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Case Report

Visceral Larva Migrans: Case Series

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Abstract: Visceral larva Migrans (VLM) due to *Toxocara canis* or *Toxocara cati* is rare in developed countries. We report a series of nine cases of eosinophilic liver abscesses that were diagnosed in patients who attended the outpatient clinic and patients who were admitted to the hospital. All these patients were evaluated for complaints of fatigue, generalized body weakness and loss of appetite. Upon evaluation an imaging (ultrasound/CT/MRI) of the abdomen revealed multiple peripherally enhancing discrete as well as conglomerate hepatic lesions. The subtle and nonspecific clinical features of these patients on evaluation lead to the diagnosis of VLM.
Keywords: Visceral larva Migrans, *Toxocara canis*, *Toxocara cati*, appetite

INTRODUCTION

Larva migrans is a term used to describe a group of clinical syndromes which are a consequence of the movement of parasite larvae through host tissues. These symptoms vary with the extent of migration and location of the larvae. Organisms may travel through the skin (cutaneous larva migrans), internal organs (visceral larva migrans) and even involve the eye (ocular larva migrans). Each one of these forms of the disease can be caused by a number of organisms [1]. Visceral Larva Migrans (VLM) is a most commonly caused by larvae of dog roundworm (*Toxocara canis*) or the cat roundworm (*Toxocara cati*). Beaver and colleagues were the first to describe VLM in 1952 in their description of a series of children who presented with fever, pulmonary infiltration; hepatomegaly, peripheral eosinophilia and hypergamma globulinemia [2]. Other terms used to describe VLM are Weingarten's disease, Frimodt-Moller's syndrome, and eosiniphilic pseudoleukemia [3]. Liver is the most common visceral organ affected in patients with VLM [4].

CASE REPORTS

Case 1

A 54 year old male non diabetic, non hypertensive presented to the hospital with complaints of generalized weakness, loss of appetite for the past 2 weeks. There was no history of any preceding illness. She had two pet cats and used to cuddle them up quite often. On examination she had a blood pressure of 130/70 mm of Hg, pulse rate of 90bpm,respiratory rate of 20/min and a SPO_2=98% on room air. A triple phase contrast enhanced MRI abdomen (Figure1 and Figure 2) revealed multiple peripherally enhancing discrete as well as conglomerate hepatic lesions with predominant distribution along portal vein and attendant portal vein thrombosis, suggestive of eosinophilic abscesses secondary to hepatic visceral larva migrans(Figure3). A fine needle aspirate taken from the lesion showed presence of an eosinophilic abscess with the presence of scattered polymorphs, eosinophils and lymphocytes admixed with a few Charcot Leyden crystals (Figure 4).

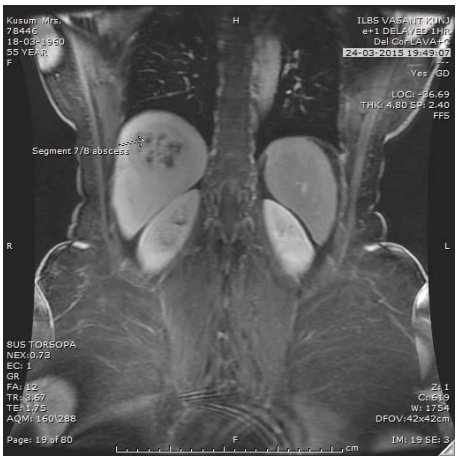

Fig-1: MRI abdomen saggital section: showing multiple peripherally enhancing discrete as well as conglomerate hepatic lesions.

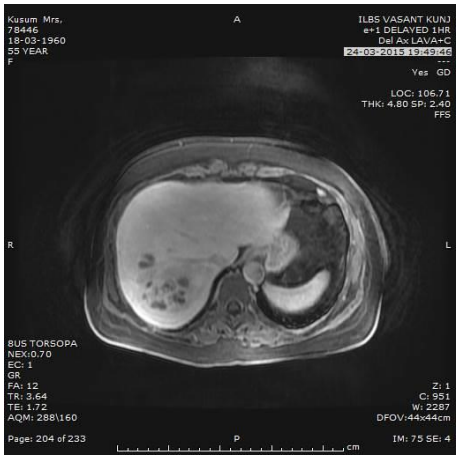

Fig-1: MRI abdomen axial section: showing multiple peripherally enhancing discrete as well as conglomerate hepatic lesions.

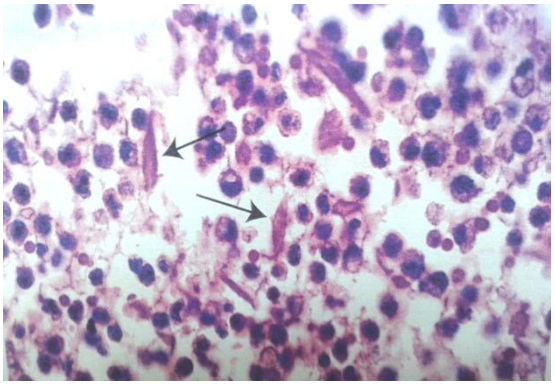

Fig-3: H&E stain 40x-arrow points the charcot leyden crystals.

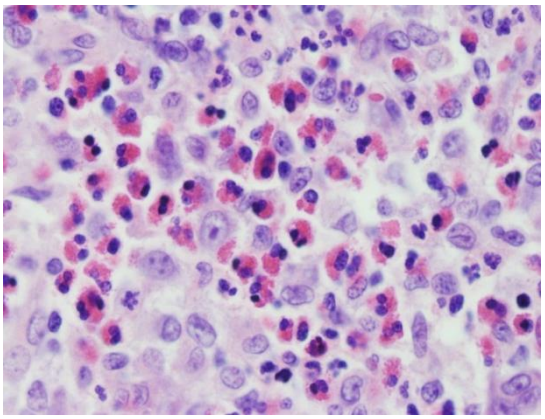

Fig-4: H&E stain,40x : pointer on eosinophils, bright orange granules makes them stand out, rest bigger cells are histiocytes

Case 2

A 44 year old gentelman was admitted with complaints of fever since 5 days and pain abdomen which was localized to the right upper quadrant. The fever was high grade and associated with chills and rigors. On examination he had a BP of 120/80mm of Hg, pulse rate-110/min, respiratory rate was 22/min and was maintaining a saturation of 98% on room air. The laboratory reports were as shown in table. Ultrasound abdomen showed four hypoechoic partially liquefied lesions in both the lobes of liver with the largest in segment VII measuring 4.9x4.2x5.7 cm. A fluid cytology obtained from the abscess was consistent with eosinophilic abscess.

Case 3

A 41 year old woman diabetic since 1 year and on regular medication in the form of oral hypoglycemic agents was admitted with complaint of fever along with pain abdomen since 3 months. The fever was high grade, intermittent in nature and was associated with chills. She did not give any history suggestive of high-risk sexual behavior, consumption of alcohol, smoking or use of illicit drugs. The patient was a sales executive by profession and lived alone with a stray dog that she had adopted. There was no history suggestive of having any respiratory symptoms or visual changes, nausea, vomiting, chest pain, changes in bowel habits, melena or hematochezia. There were no focal defects on neurologic examination. There was no cervical, axillary or inguinal lymphadenopathy. An MRI abdomen showed multiple hypodense lesions in the liver. An FNAC from the lesion showed findings suggestive of eosinophilic liver abscess with the presence of Charcot Leyden crystals.

Case 4

A 7 year old boy presented to the outpatient clinic with complaints of intermittent fever with chills since 15days along with a feeling of vague discomfort in the right hypochondrium. The fever was low grade and the patient complained of generalized weakness and a feeling drained out throughout the day. This was associated with dry cough, loss of appetite and pica. There was a history of jaundice one year back which lasted for 2 months. There was no history of passing worms. He used to play with a pet dog at home. Examination revealed a febrile child with hepatosplenomegaly and anemia. Examination of the fundus was normal. A CT abdomen showed multiple hypodense intensities in the right lobe of liver involving the segment VI and VII. An FNAC from the lesion showed findings consistent with eosinophilic liver abscess.

Case 5

A 7 year old girl was brought to the outpatient clinic with complaints of fever with chills along with loss of appetite since 1 week. The child had been lethargic and listless for a week prior to the onset of fever. The mother gave history of pica and said that the child had persistent cough for the past 20 days. The family was non vegetarian used to have cattle liver quite often. There was no history of passing worms. On examination the child had fever of 101F and mild hepatosplenomegaly. Ultrasound abdomen done showed 4 abscesses with the largest measuring 6 x5.5 x 5 cm^3. An FNA done from the abscess revealed the presence of an eosinophilic liver abscess.

Case 6

A 14 year old boy was admitted to the hospital with complaints of dragging pain in the abdomen localized to the right hypochondrium since 12 days. This was associated with high grade fever along with chills for 4 days. He had two episodes of vomiting on the day he was admitted to the hospital. The vomitus was non foul smelling and contained ingested food. Mother gave history of pica and they were non vegetarians with consumption of chicken almost four days a week. An ultrasound abdomen abdomen showed three hypoechoeic lesions localized to the right lobe of liver with the largest measuring 2x3x4 cm^3. An FNAC done from the abscess showed findings consistent with eosinophilic liver abscess.

Case 7

A 55 year old lady presented to the outpatient clinic with complaints of pain localized to the right upper quadrant of abdomen since 7 days along with fever with chills since 4 days. The fever was high grade and was relieved only intermittently on taking medications. The pain was constant and dull aching, and it was associated with fever of up to 101 F, chills and night sweats. She had unintentional weight loss of 11kgs over the previous 2 months. There was no history suggestive of any visual changes or respiratory symptoms, chest pain, nausea, vomiting, changes in bowel habits, passing black stools or hematochezia. An ultrasound abdomen revealed two abscesses with the largest measuring 5x 5.4x5.5cm^3. An FNAC from the abscess was consistent with findings suggestive of eosinophilic abscess.

Case 8

53 year old lady presented with history of no symptoms, except mild fatigue over the past one month. She had no history of allergic diseases. She was a non-smoker, but a heavy drinker for the previous 20 years. She had no exposure to pets, but did have a history of consuming raw meat. There were no abnormal findings on physical examination. She had no jaundice, right upper quadrant tenderness or hepatomegaly. She had no fever and his other vital signs were also normal. Abdominal imaging revealed an abscess in the left lobe of the liver measuring 2x3x4 cm^3. An FNAC done from the abscess showed findings consistent with eosinophilic liver abscess.

Case 9

38 year old lady came with complaints of mild fatigue along with low grade fever which was present usually in the evenings. Her father was a poultry farm owner, and they consumed raw chicken liver. She had no exposure to soil or pets. She did not give any history of alcohol consumption or smoking. There was no history suggestive of any visual changes, difficulty in breathing, chest pain, nausea, vomiting, and changes in bowel habits, passing black stools or hematochezia. An ultrasound abdomen revealed multiple abscesses with the largest measuring 4.5x3.5x4cm3. An FNAC from the abscess was consistent with findings suggestive of eosinophilic abscess

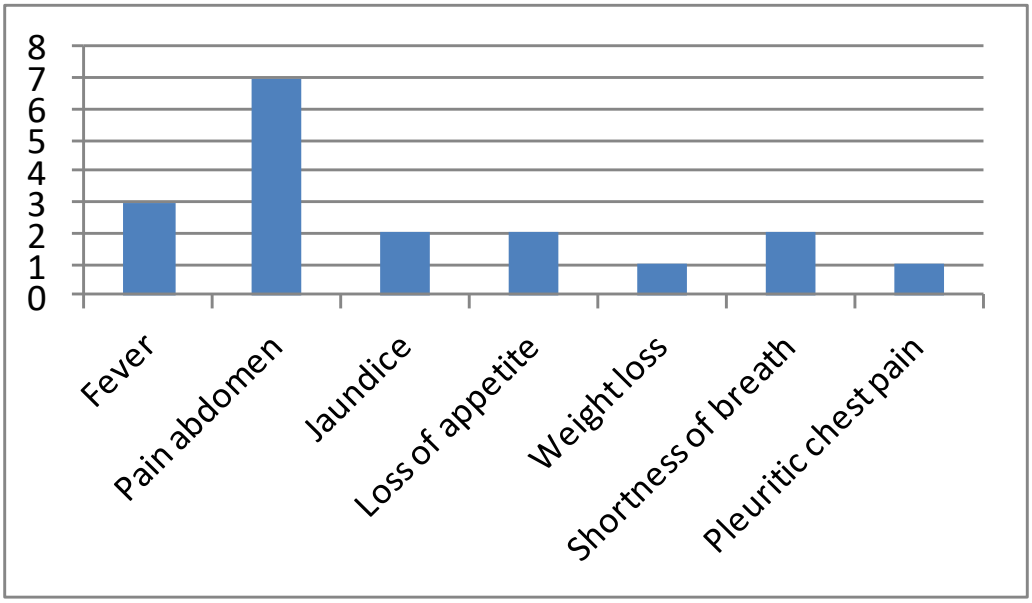

Fig-5: Clinical features of the patients at presentation to the hospital.

Table-1: Laboratory parameters of the patients

Hb	TLC	Platelets	Blood Urea	Serum Creatinine	Sr.Na	Sr.K	INR	Bil	Direct bil	Indirect Bil	AST	ALT	SALP	GGTP	Sr.Albumin
11.1	6.7	183	17	0.54	136.7	4.16	1	0.8	0.3	0.5	46	64	189	161	3.9
13.8	22.9	276	129	3.27	127.5	4.47	1.28	4.18	2.63	1.55	55	47	202	72	2.3
10	6	157	24	0.6	139	4.21	1	0.5	0.05	0.45	52	38	89	25	3.9
11	11.2	294	17	0.28	138	4.6	1	0.5	0.2	0.3	88	133	447	135	4.2
7.9	32.1	296	23	0.25	134	4.98	1.3	0.7	0.3	0.4	31	27	209	168	1.4
12.3	19.1	179	22.8	0.41	139	4	1.49	0.6	0.1	0.5	41	62	210	50	3.8
12.5	9.4	341	12.9	0.82	139.7	3.9	0.91	4.5	3.8	1.7	41	53	162	87	3.3
9.5	5.4	150	25.8	0.64	137.5	4.9	1.06	0.3	0.1	0.2	119	90	141	54	3.1
11.7	9.8	437	12	0.55	135	5.4	1.28	0.4	0.1	0.3	29	29	70	30	3.2

DISCUSSION

After they migrate through the bowel wall and blood vessels the larvae gain access into the portal venous circulation. These larvae then pass through the liver and consequently leave an impression of tissue distruction, which manifests as interstitial edema, necrosis, haemorrhage and eosinophilic infiltrates. This results in granulomatous inflammation which can lead to the development of granulomatous hepatitis [5, 6].

Among our cases of the nine patients four were males and five were females. Three had low grade fever; seven had pain abdomen and three had two had jaundice at presentation to the hospital. The clinical signs and symptoms that are seen in these patients result due to the damage caused by migrating larvae and the subsequent inflammatory response shown by the host. The tissues which are most sensitive to invasion by the parasite include the liver, lungs, eyes and central nervous system (CNS). Inflammation leads to the formation of eosinophilic granulomas. The common manifestations of toxocariasis are fever, abdominal pain, hepatomegaly, splenomegaly, along with symptoms of lower respiratory tract infection, such as cough, dyspnea or bronchospasm [7, 8]. Two patients complained of loss of appetite, one of them had weight loss, two patients complained of shortness of breath and one had chest pain on inspiration. A history of pica was present in three patients.

In addition to these symptoms nephritis, myocarditis, CNS invasion causing neuropsychiatric symptoms, seizures and encephalopathy, asthma,urticaria, prurutis along with functional bowel disorders have also been described [9-11]. Growth of liver multiple granulomas with necrotic and/or fibrotic areas could lead to acute cholestatic hepatitis [12].

Laboratory evaluation of patients with toxicariasis reveals leukocytosis with notable eosinophilia (eosinophil fraction 1.7–8.5) [13]. Other tests can often reveal hypergammaglobulinemia and elevated anti-A or anti-B isohemagglutinin titers [14]. ELISA is the standard serologic test used to confirm toxocariasis.

A typical liver biopsy shows central necrosis that is surrounded by a mixed inflammatory infiltrate with numerous eosinophils and variable numbers of neutrophils, lymphocytes and Charcot-Leyden crystals, is strongly suggestive of VLM [15]. On examination six patients had hepatomegaly and three patients had splenomegaly. Blood examination revealed that two patients had sepsis with raised total leucocyte counts and hypereosinophilia. One of the patients had acute kidney injury.

On contrast CT of abdomen the lesions have been described as multiple, ill defined,ovoid,1-1.5cm in diameter, hypodense and non subcapsular in location [16-18]. The portal venous phase best depicts the nodularity and margins of these lesions. Characteristic T1 weighted hypointensity-isointensity and T2 weighted hyperintensity has documented [18]. Two other helminthiases that can result in similar CT findings—human fascioliasis and capillariasis. These lesions are differentiated from metastatic lesions by looking for ill-defined margins, elliptical shape and uniform sized lesions of 1–2 cm diameter [19]. Granulomas or abcesses can appear on abdominal CT scans as ill-defined nodules that are similar in appearance to other inflammatory lesions [20]. As hepatic toxocariasis has a nonspecific appearance on a CT scan, it can be mistaken for another diagnosis. The differential diagnosis for these multiple low-density liver nodules also includes other granulomatous diseases (i.e. sarcoidosis),microabscesses, hepatocellular carcinoma or liver metastases. When these findings are accompanied by peripheral eosinophilia, the diagnosis of hepatic toxocariasis must be considered and further serologic or pathologic testing must be carried out [21, 22]. In our series imaging of the abdomen revealed multiple conglomerate hepatic lesions in seven patients and single abscess in two patients. Of the seven patients who had multiple abscesses the maximum number of abscesses was five in two of the patients. Eight patients

had the abscesses confined to the right lobe of the liver. An FNA done from the abscess revealed the presence of an eosinophilic liver abscess in all the case. Charcot Leyden crystals were seen on microscopy in five patients.

CONCLUSION

On contrast-enhanced computed tomography (CT) imaging he had a single, 2.16 cm, oval, ill-defined, low-attenuation hepatic nodule which was best appreciated during the portal venous phase of the scan. Clinicians should consider hepatic toxocariasis as a possible diagnosis in any individual who presents with eosinophilia of unknown etiology and an ill-defined hepatic lesion on CT imaging. A finding of eosinophilic granulomas on tissue biopsy is strongly suggestive of VLM, and a causative organism should be sought.

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