis, Rome, Italy) and another IV CRI with propofol (Proposure, Merial, Milan, Italy) were performed in order to do a new enema. Control radiographs after the enema showed complete emptiness of the intestine. Nevertheless, the dog continued to show tenesmus and severe difficulties during defecation and was kept for recovery for another 24 h.

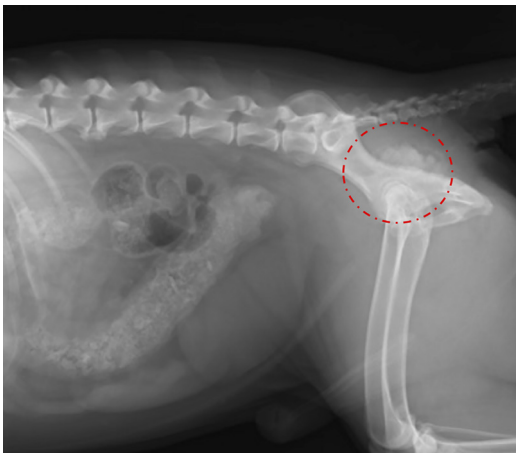

Fig. 3. Abdominal lateral radiograph of a 9-year-old male dog with acute constipation after the removal of a faecaloma. Structures of calcified density can be observed in the faecal content resembling bones. Prostatic gland is signaled (red pointed line)

On the second day after referral, blood gas analysis and a complete blood cell count were performed to control general clinical condition, and both appeared unremarkable.

Due to the increase in prostate size, the dog was sent home with a medical treatment consisting of 15 mg oral OSA once daily for seven days in order to correct the benign prostatic hyperplasia.

One week from discharge from the hospital (one day after the last OSA administration), the dog continued to show some signs of tenesmus even if defecation was done normally. For this reason, an abdominal ultrasonography control was performed in order to assess intestinal content and prostatic status. On ultrasonography, normal intestinal content was visualised, disappearance of prostatic cysts was confirmed, and prostate size was reduced to 33.94 cm^3. At that moment, the owner was advised of the length of efficacy of OSA (± 6 months) and that an ultrasonographic control of the prostate 180 days post-treatment should be performed to determine the restoration of prostatic size.

Another two ultrasonographic checks of the prostate were performed 60 and 180 days after discharge from the hospital. At 60 days, on physical examination the dog's clinical parameters were normal, no signs of tenesmus were present and prostate size was markedly reduced to 21.29 cm^3. When the dog was rechecked at 180 days, prostate size seemed to have slightly increased from the last control showing a volume of 24.97 cm^3. At the end of treatment, the owner was advised to repeat the OSA treatment to avoid the increase of prostate size.

DISCUSSION

BPH is very common in dogs older than 6 years, even if many dogs remain clinically healthy. For this reason, BPH should always be considered as a pathologic condition in a differential diagnosis in non-castrated male dogs older than 6 years (Smith, 2008; Nizanski et al., 2014). Due to the nonspecific clinical signs of this condition, an accurate diagnosis can be difficult. History, physical examination, laboratory findings, rectal palpation, radiography and ultrasonography are very useful in the diagnosis of prostatic conditions while prostatic biopsy, even if it permits a definitive diagnosis, is not recommended if infectious or neoplastic prostatic conditions have not been excluded first.

In this dog, blood dripping from the tip of the penis, characteristic of males suffering from BPH, was not observed. Nonetheless, the diagnosis of a prostatic disorder was not ruled out immediately, although a foreign body in the digestive tract was the first suspect. When a lateral radiograph was performed, a dorsal compression of the descending colon was observed due to prostatic enlargement, impeding the transit of faecal material and evolving to a severe form of faecaloma.

Even though the causes of faecaloma in the dog have not been well described, visceral myopathy has been proposed to be a major factor (Eastwood et al., 2005; Westgarth et al., 2013). In this case, dorsal compression of the colon caused

by the increased prostatic size observed by radiography may have had some effect on colonic motility, thus contributing to the formation and evolution of the faecaloma. The dog's intact or castrated status should always be considered when dealing with prostatic conditions. While BPH is a very common pathology in intact dogs, prostatic carcinoma is almost exclusively, though infrequently, found in castrated dogs (Feeney et al., 1984). Thus, in cases of intestinal obstruction in castrated male dogs due to prostatic enlargement, a prostatic carcinoma should also be considered (Leroy et al., 2013).

Signs of colonic impaction and faecaloma may be unspecific and vary from vomiting to anorexia, abdominal pain and diarrhoea. In addition, colonic impaction may be subclinical and the condition can progress gradually for periods over 6 months (Wells et al., 1995; White, 1997; Eastwood et al., 2005; Westgarth et al., 2013; Kim et al., 2018). In severe cases, perforation of the colon and faecal peritonitis may occur, leading to a fatal condition. For this reason, in addition to the resolution of faecaloma, the underlying cause of the disease has to be well evaluated and resolved as well.

In the present case, BPH seemed to be the underlying cause of colonic impaction and the formation of faecaloma. Usually, the prostate gland is not easy to see on radiographs, but when its diameter is greater than 70% of the pubic–sacral promontory distance, its visualisation is much easier, and in such cases, the prostate is considered to be hyperplastic (Feeney et al., 1987). Some authors have described that the prostate volume in beagles (7–13 kg) affected with BPH ranged from 5 to 31 cm^3, depending on whether the size was measured by ultrasonography or MRI (Wheaton et al., 1979; Laroque et al., 1994; Cohen et al., 1995; Iguer-Ouanda and Verstegen, 1997). In the present case, by ultrasonographic measurement, the prostate appeared to have an initial size of 48.29 cm^3. In cases of prostatic enlargement, considering the size of the dog, serum CPSE is very representative when used to diagnose BPH, as observed in this dog. Previous studies have reported that the threshold of serum CPSE in prostatic abnormalities is 50 ng/mL and 90 ng/mL, diagnostic of disease with a prostate volume 1.5 and 2.5 times of the normal volume, respectively (Holst et al., 2017; Alonge et al., 2018). Thus, in order to avoid prostatic problems, a preventive prostatic ultrasonography performed at 40% of the dog's expected lifespan is recommended (Mantziaras et al., 2017).

In symptomatic situations, castration is considered to be the treatment of choice in order to decrease testosterone to basal levels and, in consequence, to reduce prostate size (Cunto et al., 2019). Despite the recommendation, the owner refused surgical treatment and asked for a medical treatment. To date, OSA is the latest product developed for the treatment of canine BPH, showing an antagonist effect on androgen receptors at the prostate level that lasts for approximately 6 months (Tsutsui et al., 2000, 2001). Other compounds, such as deslorelin acetate implants, have also been shown to reduce testosterone levels and prostate size; nevertheless, the use of deslorelin implants causes a flare-up effect with an increased secretion of testosterone that lasts approximately one to two weeks and is not advised in cases of symptomatic BPH (Trigg et al., 2001). With this in mind, a dose of 15 mg (0.25–0.5 mg/kg) of OSA (Ypozane, Virbac) once daily for seven days was prescribed and routine controls were fixed in order to check prostate size reduction and the length of treatment efficacy. When an ultrasonographic control was performed 60 days after the beginning of treatment, the prostate showed to be reduced to 66% of its initial size, and with a significant reduction at the end of the treatment as described previously (Tsutsui et al., 2001).

In conclusion, prostate enlargement should always be considered in male dogs suffering from colonic impaction. On the other hand, colonic impaction should be the first problem to treat before trying to reduce prostate size in order to avoid a fatal evolution of the condition. Once resolved, both surgical and medical treatment (in cases of poor surgical candidates) using a testosterone-blocker compound should be considered for prostate size reduction.

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