Indian J. Vet. Med. Vol. 45, No. 2, 2025 pp. 46-47

Urolithiasis in a Dog with Diabetes Mellitus - A Case Report

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Abstract

A 7-year-old female Beagle, diagnosed with diabetes mellitus six months earlier and on insulin therapy, presented with haematuria, dysuria, and abdominal discomfort. Diagnostic workup included complete blood count, blood smear, mean blood glucose estimation, serum amylase and lipase, rapid Snap 4DX test, Babesia spp. antigen tests, radiography, and ultrasonography. All infectious disease tests *(E. canis, Anaplasma spp., Dirofilaria immitis, Borrelia burgdorferi, Babesia canis, B. gibsoni)* were negative. Complete blood count showed a platelet count of 399,000/µL. Random blood glucose was 600 mg/dL, reduced to 224 mg/dL post-insulin. Imaging revealed a 3.52 cm hyperechoic, radio-opaque structure in the lower abdomen, consistent with cystic calculi, along with a thickened urinary bladder wall (0.61 cm), suggestive of cystitis likely associated with diabetes and uroliths. Surgery was performed, and a 24.42 g, yellowish, apricot seed-shaped calculus (3.1 × 2.4 × 1.3 cm) was removed.

Keywords: Cystitis, Diabetes mellitus,Dog, Hematuria, Urolithiasis

Introduction

Diabetes mellitus is one of the most common endocrinopathies observed in middle-aged to older dogs, primarily characterized by hyperglycemia, glycosuria, and weight loss due to an absolute or relative deficiency of insulin (Audrey, 2012). Diabetic animals are more prone to bacterial and fungal infections and are predisposed to chronic or recurrent infections such as cystitis, prostatitis, bronchopneumonia and dermatitis. The present article describes cystic calculi in a dog with diabetes mellitus.

Case History and Observations

A 7-year-old female Beagle was presented to the Veterinary Clinical Complex, Bihar Veterinary College, Patna, with a primary complaint of haematuria. The animal had been diagnosed with diabetes mellitus six months earlier and was receiving insulin therapy. The owner reported associated signs including polyuria, polydipsia, lethargy, reduced appetite, and bilateral cataract formation. On clinical examination revealed severe haematuria. A complete blood count (CBC) performed using an automated hematology analyzer (Nihon Kohden) revealed hemoglobin 10.7 g/dL, RBC 4.98 × 10^6/µL, hematocrit 33.5%, MCV 67.3 fL, MCH 21.5 pg, MCHC 31.9 g/dL, WBC 82 × 10^3/µL (neutrophils 79.8%, lymphocytes 16%, monocytes 3.8%, eosinophils 0.3%), and platelet count 3.99 × 10^5/µL. Serum biochemical analysis using a dry chemistry analyzer (Fuji DRI-CHEM NX600V) indicated marked hyperglycemia (600 mg/dL), elevated blood urea nitrogen (48 mg/dL), serum creatinine (2.1 mg/dL), alanine aminotransferase (100 IU/L), amylase (623 IU/L), and lipase (392 IU/L). Rapid lateral flow assays (SNAP 4Dx Plus and Babesia Rapid Test Kits) and Giemsa-stained blood smear examination were negative for *Ehrlichia canis*, *Anaplasma* spp., *Dirofilaria immitis*, *Borrelia burgdorferi*, *Babesia canis*, and *Babesia gibsoni*. Abdominal ultrasonography revealed a hyperechoic mass with acoustic shadowing within the urinary bladder. Radiographic examination confirmed the presence of radio-opaque calculi within the urinary bladder. Although the urolith was surgically removed, the dog, which was also diagnosed with diabetes mellitus, later developed severe epilepsy before death.

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https://doi.org/10.56093/ijvm.v45i2.170512

Fig. 1: Ultrasound examination of urinary bladder showed hyperchoic mass with acoustic shadowing

Fig 2: Surgical removal of cystolith of yellowish, apricot seed-shaped, measuring 3.1 x 2.4 x 1.3 cm.

Treatment and Discussion

Immediate intervention was initiated to manage the uncontrolled hyperglycemia, including administration of isophane insulin at a dose of 1 U/kg body weight twice daily via subcutaneous injection, along with a prescription of a commercial diabetic diet. Subsequent biochemical analysis revealed an improvement in blood glucose levels, reducing to 220 mg/dL. Surgical intervention was performed to remove the urolith, which was identified as a 24.42 g, yellowish, apricot seed-shaped calculus, measuring 3.1 x 2.4 x 1.3 cm (Fig 2). Post-operatively, the patient received antibiotics (amoxicillin clavunate @10mg/kg IV), fluid therapy (Ringers lactate@ 10mg/kg IV) and isophane insulin (0.5 U/kg body weight, subcutaneously twice daily). In this case, clinical signs of haematuria, dysuria, and abdominal discomfort were attributable to irritation of the bladder mucosa and partial obstruction of the urinary bladder by the calculus, as previously described by Fromsa and Saini (2019). The slight reduction in hemoglobin and erythrocyte count observed may have been due to blood loss associated with hematuria (Tion *et al*., 2015). Biochemical alterations, including elevated blood urea nitrogen and creatinine, indicated compromised renal function, likely associated with post-renal azotemia caused by partial urinary tract obstruction (Vijayakumar *et al*., 1999). The persistently high blood glucose concentration confirmed inadequate glycemic regulation. In this case, ultrasonography demonstrated a large hyperechoic structure within the urinary bladder, consistent with reports by Fromsa and Saini (2019). The coexistence of diabetes mellitus and urolithiasis in this dog aligns with the findings of Mircean *et al.* (2006), who reported a predisposition to urinary tract disorders in diabetic dogs due to altered urine composition and increased susceptibility to infection. In conclusion, this case highlights the complex interplay between diabetes mellitus, urolithiasis, and cystitis in dogs, where persistent hyperglycemia predisposes to urinary tract complications and infection.

References

Audrey, K. C. 2012. Monitoring Methods for Dogs and Cats with Diabetes Mellitus. *J. Diabetes Sci Technol,* **6 (3)**:491-495.

Fromsa, A. and Saini, N.S. 2019. Canine Urolithiasis and Concurrent Urinary Bladder Abnormalities: Symptoms, Haematology, Urinalysis and Comparative Radiographic and Ultrasonographic Diagnosis. *Vet. Med. Open J.*, **4**: 18–26.

Mircean, M., Giurgiu, G., Mircean, V., and Katsaros, K. 2006. Epidemiologic, clinic and ethiopathogenic studies in canine urolithiasis. *Bulletin - University of Agri. Sci. Vet. Med.,* **63**: 337-342.

Tion, M. T., Dvorska, J., and Saganuwan, S. A. 2015**.** A Review on urolithiasis in dogs and cats. *Bulgarian J. Vet. Med.,* **18**:1–18.

Vijayakumar, G., Nambi, A. P, Vasu, K., and Dhanapalan, P. 1999. Ultrasonographic Diagnosis of Cystic Calculi in a Dog-A Case Report. *Indian Vet. J*., **5**: 438–439.

Received : 20.08.2025 **Accepted : 09.12.2025** **Published : 15.12.2025**