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Olgu Sunumu

A CASE OF POLYCYSTIC KIDNEY DISEASE IN A PERSIAN CAT

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Bir İran Kedisinde Polikistik Böbrek Hastalığı Olgusu

Özet: Polikistik Böbrek Hastalığı (PBH); otozomal dominant bir gen tarafından oluşturulan ve özellikle İran kedileri ile egzotik kedilerde görülen, kalıtsal bir hastalıktır. Sporadik olarak görülen hastalık böbrek yetmezliği gelişene kadar asemptomatik seyreder. Hastalığın tanısı en erken 7 haftalık iken yapılan abdomen ultrasonografisi ve DNA testi ile konulabilir. Olgumuzu karın bölgesinde bilateral şişkinlik, kilo kaybı, poliüri, polidipsi ve letarji şikayetleriyle İstanbul Üniversitesi Veteriner Fakültesi İç Hastalıklar Kliniği'ne getirilen 7 yaşında erkek bir İran kedisi oluşturdu. Rutin genel muayenesinde vücut ısısı normal olmasına karşın halsiz olduğu gözlenen hastanın her iki böbreğinin de normal konturlarını kaybettiği ve aşırı büyümüş olduğu saptandı. Abdomenin ultrasonografik muayenesinde her iki böbreğin de büyüdüğü, ve her böbrekte de korteks ve medulladan köken alan ve çapları 2-15 mm arasında değişen, çok sayıda kistin bulunduğu izlendi. Yaşam kalitesini düzeltmek amacıyla medikal tedavisi düzenlenen hasta 36 gün sonra hayatını kaybetti.

Anahtar Kelimeler: Polikistik böbrek hastalığı, iran kedisi, herediter hastalık.

Abstract: Feline polycystic kidney disease (PKD) is an inherited autosomal dominant disease that has been identified in Persian cats and Persian related breeds such as the Exotic Shorthair cats. PKD has been reported sporadically in the veterinary literature and progress asymptomaticly until the renal deficiency is observed. Diagnosis of the PKD can be carried out by abdominal ultrasonography and DNA test in 7 weeks old. Our case was a 7 years old male Persian cat which had been brought to Department of Internal Medicine, Faculty of Veterinary Medicine, İstanbul University with complaints such as weight loss, polydipsia, polyuria, lethargy and bilateral enlargement of abdomen. Although the body temprature and outline of the kidneys were normal in physical examination, the cat was lathergic and both of the kidneys was enlarged. At the result of ultrasonographic evaluation, the enlargement of the both kidneys were observed and numerous cysts were determined which were originated from both medulla and cortex of the kid-

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neys and their diameters were changed between 2-15 mm. Although a medical therapy protocol had carried out for the purpose of increasing the quality of his life, the patient was died of 36th day of the treatment.

Key Words: Polycystic kidney disease, persian cats, inherited disease.

Introduction

Feline polycystic kidney disease (PKD) is an inherited autosomal dominant disease that has been identified especially in Persian and exotic cats **(1, 8)**. Regarding ultrasonoghraphic examination reports, PKD has been recorded in 35 %-70 % of the Persian cats **(12, 13)**. The cats that developed PKD, may not show any clinical sign until the adult ages. Indeed the clinical signs may be observed at the older ages **(1, 9).**

Ultrasonography and DNA test methods is more likely used to identify the PKD when compared to IV urography and radiography methods **(1, 4, 5)**. Ultrasonographical diagnosis of PKD may be carried out at 9-10 months of age with 98 % success rate however in some cases, identification of the disease may be carried out as early as 7 weeks of age with the same method **(1, 2)**. The cases of PKD can not be identified at early ages, the disease may develop asemptomatically until 7 years of age and may be presented with moderate or severe azotemia, increasing the creatinine rate, reducing the haematocrit rate, polyuria, polydipsia, lethargy, gingivitis and stomatitis **(1).** Generally in the cats with PKD, renal failure may not accompany until the older ages (mean 7 years old age) **(14, 15)**.

There is no certain treatment for PKD. The cats that are showing the signs of the disease, may have prolonged life time within hemodialysis. Renal transplantation may be a choice even if necessary.

Case

The subject of this case report was 2.8 kg body weight, 7 years old male Persian cat. Patient had been referred to Department of Internal Medicine, Faculty of Veterinary Medicine, Istanbul University with complaints such as weight loss, polydipsia, polyuria, lethargy and abdominal distension. Dehydration (> 5%), pale mucos membranes, halitosis, ulcerated areas on tongue were observed at the clinical examinations. A results of three consecutive blood pressure measurement revealed, mean value was determined as 151 and 72 mmHg (systolic and diastolic, respectively). Increased serum BUN (112 mg/dl), creatinin (4.0 mg/dl), Ca (11.9 mg/dl), P (15.8 mg/dl) levels and, reduced red blood cell count (4.22 $x10^6$ µL), PCV (19%) and hemoglobine (5.9 g/dl) levels were

determined in total blood count and serum biochemistry examinations **(Table 1)**. Urine analysis revealed protein-creatinine ratio as 1.041, urine pH as 6.5, and urine dansity as 1.010 and, in microscobic examination revealed 1-2 red blood cell, 1-2 white blood cell, and 8-10 kidney epithelium were determined in of urine sediment.

Table 1: Hematological and biochemical findings in a Persian cat with polycystic kidney disease
Tablo 1: Polikistik böbrek hastalıklı bir İran kedisinde hematolojik ve biyokimyasal bulgular

Findings	Reference values	Results
RBC ($\times 10^6 \mu$ L)	6.0-10.0	4.22
HGB (g/dl)	9.5-10.5	5.9
HCT (%)	29-45	19
WBC ($\times 10^3 \mu$ L)	5.5-19.5	12.4
PLT ($\times 10^3 \mu$ L)	150-600	161
MCV	41-54	45
MCH (pg)	13.3-17.5	14
MCHC (%)	31-36	32
Glucose (mg/dl)	70-150	226
BUN (mg/dl)	15-34	112
Kreatinin(mg/dl)	0.8-2.3	4
AST (IU/L)	5-55	19
ALT (IU/L)	28-76	34
T.PROTEİN (g/dl)	5.9-8.5	7.3
ALBUMİN (g/dl)	2.4-4.1	2.5
Ca (mg/dl)	7.5-10.8	11.9
P (mg/dl)	3.0-7.0	15.8

Doppler ultrasonographic examinations of the kidneys revealed, resistive index and pulsatility index within normal ranges (0.62-0.60, 5.08-5.25, respectively).

After the IV administration of 300 mg/ml iodine contrast medium (Ultravist 300®, 50 ml, Schering A, Germany); ventro-dorsal radiograpies were recorded on 5. second, 5. minute, 20. minute and 40. minute and no contrast medium passage was observed into ureters and urinary bladder **(Figure 1)**. Numerous cysts were determined on the transversal and longitudinal ultrasonographic views of the both kidneys and their diameters were changed between 2-15 mm **(Figure 2)**.

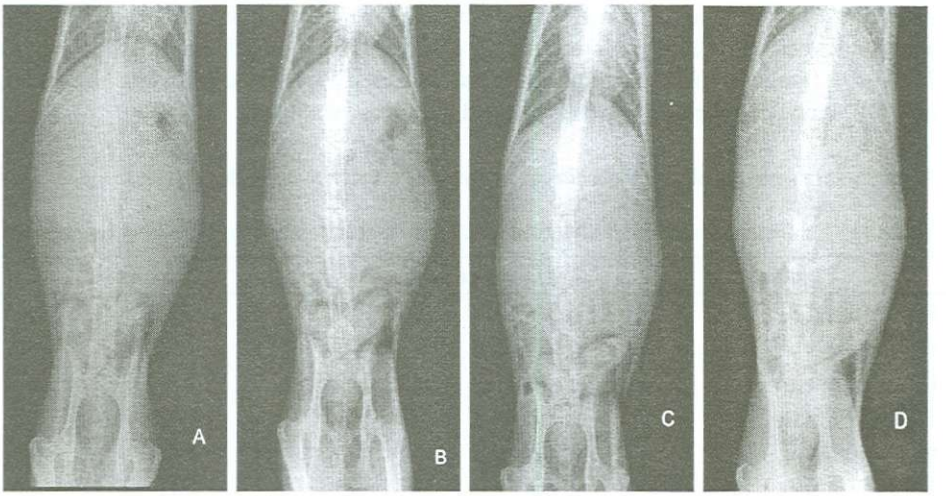

Figure 1: IV Urography view: A- 5th sec., B-5th min., C- 20th min., D- 40th min.
Şekil 1: IV Pyelografi görüntüleri: A- 5. sn, B- 5. dk., C- 20. dk., D- 40. dk.

Figure 2: Ultrasonographic view of the right kidney of the present case.
Şekil 2: Olgumuzun sağ böbreğinin ultrasonografik görüntüsü.

In an attempt to enrich life expectancy of the present case, medical therapy has initiated including single dose of anabolic steroid, ACE inhibutor against the proteinu-

ria, aluminium hydroxide against the hyperphosphatemy, diuretic for azotemia, vitamin E as an antioxidant agent, B complex vitamin, 0.9% NaCl for rehidration. Patient was died at the 36th day of the treatment.

Results and Discussion

Feline PKD is an inherited, progressive, water filled cysts characterized disease that has been identified in Persians and Persian related breeds such as exotic short hair cats **(1).**

The present case was referred to our clinic with complaints of anorexia, lethargy, polyuria, polydipsia, abdominal distension and weight loss. Results of the clinical examinations, serum biochemistry and urinary analysis findings were in association with PKD symptoms **(1, 2).**

Although hypertension is determined in most of the human PKD patient, this condition is different in cats **(10, 11)**. Hypertension may not develope in most of the cats with PKD and very few of the cases may show mild hypertension were determined **(10, 11)**. The results of three consecutive blood pressure measurements in the present case ranged between normal references.

Different methods may be used for diagnosis of PKD but the most definitive method is ultrasonoghraphy **(1, 2, 3, 5-7)**. It was reported that the sensitivity of ultrasonographic examination is 75% and accuracy rate is 100% in younger than 16 weeks old Persian cats, however, it was found that the sensitivity of ultrasonographic examination was 91% and accuracy rate was 100% in older than 16 weeks Persians **(9).**

Several studies reported that, when IV urography was performed for diagnosis of PKD, no passage to ureters and bladder were determined **(1)**. In this case, nephrogram and ureterogram phases were not observed in ventro-dorsal radioghraphies taken at 5^{th} second and 5^{th} minute of urography.

However numerous cysts ranged 2-15 mm diameter localised in cortex and medulla of both kidneys were determined at ultrasonographical examination and this findings were supported by literature **(1, 2, 3, 5-7).**

There is a commercially available, that might be used in contact DNA test for diagnosis of PKD and for this test it is enough that touching a steril swap to the gingiva **(4)**. This DNA test method has not been performed in our country with the swap from gingiva.

For this purpose, it is necessary to perform blood testing, urinalysis and ultrasonographic examination routinely Persian breed cats, Persian related and exotic short haired cats and only PKD negative cats should use for breeding.

KAYNAKLAR

1. **Battershell, D., Garcia, J.P.:** Polycystic Kidney in a Cat, Journal of the American Veterinary Medical Association, 1969; 154: 665-666.
2. **Biller, D.S., DiBartola, S.P., Eaton, K.A., Pflueger, S., Well, M.L.:** Inheritance of Polycystic Kidney Disease In Persian Cats, Journal of Heredity, 1996; 87: 1-5.
3. **Beck, C., Lavelle, R.B.:** Feline Polycystic Kidney Disease in Persian Cats; A Prospective Study Using Ultrasonography, Aust. Vet. J., March 2001; Vol 79, No. 3.
4. **Leslie A. Lyons,** Feline Tests, Erişim 26/05/2009, Department of Population Health and Reproduction, University of California Davis, http://www.vgl.ucdavis.edu/services/cat.php
5. **Bonazzi M.:** Prevalence of the Polycystic Kidney Disease and Renal and Urinary Bladder Ultrasonographic Abnormalities in Persian and Exotic Shorthair Cats in Italy. Journal of Feline Medicine and Surgery, 2007; 9: 387-391.
6. **Barthez, P.Y., Rivier, P., Begon, D.:** Prevalence of polycystic kidney disease in Persian and Persian related cats in France . Journal of Feline Medicine and Surgery, 2003; 5: 345-347.
7. **Barrs, V.R., Gunew, M., Foster, S.F., Beatty, J.A., Malik R.:** Prevalence of Autosomal Dominant Polycystic Kidney Disease in Persian Cats and Related-Breeds in Sydney and Brisbane, Aust Vet J, April 2001; Vol 79, No: 4.
8. **Rawlings C.A., Bjorling D.E., Christie B.A.:** Kidneys. In: Textbook of Small Animal Surgery, Ed. Slatter D. Saunders Company, 2003: 1607.
9. **Biller DS et al:** Inheritance of Polycystic Kidney Disease in Persian Cats. J Heredity, 1996; 87: 1-5.
10. **Pedersen KM et al:** Increased mean arterial pressure and Aldosterone-to-renin Ratio in Persian Cats with Polycystic Kidney Disease. J Vet Intern Med, 2003, 17: 21-27.
11. **Miller RH et al:** Effect of Enalapril on Blood Pressure, Renal Function, and the Renin-Angiotensin-Aldosterone System in Cats with Autosomal Dominant Polycystic Kidney Disease. Am J Vet Res, 1999; 60: 1516-1525.
12. **Cannon MJ et al:** Prevalence of Polycystic Kidney Disease in Persian Cats in the United Kingdom. Vet Rec, 2001; 149: 409-411.
13. **Barrs VR et al:** Prevalence of Autosomal Dominant Polycystic Kidney Disease in Persian Cats and Related Breeds in Sydney and Brisbane. Aust Vet J., 2001; 79: 257-259.
14. **Stebbins KE:** Polycystic Disease of the Kidney and Liver in an Adult Persian Cat. J Comp Pathol, 1989; 100: 327-330.
15. **Bosje JT, van den Ingh TS, van der Linde-Sipman JS:** Polycystic Kidney and Liver Disease in Cats. Vet Q, 1998; 20: 136-139.