



International Journal of Veterinary Sciences and Animal Husbandry



ISSN: 2456-2912

VET 2024; 9(5): 431-434

© 2024 VET

www.veterinarypaper.com

Received: 20-08-2024

Accepted: 23-09-2024

P Sarath Chandran

Undergraduate Scholar, College
of Veterinary and Animal
Sciences, Pookode, Wayanad,
Kerala, India

B Nithin

Postgraduate Scholar,
Department of Veterinary
Clinical Medicine, Ethics and
Jurisprudence, College of
Veterinary and Animal Sciences,
Pookode, Wayanad, Kerala,
India

OK Sindhu

Assistant Professor, Department
of Veterinary Clinical Medicine,
Ethics and Jurisprudence,
College of Veterinary and Animal
Sciences, Pookode, Wayanad,
Kerala, India

Sonu Jaiswal

Professor & Head, Veterinary
Clinical Complex, College of
Veterinary Science & Animal
Husbandry, A.N.D.U.A.T.,
Kumarganj, Ayodhya, Uttar
Pradesh, India

Corresponding Author:

P Sarath Chandran

Undergraduate scholar, College
of Veterinary and Animal
Sciences, Pookode, Wayanad,
Kerala, India

Polycystic kidney disease with concurrent uroabdomen in a persian cat: A case study

P Sarath Chandran, B Nithin and OK Sindhu

DOI: <https://doi.org/10.22271/veterinary.2024.v9.i5g.1745>

Abstract

A one-year old male Persian cat was presented with a history of vomiting, anorexia and anuria. The cat was dehydrated, hyperthermic, with tacky pale mucous membranes and painless abdominal distension on clinical examination. The serum biochemistry revealed azotaemia. The abdominal ultrasonography revealed intact bladder, anechoic fluid in peritoneal cavity and renomegaly with multiple well demarcated anechoic cysts (4-7 mm). Diagnostic and therapeutic peritoneocentesis and cystocentesis were performed. Uroabdomen secondary to feline idiopathic cystitis (FIC) and concurrent polycystic kidney disease (PCKD) was diagnosed. The cat was stabilized with intravenous fluid therapy and necessary supportive medications. Iodine, glycosaminoglycan and taurine supplement were given orally for a period of two months. The haemato-biochemical values returned to normal range with no detectable abdominal fluid on the 14th day follow up. This case report highlights the likelihood of comorbidity between PCKD and FIC in un-neutered male Persian cats.

Keywords: Azotemia, uroabdomen, feline idiopathic cystitis, anechoic cysts, iodine

Introduction

The Polycystic kidney disease is autosomal inherited disease commonly seen in domestic cats especially Persian/ Persian related breeds which are characterized by typical cyst formation in renal parenchyma (Domanjko-Petrič *et al.*, 2008) ^[5]. The cysts can originate in proximal tubules, distal tubules, renal cortex or medulla (Sato *et al.*, 2019; Bilgen *et al.*, 2020; Guerra *et al.*, 2020) ^[11, 2, 8]. Feline idiopathic cystitis (FIC) is the leading cause of feline lower urinary tract disease (Forrester and Towell, 2015) ^[6]. Feline lower urinary tract diseases are characterized by periuria, hematuria, dysuria, pollakiuria, with/without urinary obstruction. Feline lower urinary tract symptoms can be attributed to a wide range of conditions, including bacterial, fungal, and parasitic urinary tract infections; different forms of uroliths and urethral plugs; neoplasia; congenital or acquired anatomical or morphological abnormalities; and factors such as trauma, neurogenic issues, or iatrogenic causes (Kruger *et al.*, 2009) ^[10]. Common clinical signs of non-obstructive FIC include periuria, pollakiuria, stranguria, and gross hematuria (Westropp and Buffington, 2004) ^[14]. Sometimes these symptoms may improve over time without treatment, but they usually reoccur. In fact, recurrences with acute idiopathic cystitis are seen within one to two years of the disease. Considering factors such as lower urinary tract symptoms and the moisture content of the cat's food, the relative risk of the cat experiencing another episode of lower urinary tract issue within a 2-year period is about 65% (Kruger *et al.*, 2009) ^[10].

Materials and methods

A one-year old male Persian cat was presented with a history of vomiting, anorexia and anuria to the Outpatient unit of Department of Veterinary Medicine, Teaching Veterinary Clinical Complex, College of Veterinary & Animal Sciences, Pookode. The cat was subjected to systematic clinical and laboratory examinations. The cat was dehydrated with tacky pale mucous membrane, dull and depressed mentation with painless distension of abdomen. The complete blood count revealed elevated granulocyte count with thrombocytopenia (Table 1),

serum biochemistry revealed elevated levels of serum creatinine, blood urea nitrogen and inorganic phosphorus (Table 2).

Table 1: Complete blood count of the animal

Parameters	Result	Reference range
Total WBC count	$16.1 \times 10^3/\mu\text{L}$	$5.5-19.5 \times 10^3/\mu\text{L}$
Lymphocyte count	$1.6 \times 10^3/\mu\text{L}$	$1.5-7 \times 10^3/\mu\text{L}$
Monocyte count	$0.3 \times 10^3/\mu\text{L}$	$0-0.9 \times 10^3/\mu\text{L}$
Granulocyte count	$14.2 \times 10^3/\mu\text{L}$	$2.5-12.5 \times 10^3/\mu\text{L}$
Total RBC count	$8.05 \times 10^6/\mu\text{L}$	$5.0-10.0 \times 10^6/\mu\text{L}$
Haemoglobin	13.6 g/dL	10-15 g/dL
MCV	51.0 fL	39-55 fL
MCH	16.8 pg	13-17 pg
MCHC	33.1 g/dL	30-36 g/dL
Total Platelet Count	$150 \times 10^3/\mu\text{L}$	$300-800 \times 10^3/\mu\text{L}$

Table 2: Serum biochemistry of the animal

Parameters	Day 1	Day 14	Normal range
Creatinine	11.28 mg/dL	1.096 mg/dL	0.9-2.2 mg/dL
Blood Urea Nitrogen	105.62 mg/dL	19.81 mg/dL	19-34 mg/dL
Phosphorus	12.01 mg/dL	4.104 mg/dL	3.0-6.1 mg/dL

The cat was subjected to abdominal radiography which revealed collection of free fluid in the abdomen owing to ground glass appearance (Fig 1). Ultrasonography was done using 7.5 MHz linear probe which revealed thinning of intact bladder walls (Fig 2), presence of anechoic fluid in the peritoneal cavity with free floating intestinal loops and liver lobes (Fig 3). Enlarged kidneys were observed with multiple anechoic cysts ranging between 4-7 mm (Fig 4).



Fig 1: Right lateral abdomen showing ground glass appearance with untraceable urinary bladder margin

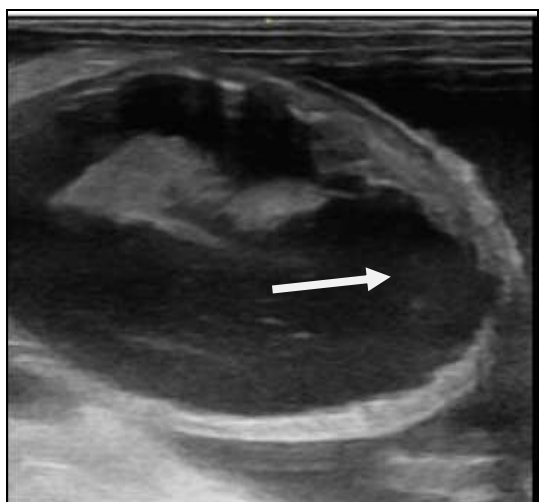


Fig 2: Ultrasonography of caudal ventral abdomen showing thinning of intact urinary bladder wall

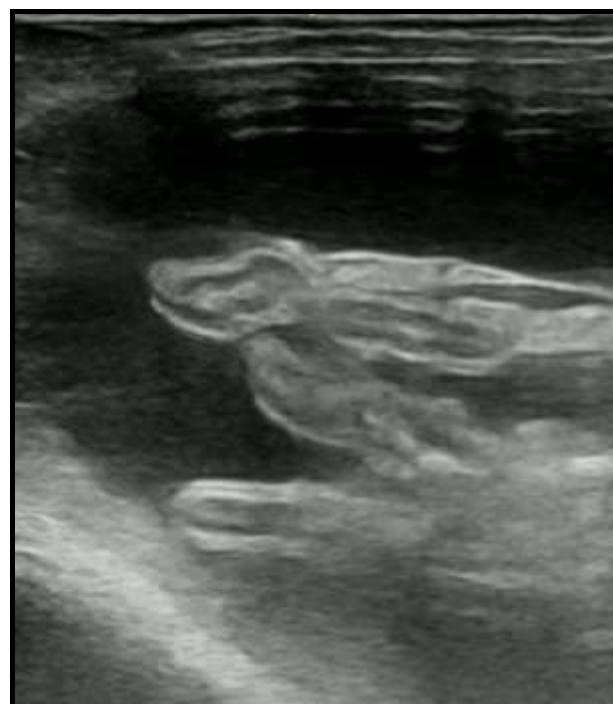


Fig 3: Ultrasonography of abdomen showing intestinal loops in the anechoic fluid in the abdomen



Fig 4: Ultrasonography of renal medulla showing distinct anechoic fluid filled cysts of size 6-7 mm

Based on anamnesis and the imaging studies the cat was diagnosed with polycystic kidney disease and concurrent uroabdomen as a result of ongoing feline idiopathic cystitis.

Results and Discussion

The cat was initially sedated with Inj. Ketamine @ 5mg/kg BW, Inj. Midazolam @ 0.2 mg/kg BW, Inj. Butorphanol @ 0.2 mg/kg BW intravenously for transurethral catheterization and peritoneocentesis; catheterization was done using silicone cath tube size FG 3 and turbid urine was evacuated. Peritoneocentesis was done using sterile 22G butterfly needle; about 100 ml of blood tinged cloudy fluid was collected from the peritoneum. Urinary bladder and peritoneal cavity were flushed with warm normal saline followed by metronidazole. Animal was stabilized with Inf. normal saline @ 10 ml/kg BW, Inf. ringer's lactate @ 30 ml/kg BW and Inj. sodium bicarbonate 7.5% @ 2mEq/Kg BW intravenously over 20 minutes. Treatment was initiated with Inj. amoxicillin-sulbactam @ 12.5 mg/kg BW, q12h, Inj. pantoprazole @ 1mg/kg BW, q24h, and vitamin B complex intravenously. Sevelamer carbonate @ 200 mg PO q12h, bethanechol @ 5

mg per cat, TID and ethamsylate @ 125 mg per cat, BID were administered orally. Renal supplements (RKleen and Nephrotec DS), glycosaminoglycan supplement (Cystopro), zinc and iodine supplement (Syr. Zincovit), taurine supplement (Syr. Catstar) were given orally for two months. The cat showed significant clinical improvement after 2 weeks of treatment. Animal showed normal urination, no abdominal fluids were noticed on ultrasonography and hematobiochemical values were well within normal range on 14th day follow up (Table 2).

Most of the clinical signs of the renal diseases could be directly related to azotemia and subsequent uremia (Breshears & Confer, 2017) [3]. Metabolic acidosis occurs when there is an imbalance of excess plasma anions over cations, leading to a decrease in plasma pH. In such cases, administering sodium bicarbonate can be beneficial for patients who have lost sodium bicarbonate due to diarrhea or renal proximal tubular acidosis (Adeva-Andany *et al.*, 2014) [1]. Renal ultrasonography of cats was suggested as an early tool for the diagnosis of renal diseases (Debruyne *et al.*, 2012) [4]. Sensitivity of USG in the detection of PKD was 91% (Domanjko-Petrič *et al.*, 2008) [5]. Midazolam @ 0.3 mg/kg, butorphanol @ 0.3 mg/kg and ketamine @ 5 mg/kg when administered intramuscularly produces effective chemical restraint with minimal cardiovascular effects and is suitable for most minor procedures (Simon and Steagall, 2020) [12]. Amoxicillin/clavulanic acid @ 7 to 39 mg/kg twice daily is commonly used as an empirical antibiotic for cats with UTI (Gerber *et al.*, 2008) [7]. Iodine when supplemented orally had anti-proliferative property and aids in cyst regression by iodination of lipids which are present in cystic fluid. Oral iodine, pre/probiotic supplementation, low glycemic index cat food and broccoli powder were found effective in treatment of PCKD in cats (Ural *et al.*, 2021) [13].

The glycosaminoglycan (GAG) layer on the bladder wall is vital for shielding the transitional epithelium. It enables the bladder to handle ongoing urine exposure and controls how urinary substances interact with the epithelial cells. Damage to the urothelium plays a major role in many chronic bladder disorders. Oral supplementation of GAG showed improvement in clinical signs in cats with FIC (Gunn-Moore & Shenoy, 2004) [9]. Vitamin and renal supplements help in improving immunity and in the regeneration of the functionality of the kidneys. During the course of treatment, the cat showed uneventful recovery from the condition. Hematobiochemical values were observed within the normal range during the follow-up.

Conclusion

Feline idiopathic cystitis and PCKD can lead to a variety of clinical signs and complications. Ultrasonographic diagnostic imaging was found much helpful for the early and proper diagnosis of the condition. Post renal azotemia was identified with hyperphosphatemia. Transurethral catheterization, peritoneocentesis, proper stabilization of the patient with parenteral fluids and multimodal therapy was helpful in amelioration of the clinical signs. The animal showed uneventful recovery from the condition. Regular monitoring of the renal function should be done for surveillance of the recurrences in future.

Acknowledgements

The authors are thankful to the Dean, Director of Clinics and Head of TVCC, College of Veterinary and Animal Sciences, Pookode.

Conflict of Interest

Authors declare no conflict of interest.

Financial Support

Not available.

References

1. Adeva-Andany MM, Fernández-Fernández C, Mouriño-Bayolo D, Castro-Quintela E, Domínguez-Montero A. Sodium bicarbonate therapy in patients with metabolic acidosis. *Sci World J.* 2014;2014:627673.
2. Bilgen N, Bişkin Türkmen M, Çınar Kul B, Isparta S, Şen Y, Akkurt MY, *et al.* Prevalence of PKD1 gene mutation in cats in Turkey and pathogenesis of feline polycystic kidney disease. *J Vet Diagn Invest.* 2020;32(4):549-555.
3. Breshears MA, Confer AW. Chapter 11-The urinary system. In: Zachary JF, editor. *Pathologic basis of veterinary disease.* 6th ed. St. Louis: Mosby; c2017. p. 617-81.e1. ISBN 9780323357753.
4. Debruyne K, Haers H, Combes A, Paepe D, Peremans K, Vanderperren K, Saunders JH. Ultrasonography of the feline kidney: technique, anatomy and changes associated with disease. *J Feline Med Surg.* 2012;14(11):794-803.
5. Domanjko-Petrič A, Černec D, Cotman M. Polycystic kidney disease: a review and occurrence in Slovenia with comparison between ultrasound and genetic testing. *J Feline Med Surg.* 2008;10(2):115-119.
6. Forrester SD, Towell TL. Feline idiopathic cystitis. *Vet Clin North Am Small Anim Pract.* 2015;45(4):783-806.
7. Gerber B, Eichenberger S, Reusch CE. Guarded long-term prognosis in male cats with urethral obstruction. *J Feline Med Surg.* 2008;10(1):16-23.
8. Guerra JM, Pellegrino A, Daniel AG, Freitas MF, Cardoso NC, Pessoa RB, *et al.* Cardiac structural and functional findings in Persian cats with autosomal dominant polycystic kidney disease. *Ciênc Rural.* 2020;50(9).
9. Gunn-Moore DA, Shenoy CM. Oral glucosamine and the management of feline idiopathic cystitis. *J Feline Med Surg.* 2004;6(4):219-225.
10. Kruger JM, Osborne CA, Lulich JP. Changing paradigms of feline idiopathic cystitis. *Vet Clin North Am Small Anim Pract.* 2009;39(1):15-40.
11. Sato R, Uchida N, Kawana Y, Tozuka M, Kobayashi S, Hanyu, *et al.* Epidemiological evaluation of cats associated with feline polycystic kidney disease caused by the feline PKD1 genetic mutation in Japan. *J Vet Med Sci.* 2019;81(7):1006-1011.
12. Simon BT, Steagall PV. Feline procedural sedation and analgesia: when, why and how. *J Feline Med Surg.* 2020;22(11):1029-1045.
13. Ural K, Mutlu H, Erdogan H, Erdogan S. Iodine is one of the odds for therapeutic armamentarium against feline polycystic renal disease. *Int J Vet Anim Res.* 2021;4(2):63-68.

14. Westropp JL, Buffington CT. Feline idiopathic cystitis: current understanding of pathophysiology and management. Vet Clin North Am Small Anim Pract. 2004;34(4):1043-1055.

How to Cite This Article

Sarath Chandran P, Nithin B, Sindhu OK. Polycystic kidney disease with concurrent uroabdomen in a persian cat: A case study. International Journal of Veterinary Sciences and Animal Husbandry 2024; 9(5): 431-434.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.