ERCİYES ÜNİVERSİTESİ VETERİNER FAKÜLTESİ DERGİSİ
Journal of Faculty of Veterinary Medicine, Erciyes University
Olgu Sunumu / Case Report
11(3), 221-225, 2014

Hepatocellular Carcinoma in a Dog

Zülfikar Kadir SARITAŞ[1], M Fatih BOZKURT[2], Musa KORKMAZ[1], F.Durmuş BAŞER[3], Turan CİVELEK[3]
[1]*Afyon Kocatepe University, Faculty of Veterinary Medicine, Department of Surgery, Afyonkarahisar-TURKEY*
[2]*Afyon Kocatepe University, Faculty of Veterinary Medicine, Department of Pathology, Afyonkarahisar-TURKEY*
[3]*Afyon Kocatepe University, Faculty of Veterinary Medicine, Department of Internal Medicine, Afyonkarahisar-TURKEY*

Summary: A female Terrier dog with the age of 11 was brought to our hospital with complains of anorexia, loss of weight, lethargy and abdominal swelling. In the abdominal palpation, a mass extending towards the caudal in the right quadrant was identified. Presence of a mass was confirmed in the direct radiographic examination, which supports the clinical finding. In the abdominal ultrasonography it was determined that the liver had lost its homogenous structure, there was free fluid in the abdomen, and the liver borders were irregular. The ALP, total protein, ALB and GGT were identified as 328 IU/L, 2.74 g/dl, 1.85 g/dl and 12.2 U/l respectively in the biochemical analysis. Experimental laparotomy was applied to the case and a diffused mass was identified in the liver. Samples were taken from the neoplastic masses during the operation and the abdomen was closed after identifying diffused neoplastic formations in all lobes. Following the histo-pathological examination of the sample, the patient was diagnosed with hepatocellular carcinoma. In this paper, it was aimed to report the clinical, radiological, ultrasonographic, biochemical and haematological findings of a hepatocellular carcinoma observed in a dog.

Key Words: Biochemical analysis, dog, hepatocellular carcinoma, ultrasonography

Bir Köpekte Hepatosellüler Karsinom

Özet: 11 yaşlı dişi Terrier ırkı köpek, anoreksi, zayıflama, uyuşukluk ve abdominal genişleme şikayetlerıı ile hastanemize getirilmiştir. Abdominal palpasyonda abdomenin sağ kadranında kaudale doğru uzanan kitle belirlenmiştir. Olguda direkt radyografik muayenede klinik bulguyu destekleyen kitle varlığı teyid edilmiştir. Abdominal ultrasonografide karaciğerin homojen yapısını kaybettiği, abdomende serbest sıvı varlığı belirlenmiş ve karaciğer sınırlarının düzensiz olduğu saptanmıştır. Biyokimyasal analizde ALP'nin 328 IU/L, total proteinin 2.74 g/dl, ALB'in 1.85 g/dl, GGT'nin 12.2 U/l olduğu belirlendi. Deneysel laparotomi yapılan olguda karaciğerde yaygın kitle varlığı belirlendi. Operasyon sırasında tümöral kitlelerden örnekler alınarak tüm loplarda yaygın tümöral oluşumların varlığının belirlenmesi üzerine abdomen kapatıldı. Alınan örnekten yapılan histopatolojik incelemede hepatosellüler karsinom tanısı kondu. Sonuç olarak bir köpekte rastladığımız hepatosellüler karsinom olgusunun; klinik, radyolojik, ultrasonografik, biyokimyasal ve hematolojik bulgularının paylaşılması amaçlanmıştır.

Anahtar Kelimeler: Biyokimyasal analiz, hepatosellüler karsinom, köpek, ultrasonografi

Introduction

It is reported that the primary hepatocellular tumors (Hepatocellular carcinoma, hepatoma) are rarely seen in animals (6). Hepatocellular Carcinoma (HCC) is most frequently observed in dogs and cattle and less often in pigs and cats (6). Canine HCC is divided into three morphological groups as massive, nodular and diffuse, and massive lesion which involves a single liver lobe is the most common one (4). Liver lobectomy is the recommended therapy method and prognosis after surgical excision is reported to be good in dogs (4). It is defined in the literature that the ultrasonographic findings of the cellular carcinoma commonly vary depending on a single or multiple focal lesion presence or wide hepatic mass presence (hyperechoic, hypoechoic, mix) (3). In the present case presentation, it is aimed to report the HCC case diagnosed in a dog admitted to our hospital.

Case Presentation

A female Terrier dog with the age of 11 which was admitted to Afyon Kocatepe University Veterinary Faculty Animal Hospital and displayed complains of loss of appetite and abdominal swelling in the last two weeks constituted the material of the case presentation. The case had a breast cancer surgery 3 years ago. The abdomen was hanging and stretched and a mass in the abdomen that

Geliş Tarihi/Submission Date : 10.01.2014
Kabul Tarihi/Accepted Date : 26.02.2014

Figure 1. Radiographic view of case (V/D)

Figure 2. Ultrasonographic view of case

extended from the right quadrant towards the caudal was palpated. Direct radiography of the abdomen was taken and abdominal ultrasonography was performed. In the meantime, venous blood sample was taken and biochemical and hematological analyses were initiated (Tables 1 and 2). The liver was found to be enlarging (hepatomegaly) towards the caudal in the radiography taken in V/D position (Figure 1). In the ultrasonography (USG), it was determined that the liver had lost its homogenous appearance, its borders became irregular, there was a heterogeneous structure concordant with the massive appearance and there was free fluid in the liver. The hepatomegaly was confirmed with the USG findings, which supported the radiography (Figure 2). It was found in the biochemical measurements that the alkaline phosphatase (ALP) level increased whereas total protein (TP), albumin and glucose levels decreased (Table 1). Leukocytosis was detected in the hematological examination. The hematocrit (HCT) level together with mean corpuscular volume (MCV) and mean corpuscular hemoglobin (MCH) levels displayed a decrease (Table 2).

Table 1. Biochemical analysis results of case

Parameter	Results	Reference range
ALT	47 U/L	5-60
AST	47 U/L	5-55
ALP	**328 U/L**	10-150
UREA	45.m mg/dL	18.8-55.6
T. Bilirubin	0.07 mg/dL	0.10-0.60
D. Bilirubin	0.00 mg/dL	≤0.3
Ca	9.4 mg/dL	8.7-11.8
P	3.59 mg/dL	2.9-6.2
TP	**2.74 g/dL**	5.5-7.5
ALB	**1.85 g/dL**	2.6-4.0
CK	**445.9 U/L**	14-120
LDH	160.7 U/L	24-219
GLU	**46 mg/dL**	60-125
GGT	**12.2 U/L**	1-10

Table 2. Haematological findings of case

Parameter	Results	Reference range
WBC	$24.6X10^9$/L	6.0-17.0
RBC	$5.69X10^9$/L	5.50-8.50
HGB	11.0g/dL	11.0-19.0
HCT	33.0 %	39-56
MCV	58.1 fL	62.0-72.0
MCH	19.3 pg	20.0-25.0
PLT	$203x10^9$/L	117-460

Figure 3. View of the masses in the liver during surgery

Since these findings indicated a possibility of liver failure and neoplasia, we decided to perform experimental laparotomy after taking the permission of patient's owner. After the support therapy, preparations for the operation were made and the experimental laparotomy on the median line was performed. During laparotomy, the liver was determined to be enlarging and diffuse neoplastic formations were detected in all lobes (Figure 3). Tumor surgery on the liver was not considered since the neoplastic formations were diffuse. Some samples were taken from the neoplastic formations and the dog was awakened after ensuring the homeostasis. Pain management was provided by administering tramadol intravenously in 2 mg/kg dose in the postoperative period.

Histopathological examination

The gray mass of 3x2x2 cm dimensions which was taken during the operation and sent in formol was fixed in a neutral formalin solution for 48 hours. Routine tissue processing was followed and it was embedded in paraffin. Sections of 4-6 microns were taken by using microtome. Immunohistochemical staining was performed on the sections with hematoxylin-eosin (HE) and by using Ki-67 and pan-cytokeratin antibodies via the avidin-biotin-peroxidase complex method. In the microscopic examination, hypochromatic cell islands that originate from the hepatocytes and that are encompassed by thin connective tissues and consist of cells that display atypical properties with one or two nucleoli, round and big nuclei and narrow cytoplasm were observed (Figure 4a). In the immunohistochemical examination, pan-cytokeratin, which is an epithelial tumor indicator, was positive in most of the regions (Figure 4b). Proliferation index was found approximately 50% as a result of the staining using Ki-67 (Figure 4c). Based on findings, the case was diagnosed with HCC.

Discussion

It is reported that there is insufficient amount of data regarding the clinical signs of HCC in dogs (6). The non-specific clinical findings seen in dogs are reported as anorexia, vomiting, ascites, lethargy, loss of weight and abdominal swelling. It is also suggested that the palpable abdominal mass in the HCC can easily be detected (6). Anorexia, loss of weight, lethargy and abdominal signs of the current this case are in line matching up with the literature. On the other hand,

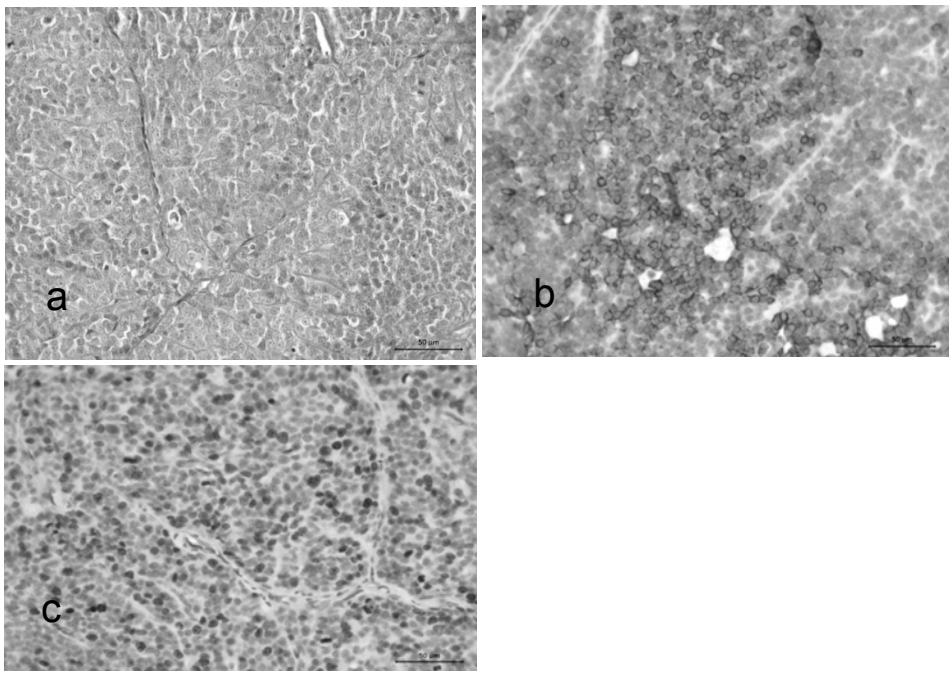

Figure 4 a,b,c. Histopathologic sections of mass

abdominal mass was detected in the radiography and USG. Cucovillo and Lamb (1) performed the ultrasonographic examination of the liver lesions of 21 dogs and 1 cat in their retrospective study and they determined HCC in two cases in dogs. They performed biopsy in one of these cases and they reported that they applied necropsy or laparotomy to the other. They determined an irregular anechoic central region in the USG of the target lesion in one of the cases. They thought that it was the reflection of the necrotic tissue cavity. In this case, it was determined that the liver lost its homogenous structure, its borders became irregular and it took a heterogeneous form. ALP is a membrane-bound glycoprotein which is present in many tissues. In the HCC case seen in a dog, ALP level was determined as 9820/IU (2). The high level of ALP in this case supports the reported case. Moreover, an increase in hypoalbuminemia and a decrease in the GGT together with hypoglycemia were determined in the biochemical analyses. In light of these findings, development of liver failure was concluded. Liver lesions in all lobes identified during the experimental laparotomy supported the results of biochemical analyses. It is reported that serum alpha-fetoprotein (AFP) measurement can be used in the diagnosis of HCC (5). The AFP was not measured in this case.

In the hemogram of the case; leucocytosis was present; the haemoglobin was in the lower limit; haematocrit was low; and the MCV was reduced, all of which were considered to support the clinical and histopathological findings. Surgery was not performed in the present case since diffuse neoplastic formations were present in all lobes of the liver. In this study, it was aimed to report the USG and laboratory findings of a 11 years old female, Terrier dog with the HCC.

References

1. Cuccovillo A, Lamb CR. Cellular features of sonographic target lesions of the liver and spleen in 21 dogs and a cat. Vet Radiol Ultrasound 2001; 43(3): 275-8.
2. Fukui Y, Sato J, Sato R, Yasuda J, Naito Y. Canine serum thermostable alkaline phosphatase isoenzyme from a dog with hepatocellular carcinoma. J Vet Med Sci 2006; 68 (10): 1129-32.
3. Lodi M, Chinosi S, Faverzani S, Ferro E. Clinical and ultrasonographic features of canine hepatocellular carcinoma (CHC). Vet Res Commun 2007; 31 (Suppl 1): 293-5.

4. Seki M, Asano K, Ishikagi K, Iida G, Watari T. En block resection of a large hepatocellular carcinoma involving the caudal vena cava in a dog. J Vet Med Sci 2011; 73(5): 693-6.

5. Yamada T, Megumi F, Kitao S, Ashida Y, Nishizono K, Tsuchiya R, Shida T, Kobayashi K. Serum alpha-fetoprotein Values in Dogs with Various Hepatic Diseases. J.Vet.Med.Sci, 1999; 61(6): 657-9.

6. Yener Z, Keleş İ, Karaca M. Bir van kedisinde hepatosellüler karsinom. Vet Bil Derg 2001; 17 (2): 57-63.

Corresponding Author:

Zülfikar Kadir SARITAŞ. DVM, PhD.
Afyon Kocatepe University, Faculty of Veterinary Medicine,
Department of Surgery. A.N.S Campus.
TR-03200. Afyonkarahisar-TURKEY
Tel: +90 272 228 13 12-16203.
Fax:+90 272 228 13 49
e-mail: zksaritas@hotmail.com.