

# Successful Management of Cystitis in a Male Dog

## ABSTRACT

A 5-year-old male mixed breed dog was brought with complaints of fever, vomiting, Inappetence, hematuria for 1 week, dysuria, pollakiuria, pain during urination and pain on palpation in the caudal part of abdomen. Haemato-biochemical analysis showed Hemoglobin 9.1 gm/dL, RBC 4.4 million/ $\mu$ L, WBC  $24.75 \times 10^3$  / $\mu$ L, and Neutrophil 85%. Urine culture revealed *Staphylococci*. In USG, urinary bladder wall was markedly thickened and bladder endothelium lining was highly uneven. In urinalysis report, sanguineous colour of urine with pH 7.8 and red blood cell (10 cells/HPF) were there. The management of cystitis was done with fluid therapy, broad-spectrum antibiotic, and supportive therapy for a duration one week. The condition of the dog improved and medicines were continued orally for another 2 weeks.

**Keywords:**Antibiotic,Cystitis, Dog, USG

## 1. INTRODUCTION

Cystitis refers to the inflammation of urinary bladder. Clinically it is characterized by pollakiuria, dysuria, presence of inflammatory cells, bacteria in urine and hematuria. It occurs in all animals; but the prevalence is higher in dogs and cats. Compared to males it is more common in females due to trauma, tumor or infection. Allergic and emphysematous cystitis have also been reported. Hematuria may be more apparent at the end of the urination. Palpating the caudal abdomen of an animal may feel pain, and the bladder may feel thickened or irregular. Infection is mostly ascending type but descending infection may occur from embolic nephritis. Bacterial cystitis is a common issue in general practice, affecting 14% of dogs over their lifetime and bacteria like *E. coli*, *Staphylococcus* Spp.,

*Corynebacterium renale*, *Proteus* Spp., *Klebsiella* Spp., *Streptococcus* Spp. are often isolated [1].

Bacteria reach the bladder by ascending infection from the urethra or genital tract. Normally the large proportions of bacterial load wash by outflow of urine. Obstruction caused by calculi, neoplasms, or other causes hindering the micturition process predisposes to this condition. Concentrated urine promotes bacterial proliferation. Infection can spread through trauma or during catheterization with a contaminated catheter [2].

Bacterial cystitis is occasionally detected in an asymptomatic animal during a normal urinalysis. Asymptomatic urinary tract infections may be caused by persistent glucocorticoid therapy, hyperadrenocorticism, chronic kidney disease, or diabetes mellitus. Asymptomatic bacteriuria occurs when bacteria are present in the urine despite the absence of a true infection (*i.e.*, bladder mucosal invasion and inflammation) [3].

Urinalysis often indicates elevated protein and hemoglobin levels in the urine. If the bacteria in urine are urease positive (*Staphylococcus* or *Proteus*), then urine pH will be alkaline (7.5-9). However, an alkaline urine pH on its own is not abnormal, as diet and other factors can influence urine pH. Cystitis is characterized by an increase in WBCs, RBCs, and/or bacteria counts [4].

## **2.CASEPRESENTATION**

A 5-year-old male mixed breed dog weighing 15 kg was brought to the Teaching Veterinary Clinical Complex, Selesih, Aizawl, Mizoram with Out Patient Department (OPD) number 1331 on 17<sup>th</sup> May 2023 having a history of fever, vomiting, inappetence, hematuria for one week, dysuria, pollakiuria, pain during urination and pain on palpation in the caudal part of abdomen. Clinical examination was done and found that animal was depressed, having pink mucous membrane and rectal temperature was 103.5°F.

Haemato-biochemical analysis showed a high TLC and neutrophils and a low TEC, hemoglobin and PCV values (Table I). Other parameters were within the normal ranges (Table II). USG findings

revealed a markedly thickened (0.63 cm) Urinary Bladder (UB) wall with highly uneven endothelial lining (Fig1) ensuring cystitis. Kidney, liver, gall bladder, and spleen were normal in USG.



Fig 1: 1<sup>st</sup> day- Urinary Bladder (Sagittal view): Markedly thickening (0.63 cm) and endothelium lining was highly uneven.

Table 1: Hematology Findings

Parameters	Value	Reference
RBC (million/ $\mu$ L)	4.4	5.5-8.5
Hb (g/dL)	9.5	12-18
PCV (%)	29.1	37-55%
WBC ( $\times 10^3$ / $\mu$ L)	24.75	6-17
Neutrophil (%)	85	51-84

Table 2: Biochemical Findings

Parameters	Value	Reference
BUN (g/dl)	28.5	8-28
Creatinine (mg/dl)	0.9	0.5-1.7
Protein (Total) (g/dl)	6.4	5.4-7.5
Albumin (g/dl)	3.4	2.3-3.1
Globulin (g/dl)	3	2.4-4.4
Bilirubin (Total) (mg/dl)	0.4	0-0.3
Direct Bilirubin (mg/dl)	0.3	0-0.3
Indirect Bilirubin (mg/dl)	0.1	0-0.1

AST (U/L)	32.5	18-56
ALT (U/L)	87.2	10-109
ALP (U/L)	56.9	1-114

On urinalysis found that color of urine was sanguineous mildly turbid, pH 7.8, RBC (10 cells/HPF), and protein was present. Urine culture was done and *Staphylococci* were found (Fig 2). Antibiotic sensitivity test recorded that amoxicillin was having a higher zone of inhibition (Fig 3).

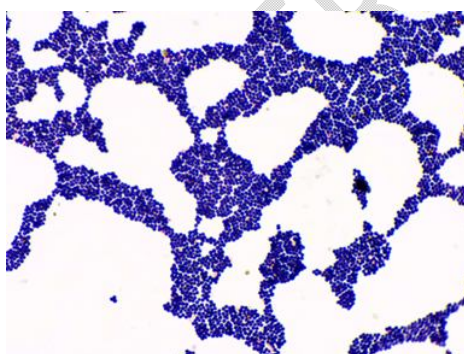


Fig 2. Urine Culture

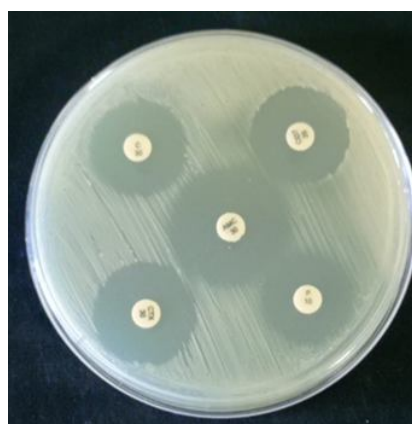


Fig 3. Antibiotic Sensitivity Test

**1<sup>st</sup> Day:** The animal was treated with Inj. RL @ 100 mL IV BID, Inj. Amoxicillin @ 150 mg IV BID, Inj. Pantoprazole @ 20 mg IV BID, Inj. Ondansetron @ 1.5 mL IV SOS, Inj. Etamsylate @ 1.5 mL SOS, Inj. Dexona @ 1.5 mL IV BID and supplement with UT-KID and Syr. Haemup for seven days.

**8<sup>th</sup> Day:** Values of hemoglobin, TEC, PCV, Hb values were increased, and TLC and neutrophil level has reduced drastically (TableIII).USG findings showed that UB wall thickness reduced to 0.4 cm and endothelial lining unevenness was also reduced (Fig 4).The condition of the dog improved and medicines were continued orally for another 2 weeks with Tab. Amoxicillin @ 1/2 tab PO BID, Tab Pantoprazole @ 1 tab PO BID, Syr. UT-KID @ 1 TSP PO BID, Syr. Zipvit @ 1 TSP PO BID, Syr. Neurobion forte @ 1 TSP PO BID.



Fig 4: 8<sup>th</sup> day- Urinary Bladder (Sagittal view): Bladder thickness is 0.4 cm

**Table 3: Comparison of Haematological Findings**

Parameter	Value (Day1)	Value (Day 8)	Reference
RBC (million/ $\mu$ L)	4.4	4.8	5.5-8.5
Hb (g/dl)	9.5	10.5	12-18
PCV (%)	29.1	32	37-55
WBC ( $\times 10^3/\mu$ L)	24.75	18	6-17
Neutrophil (%)	85	78	51-84

**21<sup>st</sup> Day:** USG findings showed that UB wall thickness comes to normal (0.2 cm) (Fig 5).

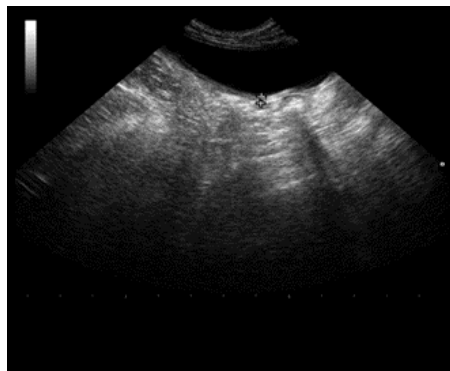


Fig 5: 21<sup>st</sup> day- Urinary Bladder  
(Sagittal view): Bladder thickness is  
0.2 cm

### 3. DISCUSSION

Cystitis is more reported in female dog since the chances of bacterial urinary tract infection is more in female dog. Female dogs are at high risk for Urinary Tract Infection (UTI) due to easier entry of bacteria through a shorter urethra [5]. In this report we found cystitis in a male dog. Clinical signs were pollakiuria, dysuria, urinary incontinence, and haematuria at the end of the urine stream which can be attributed to the damage of transitional epithelium of bladder and due to the inflammatory process [6]. The animal exhibited pain on palpation of the caudal abdomen and this also may be due to inflammatory changes. Cultural examination of the urine sample revealed the presence of *Staphylococci*. The common pathogens associated with urinary tract infections in dogs are *E.coli*, *Proteus*, *Staphylococci*, *Streptococci*, *Enterococcus*, and *Pseudomonas* [7].

In haemato-biochemical findings, the values of haemoglobin were low and this was in agreement with the observations of Kamble *et al* [8]. The lower RBC count, Hb and PCV may be connected to a mild anaemia due to haematuria [9]. WBC and neutrophils were high and this may be related to the infection. Similarly, neutrophilia symptoms were reported by Sarma and Kalita [10] in their study on cystitis.

Thickening of UB walls and uneven surface of bladder endothelial lining in USG, was due to inflammation and these findings were in agreement with Elgazaret *et al* [11]

The antibiotic was selected based on the results of antibiotic sensitivity test. The ABST was recommended for treating cases of cystitis by other workers also. This is required for a responsible use of antibiotic and for a better response based on the susceptibility spectrum of bacteria [12]. In ABST, amoxicillin was showing higher zone of inhibition and hence selected. Workers like Kandula *et al* [7] also opined that amoxicillin and enrofloxacin are highly effective against *Staphylococci* and *E. coli* infections of urinary tract.

### 4. CONCLUSION

A case of cystitis in a male dog is described along with its diagnosis, treatment and management. USG findings along with clinical symptoms and laboratory findings were helpful in diagnosing the case. ABST is an effective tool in selecting the proper antibiotic. Antibiotic and supportive therapy could alleviate the condition.

## **DISCLAMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declares that no AI technologies such as Large Language Models (ChatGPT, COPILOT, *etc*) and text-to-image generators have been used during writing or editing of manuscripts

## **Ethical statement**

The work carried as per the animal ethics norms.

Disclaimer: - This manuscript was presented in a Conference.

- Conference name: Multifaceted approaches for integrating veterinary medicine and one health for a holistic future At: Thrissur, Kerala

Available link: -

[https://www.researchgate.net/publication/383212079\\_Successful\\_Management\\_of\\_Cystitis\\_in\\_a\\_male\\_Dog](https://www.researchgate.net/publication/383212079_Successful_Management_of_Cystitis_in_a_male_Dog)

## **References**

1. Reavill DR, Lennox AM. Disease overview of the urinary tract in exotic companion mammals and tips on clinical management. Vet. Clin. N. Am. - Exot. Anim. Pract. 2020; 23:169-193.
2. Heyns CF. Urinary tract infection associated with conditions causing urinary tract obstruction and stasis, excluding urolithiasis and neuropathic bladder. World journal of urology. 2012. 30: 77-83.

3. Sykes JE, Westropp JL. Bacterial infections of the genitourinary tract. Canine and feline infectious diseases.2014; pp 871.
4. Thornton LA, Burchell RK, Burton, SE, Lopez-Villalobos N, Pereira D, MacEwan I, Gal, A. The effect of urine concentration and pH on the growth of *Escherichia coli* in canine urine in vitro. J. Vet. Intern. Med. 2018; 32: 752-756.
5. Budreckis DM, Byrne BA, Pollard RE, Rebhun RB, Rodriguez Jr CO and Skorupski KA. Bacterial urinary tract infections associated with transitional cell carcinoma in dogs. J Vet. Intern. Med.2015; 29: 828-833.
6. Piech TL, Wycislo KL. Importance of urinalysis. Veterinary Clinics: Small Anim.Pract. 2019; 49: 233-245.
7. Kandula S, Karlapudi SK, Nagaraj P. Cultural studies of urine from cystitis dogs. Pharm. Innov. 2017; 6: 247.
8. Kamble M, Kale VD, Raut SU. Urethral Calculi in a Dog and its Surgical management. IntasPolivet.2011;12: 369-371
9. Shashank J, Kumar KS, Kumar VA, Kumar BA, Lakshman M. Hematological alterations in bacterial lower urinary tract infection (cystitis) of geriatric dogs. Pharm. Innov. 2022; 264: 220-36.
10. Sarma BK, Kalita D. Changes of haematological and biochemical parameters of canine having urinary system disorders. Int. J. Chem. Stud. 2019;7: 501-504.
11. Elgazar YY, Ghanem M, Abdel-Raof YM, Helal M. Clinical, haemato-biochemical and ultrasonographic diagnostic tools of different urinary tract affections in dogs. Benha. Vet. Med. J. 2021; 40: 119-124.
12. Warland J, Bestwick J. Canine cystitis—diseases, causes and treatments. Vet. Times.2017; 47: 8-10.