International Journal of Livestock Research, Vol. 10 (8) Aug' 2020
http://www.ijlr.org
eISSN: 2277-1964
NAAS Rating 2020 – 5.36

Case Report

Clinico-Pathological Study of Chronic Nephropathy Associated with Prostatic Hyperplasia in a Dog

Anmol Bisht, Rakesh Kumar*, Abhishek Kumar, R. D. Patil, R. K. Asrani and V. K. Gupta

Department of Veterinary Pathology, DGCN COVAS, CSKHP KV, Palampur, Himachal Pradesh, INDIA

*Corresponding Author: rkvetpath@gmail.com

How to cite this paper: Bisht, A., Kumar, R., Kumar, A., Asrani, R., & Gupta, V. (2020). Clinico-Pathological Study of Chronic Nephropathy Associated with Prostatic Hyperplasia in a Dog. *International Journal of Livestock Research*, 10(8), 205-208. doi: http://dx.doi.org/10.5455/ijlr.20200422115016

Received : Apr 22, 2020
Accepted : Jun 30, 2020
Published : Aug 31, 2020

Abstract

A carcass of an adult male German Shepherd dog was brought for the post-mortem examination with the history of inappetance, straining while defecating, elevated levels of creatinine (8.2 mg%) and BUN (211.5 mg%), presence of organized sediments including transitional and renal epithelial cells, fatty casts, crystals on cytology and enlarged prostate gland on radiological examination. Detailed necropsy examination revealed pale and granular kidneys with diffusely adherent renal capsule. The prostate gland was enlarged with multiple cystic areas. The heart and liver showed flaccid and passive venous congestion, respectively. Microscopically, kidneys revealed the presence of degenerative changes in association with deposition of eosinophilic proteinaceous material in the tubular lumina along with mineralization. Prostate gland revealed the presence of pleomorphic pattern of myofibrils along with the deposition of variable amount of fibrous collagenous tissue. Based on above findings, it was diagnosed as a case of chronic nephropathy associated with prostatic hyperplasia.

Keywords: Dog, Kidneys, Prostate, Urinalysis and Renal Disease

Introduction

Renal insufficiency is commonly encountered clinical condition of geriatric dogs (Beddhu *et al*., 2020). The associated factors contributing for the development of renal health issues often includes infectious, immune-mediated, congenital, metabolic, neoplastic, traumatic, nephrotoxic chemicals and obstructive diseases processes. The animals showing prostate enlargement and not castrated are more susceptible for the development of chronic renal diseases (Wilson, 2011; Smith, 2008). Prostate enlargement is one of the most important factor leading to the obstruction of urinary bladder outlet and thereby resulting to kidney problems (Kustritz and Klausner, 2000; Emberton *et al.*, 2003).

A German shepherd adult male dog was presented with the history of in-appetence, tartar accumulation and straining while defecating, since 5 days to clinical facility of the college of Veterinary and Animal Sciences, Palampur. Urine analysis revealed the presence of pus cells (8-10/hpf), transitional epithelial cells, renal epithelial cells, fatty casts, erythrocytes and crystals especially oxalates (Fig. 1). Radiological evaluation revealed the presence of enlarged prostate gland in association with echogenic stone like deposits in kidneys and urinary bladder. Blood serum examination showed alteration in the levels of creatinine (8.2 mg %) and BUN (211.5 mg %). The clinic-pathological reports were suggestive of renal impairment and renal disorders. These reports showed parallel correlation with some of the studies conducted on chronic renal diseases (Pandya *et al*., 2016).

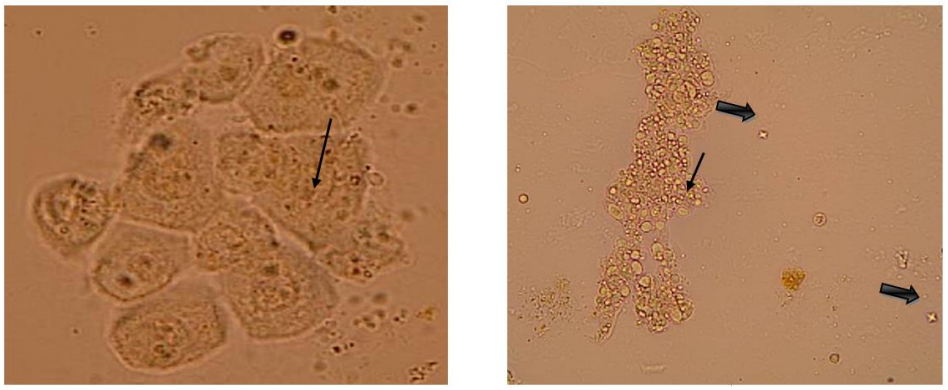

Figure 1: a. Multilayered transitional epithelial cells (direct smear, arrow); **b.** Refractive fatty casts (thin arrow) along with octahedral shaped oxalate crystals (direct smear, thick arrows)

The dog did not respond to the treatment and died. Necropsy examination was conducted in the Department of Veterinary Pathology, DGCN COVAS, CSKHP KV, Palampur. A thorough post-mortem evaluation depicted enlarged, pale kidneys with granular surface. The capsule of the kidneys was completely adherent with renal parenchyma indicating chronic nephritis (Kolbjørnsen *et al*., 2008). The cut section of both the kidneys revealed the presence of creamish white coloured deposits at the junction of medulla and pelvis (Fig. 2) as well as in the lumen of the urinary bladder.

Figure 2: Pale appearance of kidney along with multifocal, variable sized, hard, creamish-yellow coloured, gritty or chalky deposits at medullary-pelvic junction (arrows)

The prostate gland was severely enlarged (at least 3 times) to its original size and found to contain multiple clear fluid containing cystic cavities (Fig. 3). The liver showed rounded borders and oozing of blood on cutting indicating sinusoidal engorgement. The heart was flaccid in appearance with gelatinized epicardial fats. Representative 0.5 cm thick tissue sections of kidneys, prostate gland, liver and heart were collected and fixed in 10% neutral buffered formalin solution for histopathological evaluation. After fixation the tissues were processed, embedded in molten paraffin, sectioned (4-6 micron) and stained with Haematoxylin & Eosin (H&E) as per the standard protocol (Luna, 1968).

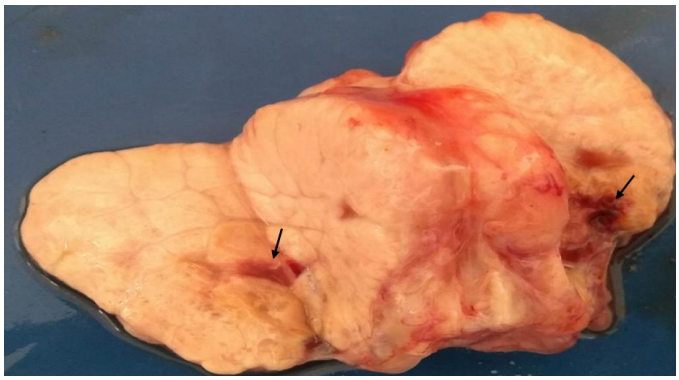

Figure 3: Prostate gland showing enlargement along with fluid filled cystic structures (arrows)

Histopathological evaluation of kidneys revealed the presence of swollen tubular epithelial cells along with extensive degenerative changes. At places eosinophilic necrotic tubular cells were also evident along with sloughing of cellular or granular casts in tubular lumina. Kidneys also depicted the presence of proteinaceous material filled in the tubular lumina (Fig. 4). H&E stained sections of prostate gland showed pleomorphic nuclear identities, deposition of variable amount of fibrous connective tissue and haphazardous pattern of muscles (Fig. 5).

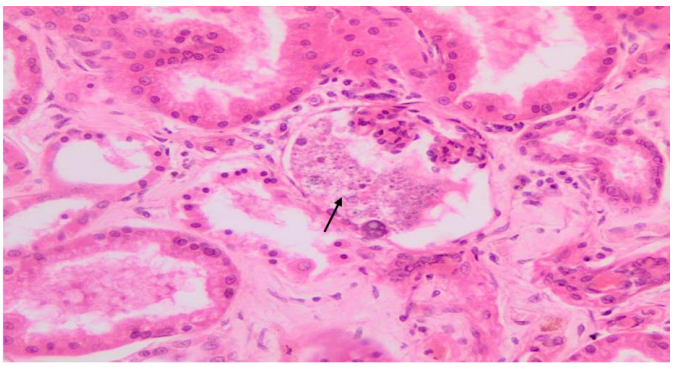

Figure 4: Microscopic examination of kidney section reflecting dilated renal tubules containing eosinophilic casts, vacuolated glomerulus in association with severe degenerative changes, areas of urolith formation and fibrous tissue proliferation. H&Ex200

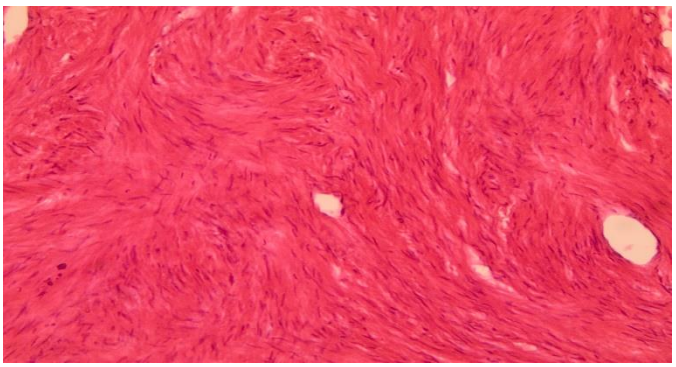

Figure 5: Microscopic evaluation of prostate gland section revealing haphazardous pattern of muscle fibers along with pleomorphic nuclear identities and deposition of variable amount of fibrous connective tissue. H&Ex100

The clinical and pathological findings including tartar accumulation, elevated values of BUN and creatinine, presence of urinary casts and crystals on urinalysis and gross examination along with microscopic evaluation all together concluded this case to be chronic nephropathy attributed to the prostate gland enlargement (Kustritz and Klausner, 2000; Barbudo-Selmi *et al*., 2004).The present study concluded the renal failure attributed to the uremic condition associated with cardiomyopathy or encephalopathy in the affected dog (Mahoney and Arieff, 1982; Ronco *et al*., 2009).

Acknowledgements

The facilities provided by CSKHPKV authorities in carrying out the present study are thankfully acknowledged.

Conflict of Interests

There is no conflict of interest.

Publisher Disclaimer

IJLR remains neutral concerning jurisdictional claims in published institutional affiliation.

References

1. Barbudo-Selmi, GR., Carvalho, MB., Selmi, AL. and Martins, SEC. (2004). Periodontal disease characterization in dogs with normal renal function or chronic renal failure. *Ciencia rural. 34(1).* https://doi.org/10.1590/S0103-84782004000100017
2. Beddhu, S., Baird, B., Zitterkoph, J., Neilson, J. and Greene, T. (2009). Physical activity and mortality in chronic kidney disease (NHANES III). *Clinical Journal of the American Society of Nephrology*. 4(12): 1901–1906
3. Emberton, MGL., Andriole, J., de la Rosette, J., Djavan, B., Hoefner, K., Vela Navarrete, R., Nordling, J., Roehrborn, C., Schulman, C., Teillac, P., Tubaro, A., Nickel, JC. (2003). Benign prostatic hyperplasia: A progressive disease of aging men. *Urology*. 61: 267-273.
4. Kolbjørnsen, Ø., Heggelund, M. and Jansen, JH. (2008). End-Stage Kidney Disease Probably due to Reflux Nephropathy with Segmental Hypoplasia (Ask-Upmark Kidney) in Young Boxer Dogs in Norway. A Retrospective Study. *Veterinary Pathology*. 45(4): 467–474.
5. Kustritz, MVR and Klausner, J.S. (2000). Prostatic diseases. In: Textbook of Veterinary Internal Medicine (Ed. Ettinger SJ) 5th edn. WB Saunders, Philadelphia. pp. 1687–1698.
6. Luna, G. (1968). Manual of histologic staining methods of the Armed Forces Institute of Pathology. New York: Blakiston Division, McGraw-Hill.
7. Mahoney, CA and Arieff, AI. (1982). Uremic Encephalopathies: Clinical, Biochemical, and Experimental Features. *American Journal of Kidney Diseases*. 2(3): 324–336. doi:10.1016/s0272-6386(82)80090-5.
8. Pandya, D., Nagrajappa, AK. and Ravi, KS. (2016). Assessment and Correlation of Urea and Creatinine Levels in Saliva and Serum of Patients with Chronic Kidney Disease, Diabetes and Hypertension- A Research Study. *Journal of clinical and diagnostic research*. 10(10): 58–62. doi:10.7860/JCDR/2016/20294.8651.
9. Ronco, C., McCullough, P., Anker, SD., Anand, I., Aspromonte, N. and Bagshaw, S.M. (2009). Cardio-renal syndromes: report from the consensus conference of the Acute Dialysis Quality Initiative. *European Heart Journal*. 31(6): 703–711. doi:10.1093/eurheartj/ehp507.
10. Smith, J. (2008). Canine prostatic disease: A review of anatomy, pathology, diagnosis, and treatment. *Theriogenology*. 70(3): 375-383. doi: 10.1016/j.theriogenology.2008.04.039
11. Wilson, JD. (2011). The critical role of androgens in prostate development. *Endocrinology & Metabolism Clinics of North America*. 40: 577–590.

****