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Diagnosis and clinical Management of Hepatic Fibrosis in an adult Rottweiler Bitch: A case report

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Abstract

A four-year-old Rottweiler bitch was presented to the Veterinary Medicine unit of Referral Veterinary Polyclinic of ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly (Uttar Pradesh) with the history and clinical signs of fever (103.7 °F), pink mucous membrane, inappetance, distended abdomen and black feces from 10 days. On the basis of hematobiochemical and ultrasonographic findings, the present case was diagnosed as hepatic fibrosis and treated accordingly. After five days of treatment bitch showed marked improved in its condition and all the parameters were within the normal range.

Keywords: Hepatic fibrosis, hyperechoic echogenicity, D-penicillamine, prednisolone

Hepatic fibrosis is characterized by progressive accumulation of fibrillary extracellular matrix (ECM) components in the liver (Gressner *et al.,* 2008; Bircher 1999 and Friedman 2007). It is a wound healing response to chronic injury and inflammation in which there is an imbalance between ECM deposition and removal, leading to excess ECM accumulation (Ramachandran and Iredale, 2012). The most common cause of hepatic fibrosis in dogs is chronic hepatitis, which is histologically characterized by hepatocyte apoptosis or necrosis, inflammation, mononuclear cell infiltration and fibrosis. The fibrosis often co-localizes with necrosis and, especially for idiopathic chronic hepatitis, is initially present in the periportal zones of the liver (Cullen 2009). With more advanced fibrosis, portal-portal or portal-central bridging fibrosis may develop with eventual formation of discrete nodules (van den Ingh *et al.,* 2017).

When copper accumulation is the primary cause of liver disease, it usually initially accumulates in the centrilobular zones. Centrilobular to bridging fibrosis was reported in Labrador retrievers with copper-associated chronic hepatitis (Smedley *et al.,* 2009). Granulomatous hepatitis is an uncommon form of chronic hepatitis in dogs (Poldervaart *et al.,* 2009) and may be the result of infectious diseases such as schistosomiasis (Rodriguez *et al.,* 2014), histoplasmosis (Chapman *et al.,* 1993), *Angiostrongylus vasorum* infection (Cook *et al.,* 2015), leishmaniasis (Rallis *et al.,* 2005), lymphoma and histiocytosis ((Chapman *et al.,* 1993). Because fibrosis now is recognized to be a continuous remodeling process, in which either net collagen deposition or resolution takes place inhibiting mediators of collagen deposition or enhancing mediators of ECM degradation may result in regression of fibrosis (Younis *et al.,* 2016).

Case History, Observations and Treatment

A four-year-old Rottweiler bitch was presented to the Veterinary Medicine unit of Referral Veterinary Polyclinic of ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly (Uttar Pradesh) with the history and clinical signs of fever (103.7 °F), pink mucous membrane, inappetance, distended abdomen and black feces from 10 days with proper vaccination and deworming previously. After clinical examination, blood sample and serum sample were collected for hemato-biochemical examination and simultaneously ultrasonography was also performed.

Hematological examination revealed decreased in hemoglobin concentration, total erythrocyte and lymphocyte count and slightly increase in neutrophils while other parameters were within the normal range. Serum biochemical examination revealed increased in total serum bilirubin, direct bilirubin, AST and ALT while decreased in serum total protein, serum albumin and A:G ratio (Table-1). Ultrasonographic examination revealed partially distended urinary bladder, apparently shrunken some hepatic lobes, complete loss of architectural details in the parenchyma, hyper echogenicity of liver to spleen in some areas and lobes, clear but markedly rough, rounded and uneven margins of liver, partially distended gall bladder and cystic duct with thickened wall and presence

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Table -1: Hemato-biochemical parameters

Parameter	Pre-treatment Values	Post-treatment values	Normal Range
Hb (g/dL)	9.2	12.6	11.9-18.9
T.E.C. (Million/mm^3)	2.75	5.53	4.95-7.87
T.L.C. (10^3/mm^3)	13.95	7.0	5.0-14.1
Neutrophils %	74	81	58-85
Lymphocytes %	20	19	08-21
Monocytes %	06	0	02-10
Hemoprotozoa	Negative	Negative	-
Total Bilirubin (mg %)	1.9	0.5	0.1-1.0
Direct Bilirubin (mg %)	1.3	0.3	0.1-0.5
Indirect Bilirubin (mg %)	0.6	0.2	0.1-0.5
AST (IU/L)	77	32.7	08-37
ALT (IU/L)	112	77.4	10-88
ALP (IU/L)	490	89	037-147
Serum Total Protein (g/dL)	5.8	6.5	6.0-8.2
Albumin (g/dL)	2.5	4.2	3.5-5.2
Globulin (g/dL)	3.7	2.3	2.6-3.8
A: G	0.68	1.83	1.5-2.1

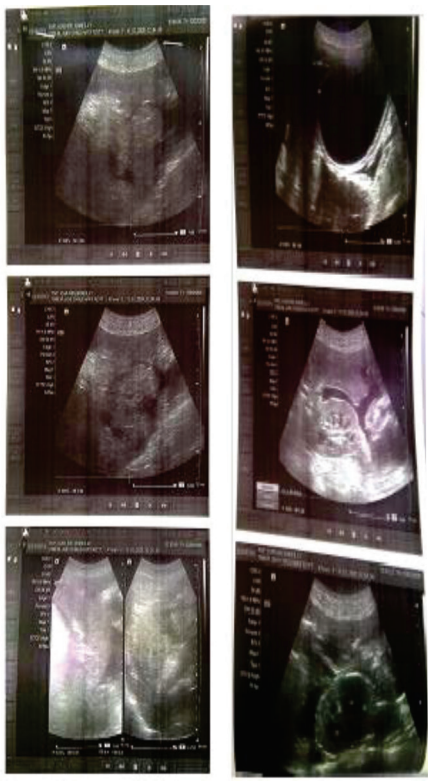

Fig.1: Ultrasonography of Liver

of excessive quantity of clear, free abdominal fluid (Fig.1).

On the basis of these findings, the present case was diagnosed as hepatic fibrosis and treated with tablet D-penicillamine @ 15 mg/kg b. wt. orally bid, tablet prednisolone @ 0.5 mg/kg b. wt. orally daily in tapering dose manner, Injection Amoxirum forte @ 20 mg/kg b. wt. intravenously bid, Hepasafe plus syrup @ 5 ml orally bid, Inj. Neuroxin-M 4 ml Intravenous daily and injection furosemide @ 2 mg/kg b. wt. intramuscularly. After five days of treatment bitch showed marked improved in its condition and all the parameters were within the normal range.

Discussion

Hepatic fibrosis is reduced after chelation with D-penicillamine. It may be related to reduction of collagen formation. Collagen is a type of tissue compound that forms as part of scar tissue that result from inflammation. Penicillamine binds copper, iron, mercury, lead, and cystine which then are excreted in the urine (Dirksen and Fieten, 2017). Glucocorticoids bind to glucocorticoid receptors in the cytoplasm. These complexes are translocated to the nucleus, where they act on glucocorticoid response elements and initiate the transcription of anti-inflammatory and immunomodulatory protein coding genes (eg, IL-10) (Barnes 1998). Inflammatory genes are under transcriptional control of nuclear factor-kappa B and activator protein-1. Glucocorticoids inhibit the effects of these transcription factors (Kagoshima *et al.,* 2003 and Adcock *et al.,* 2004). Prednisolone treatment was associated with longer median survival times (Strombeck *et al.,* 1988).

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