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Case report

CYSTIC BENIGN PROSTATIC HYPERPLASIA IN A DOG

W.X. Tan[1], K.H. Khor[1*] and S.M. Chan[2]

[1]*Faculty of Veterinary Medicine, Universiti Putra Malaysia, UPM Serdang, Selangor, Malaysia*
[2]*University Veterinary Hospital, Faculty of Veterinary Medicine, Universiti Putra Malaysia, UPM Serdang, Selangor, Malaysia*

SUMMARY

Old intact male dogs are often predisposed to benign prostatic hyperplasia. Both hypertrophy and hyperplasia of prostate gland occur due to hormonal influences. Clinical signs such as haematuria, stranguria and tenesmus are often associated with benign prostatic hyperplasia. A seven year-old local breed intact male dog was presented with a primary complaint of haematuria and stranguria. Diagnostic work-up conducted inclusive of complete blood count, serum biochemistry, urinalysis, abdominal radiograph, cystourethrography and abdominal ultrasonography. The dog was diagnosed with cystic benign prostatic hyperplasia. Prostatic omentalisation and castration were performed in this case.

***Keywords**: Benign prostatic hyperplasia, haematuria, stranguria, tenesmus, cyst, omentalisation*

INTRODUCTION

Canine prostate gland is an androgen-dependent, ovoid in shape, and bi-lobed gland that encircles the urethra in a male dog (Johnston *et al*., 2000). It is the only accessory sex gland in a male dog, located caudal to the neck of urinary bladder in retroperitoneal cavity.

Benign prostatic hyperplasia is a common age-related disorder in intact male dogs. More than 80% of male dogs over the age of five year-old are affected with this disorder (Johnston *et al*., 2000). Alteration of the androgen to oestrogen ratio in intact male dogs will result in hyperplasia and hypertrophy of prostate cells, leading to development of benign prostatic hyperplasia (Smith, 2008). Clinical signs associated with benign prostatic hyperplasia are haematuria, stranguria, urethral discharge and tenesmus (Johnston *et al*., 2000).

Prostatic disorders in dogs may be treated with medical therapy, surgery, or a combination of both. This article focuses on prostatic disorders that are treated surgically and prostatic surgical procedures.

CASE REPORT

A seven year-old intact male local dog was presented with the primary complaint of chronic haematuria and stranguria. The dog was managed indoor with updated vaccination and deworming program. The dog was previously diagnosed with kidney disease approximately nine months ago by a private veterinarian. Clinical signs of haematuria and stranguria resolved after a long-term treatment of Rowatinex® (ROWA Pharmaceuticals Ltd., Ireland) which consists of essential oil. However, haematuria recurred six months after the medication was stopped. The persistent recurrent clinical sign of haematuria prompted the owner to present the dog to University Veterinary Hospital, University Putra Malaysia (UVH-UPM) for second opinion.

All the vital signs including temperature, pulse, and respiration were within the normal range. The dog had a pink mucous membrane with capillary refill time of less than 2 seconds. There were bilateral submandibular lymph nodes slightly enlargement upon palpation. Trans-rectal palpation performed revealed an enlarged symmetry bump ventral to the rectum at the pelvic region. The differential diagnoses were benign prostatic hyperplasia, prostatic cyst, cystitis, cystolithiasis, urolithiasis and urinary bladder neoplasia.

Blood obtained for a complete blood count revealed non-significant finding as all the parameters were within the normal range. Blood for serum biochemistry revealed slightly increased in calcium (2.94 mmol/L; normal range: 2.0 to 2.8 mmol/L) and total protein (77.7 g/L; normal range: 55 to 75 g/L) level. Urine sample collected via spontaneous micturition method revealed hyperstenuric with the specific gravity (S.G.) of 1.050 (normal range: > 1.030), suggestive highly concentrated urine. Microscopic evaluation of the urine sample had shown an evidence of red blood cells in the urine with five to ten erythrocytes per high power field. Other than that, the dog had slight proteinuria (Protein: 2+), bilirubinuria (Bilirubin: 2+), and increased turbidity (Turbidity: 2+) due to the presence of cells, casts, and crystals in the urine. Therefore the diagnosis of chronic kidney disease in this dog was not likely.

Abdominal radiograph revealed that there were two oval radiopaque structures on caudal region of the abdominal cavity (Figure 1). The spleen was noted to be enlarged suggestive of splenomegaly. Further diagnosis workout of splenomegaly was not looked into in this case. These radiopaque structures were suspected to be the urinary bladder and the prostate gland. Cystourethrography was performed to differentiate the two radiopaque structures. The urinary bladder (red arrow) was filled with the contrast medium and appeared radiopaque in the cystourethrogram (Figure 2) with no filling defect. The other oval structure caudal to the urinary bladder was identified as the prostate gland (blue arrow). Urolith and cystolith were not noticed in the lower

**Corresponding author: Dr. Khor Kuan Hua (K.H.Khor);*
Phone: 03-8609 3926; Email:khkhor@upm.edu.my

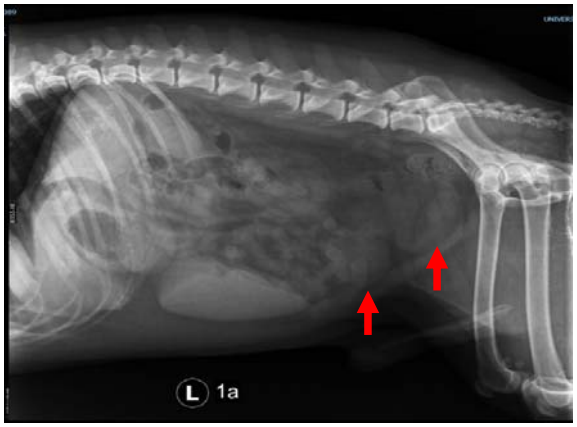

Figure 1. Left lateral view of abdominal radiograph revealed two oval radiopaque structures on caudal region of the abdominal cavity (arrow).

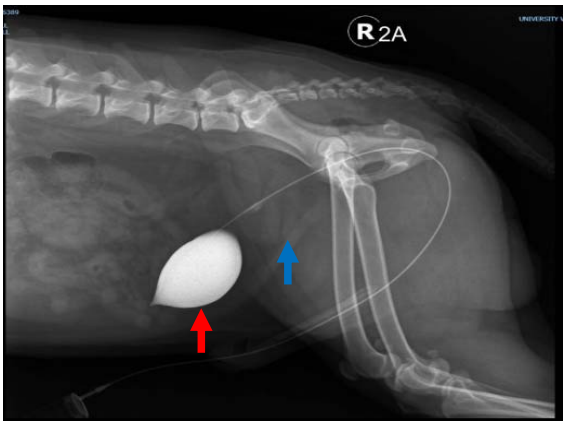

Figure 2. Cystourethrogram of urinary was performed. The left arrow (red) indicate the bladder and the right arrow (blue) revealed an oval radiopaque structures at the caudal region of the abdominal cavity suspicious of prostate.

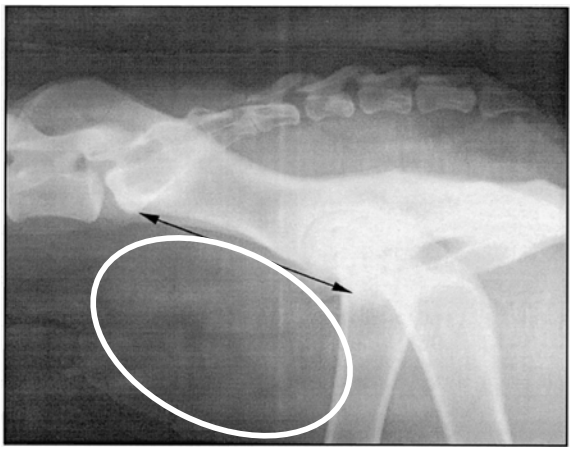

Figure 3. The two-headed arrow shows the pubic-sacral promontory distance in a lateral radiographic view. The enlarged radiopaque structure (in white circle) suspected likely to be the enlarged prostate which occupied more than 70% of the pubic-sacral promontory distance.

urinary tract. Thus, cystolithiasis and urolithiasis were ruled out in this case.

The prostate gland on the lateral radiographic view was considered enlarged as the prostatic diameter was greater than 70% of the pubic-sacral promontory distance (Figure 3) (Johnston *et al*., 2000).

Abdominal ultrasonography was performed further evaluate the urinary bladder and the prostate. Findings revealed a normal sized of 2cm x 4cm urinary bladder with a smooth bladder wall and no sediment. Hence, urinary bladder neoplasia was unlikely. A hypoechoic structure measured 3cm x 4cm in size was noticed on the right lobe of prostate gland, which was suggestive of a cyst. An ultrasound-guided fine needle aspiration of the suspected prostate cyst was conducted and approximately 4 ml of pale yellow fluid was aspirated. Cytology examination of the fluid showed clusters of uniform and well-differentiated epithelial cells which was suggestive of hyperplasia (Figure 4).

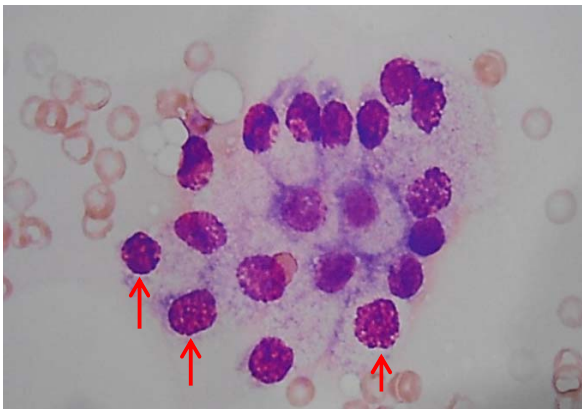

Figure 4. Cytology findings of uniform and well-differentiated epithelial cells (arrow) which was suggestive of hyperplasia from fluid aspirated by ultrasound-guided fine needle aspiration.

Combination of all the findings from physical examination, urinalysis, abdominal radiography, abdominal ultrasound and fluid cytology, the dog was diagnosed with cystic benign prostatic hyperplasia. Surgical intervention was opted. Prostatic omentalisation and castration were performed for this case. Prostatic omentalisation was opted to prevent further cavitary lesion such as cyst in this case.

Upon hospitalisation, the dog was medicated with serratiopeptidase (Danzen, Takeda, Japan) as an anti-inflammatory and 5 mg/kg enrofloxacin (Batyril®, Bayer, USA) as prophylactic antibiotic therapy. Vitamin B complex was administered orally as appetite stimulant. 3mg/kg of tramadol hydrochloride (Acugesic, CCM Duopharma BioTech, Malaysia) was administered intravenously as an analgesic after the surgery. Condition of the dog improved on the first day post-surgery where haematuria was no longer observed. Other clinical signs such as stranguria and tenesmus were no longer present and the dog did not show any abdominal discomfort upon palpation.

DISCUSSION

The common clinical signs observed in dogs with benign prostatic hyperplasia are dripping of prostatic sanguineous fluid from the penile tip, haematuria, stranguria and constipation (Johnston *et al*., 2000). Haemospermia and tenesmus may also be seen in some dogs with benign prostatic hyperplasia (Johnston *et al*., 2000). The other prostatic disease that need to be differentiate from benign prostatic hyperplasia are prostatitis, prostatic abscesses, prostatic cysts, and prostatic neoplasia, where are uncommonly presented in dogs (Smith, 2008).

Pathophysiology of benign prostatic hyperplasia is not fully known, and it has been speculated to be due to increase in responsiveness of the prostate gland toward testosterone and/or affected by the altered androgen:oestrogen ratio secreted by testes (Leib and Monroe, 1997). Testosterone serves as prohormone for dihydrotestosterone. Increased dihydrotestosterone level will result in symmetric, progressive, eccentric, and prostatic parenchymal hyperplasia (Davidson, 2014). Apart from dihydrotestosterone, benign prostatic hyperplasia is also facilitated by oestrogen. Oestrogen will enhance androgen receptors in the gland, predisposing the gland to higher risk of undergoing hyperplasia (Leib and Monroe, 1997).

Cyst formation may occur if there is an obstruction of the prostatic canaliculi resulting in accumulation of prostatic fluid. There are two types of prostatic cyst, which are prostatic retention cyst and paraprostatic cyst. These two types of cysts can be differentiated by comparing the location and structural communication with the prostatic urethral. Prostatic retention cyst is usually located within the prostatic parenchymal with cavitating lesion filled with fluid (Smith, 2008) and often there will be communication between the cysts with prostatic urethra (White, 2000). Paraprostatic cyst is usually located outside the gland and has minimal communication with the prostatic urethra (White, 2000) which occurred in this case.

There are a few treatment options available for benign prostatic hyperplasia, both medically and surgically. However, prostatic diseases commonly warrant surgical intervention. Early castration may prevent the development of benign prostatic hyperplasia, prostatitis, and cavitary lesions (prostatic abscesses or cysts). In intact dogs that present with these disorders, castration is commonly recommended as treatment or as a prevention measure for the occurrences of this disease especially in old dogs. Castration should always be part of the specific surgical treatment because it enhances treatment success and may prevent recurrence. Castration will remove the influence of hormones on the prostate gland, resulting in up to 70% reduction in size of the gland in a dog with benign prostatic hyperplasia (Smith, 2008). The current treatment of choice for cavitary lesions is prostatic omentalisation, which results in lower postoperative mortality, faster recovery, and fewer incidences of recurrence than other prostatic drainage techniques. Prostatic omentalisation can be performed as surgical treatment to place the omentum on the prostatic lesion. Function of omentum is to promote angiogenesis, enhance lymphatic drainage, phagocytic functions, and promote localised adhesion (White, 2000). Prostatic omentalisation is categorised into intracapsular or extracapsular (Freitag *et al*., 2007). Omentum is placed into the prostate along or surrounding the prostatic urethra in intracapsular prostatic omentalisation. On the other hand, omentum is packed loosely into the cyst cavity and sutured to the cyst remnant for extracapsular prostatic omentalisation (Freitag *et al.,* 2007).

Surgical intervention is often not a favourable option among dog breeders. In such cases, administration of finasteride would be a better medical treatment option. Finasteride is a synthetic steroid that blocks the pathway which converts testosterone to dihydrotestosterone (Leib and Monroe, 1997). Therefore, it inhibits the production of dihydrotestosterone and preventsprostatic gland hyperplasia. Although the drug may cause reduction in the semen volume, the quality and quantity of the semen are not affected (Smith, 2008). Another option of therapeutic drug is an anti-oestrogenic compound known as tamoxifen. Tamoxifen has a mixed antagonist-agonist effect and works by blocking the oestrogen receptors in the gland (Smith, 2008). This drug has been shown effectively reducing the size of prostate gland and testosterone concentration in the dogs without any side effects (Smith, 2008). However, Tamoxifen is not available in Malaysia.

Surgical intervention of castration and omentalization was chosen in this case as it provides the best chances of recovery and prevent the risk of disease reoccurrence. In addition, total excision paraprostatic cyst was recommended as persisting cyst may cause physical displacement of abdominal viscera (Johnston *et al*., 2000). Apart from unavailability of Tamoxifen in Malaysia, finasteride would require a treatment period of 16 weeks to reduce the prostate size while diethystilbestrol and medroxyprogesterone acetate were reported of causing adverse effects such as bone marrow

suppression, pancytopenia, squamous metaplasia of the prostate, and development of diabetes mellitus and mammary nodules (Johnston *et al*., 2000).

CONCLUSION

Benign prostatic hyperplasia is a common disorder in old intact male dogs. In some cases, prostatic cysts may develop due to canaliculi obstruction leading to cystic benign prostatic hyperplasia. As prevention or treatment, owners should consider castrating their dogs in order to remove the hormones influence on the prostate gland. Alternative, finasteride is a good option to be considered when surgical intervention is not an option.

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CONFLICT OF INTEREST

No conflict of interest.

REFERENCES

Bray J., White, R. and Williams, J. (1997). Partial resection and omentalisation: a new technique for management of prostatic retention cysts in dogs. Veterinary Surgery, 26(3), pp.202--209.

Davidson, A. (2013). Prostatic Disease. http://www.cliniciansbrief.com/article/prostatic-disease (accessed 5 January 2015).

Freitag, T., Jerram, R. M., Walker, A. M., and Warman, C. G. a. (2007). Surgical management of common canine prostatic conditions. Compendium (Yardley, PA), 29(11), 656–8, 660, 662–3 passim; quiz 673. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/18210976

Johnston, S., Kamolpatana, K., Root-Kustritz, M. and Johnston, G. (2000). Prostatic disorders in the dog. Animal reproduction science, 60, pp.405--415.

Leib, M. and Monroe, W. (1997). Practical Small Animal Internal Medicine. 1st ed. Saunders, pp.367-382.

Smith, J. (2008). Canine prostatic disease: a review of anatomy, pathology, diagnosis, and treatment. Theriogenology, 70(3), pp.375--383.

White, R. (2000). Prostatic surgery in the dog. Clinical techniques in small animal practice, 15(1), pp.46--51.