



# Hepatic Visceral Larva Migrans: A Case Series

Suchita Jain<sup>1</sup> Ajay K. Jain<sup>2</sup> Praveen Agrawal<sup>1</sup> Priyanka Bhagat<sup>3</sup> Debi Chatterji<sup>2</sup>

<sup>1</sup> Department of Radio-diagnosis and Imaging, Choithram Hospital & Research Centre, Indore, Madhya Pradesh, India

<sup>2</sup> Department of Gastroenterology, Choithram Hospital & Research Centre, Indore, Madhya Pradesh, India

<sup>3</sup> Department of Pathology, Choithram Hospital & Research Centre, Indore, Madhya Pradesh, India

**Address for correspondence** Ajay Kumar Jain, MD, DM, DNB, MNAMS, FISC, Department of Gastroenterology, Choithram Hospital & Research Centre, Manik Bagh Road, Indore, Madhya Pradesh 452014, India (e-mail: ajayvjain@yahoo.com).

J Gastrointest Infect 2023;13:79–83.

## Abstract

### Keywords

- ▶ visceral larva migrans
- ▶ eosinophilia
- ▶ parasitic infections of the liver
- ▶ toxocariasis
- ▶ albendazole
- ▶ eosinophilic abscess

Visceral larva migrans is an uncommon systemic parasitic infection of liver caused by second-stage larva of *Toxocara canis* or *Toxocara cati*. The liver is the most common visceral organ to be involved. The diagnosis is usually delayed because of a lack of awareness about visceral larva migrans in adults, with most patients confused with either an abscess or neoplastic nodules. Heterogenous solid cystic, multiple hypodense, and hypovascular lesions on imaging with peripheral eosinophilia make the diagnosis in most cases. We present four adult patients with 2 to 4 weeks of fever and very high peripheral eosinophilia. The liver biopsy in three cases revealed an eosinophilic abscess. All cases on treatment with albendazole showed a good response. Visceral larva migrans must be considered in patients with heterogenous, hypovascular space-occupying liver lesions presenting with fever and peripheral eosinophilia.

## Introduction

Visceral larva migrans (VLM) is a systemic zoonotic parasitic disease caused by migrating second-stage larva of *Toxocara canis* or *Toxocara cati* through the viscera of human beings. The eggs of these ascarids are common environmental contaminants of human habitation, and humans ingest embryonated eggs by accident.<sup>1</sup> Larvae, after hatching, fail to mature in the aberrant host; instead, they wander and reach different parts of the body, including the liver, lungs, eyes, brain, or heart. In these organs, the worm larvae cause varying degrees of local inflammation leading to nonspecific symptoms.<sup>2</sup> There are two forms of clinical expressions visceral and ocular. The liver is the most common visceral organ to be involved due to its blood supply. Despite being a public health problem, it remains neglected, and diagnosis is delayed and challenging. Secondly, it is predominantly considered a disease of children;

hence, most adult patients with VLM are initially treated as a liver abscess or neoplastic mass in the liver. Here, we describe a case series of four adults with hepatic VLM

## Case Series

### Case 1

A 23-year-old female presented with right upper quadrant dull aching abdominal pain of 15 days' duration and low-grade intermittent fever with nausea and decreased appetite. Hemogram revealed mild anemia and leukocytosis with predominately peripheral eosinophilia (eosinophil count 34%). Computed tomographic (CT) abdomen showed an ill-defined heterogeneous solid cystic lesion in segments VI and VII, multiple lymph nodes at the porta, para-aortic, and aortocaval region. Liver biopsy is suggestive of the eosinophilic abscess.

received

May 31, 2023

first decision

June 13, 2023

accepted

July 7, 2023

article published online

October 12, 2023

DOI <https://doi.org/>

10.1055/s-0043-1776263.

ISSN 2277-5862.

© 2023. Gastrointestinal Infection Society of India. All rights reserved.

This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

**Table 1** Demographic, clinical, and laboratory investigations of all four patients at presentations

Name of investigation	Case I 23 years, female Student hails from semiurban background No H/O contact with pets	Case II 47 years, female Housewife from rural background. H/O Contact with pets during childhood	Case III 28 years, female In private job from urban background. No H/O contact with pets	Case IV 64 years, male Retired from job staying in urban areas for last many years. No H/O contact with pets
Presenting symptoms	RUQ pain for 15 days, low-grade intermittent fever Nausea and Decreased appetite	Low-grade fever, decreased appetite, weight loss of 10 kg in last 2 months, and mild dull aching upper abdominal pain for the last 1 month	High-grade, intermittent fever and RUQ pain of 3 months duration	High-grade intermittent fever, decreased appetite for last 2 months, known diabetic
Hemoglobin	10.4	11.4	10.4	8.3
Total leucocytes	11,110	12,750	8,660	27,940
Differential leucocytes	P-42; L-21; E-33; M-4	P-41; L-16; E-39; M-4	P-32; L-27; E-35; M-4; B-2	P-94; L-2, M-4 E-3
Platelets	3.52	4.69	1.50	4.81
Serum bilirubin (mg%)	0.29	0.36	0.29	0.81
AST (SGOT) IU	15	43	86	25
ALT (SGPT) IU	16	36	123	22
SAP	94	90	287	289
GGT	29		86	490
Serum proteins (gm%)	8.0	8.1	7.7	7.1
Serum albumin (gm%)	3.8	3.6	3.6	3.2
INR	1.19	1.07	1.34	1.35
Serum creatinine (mg %)	0.53	0.55	0.5	0.94
Hydatid serology	Positive	Negative	Negative	Negative
Amoebic serology	Negative	Negative	Borderline positive 12.3 (normal up to 12)	Negative
AFP	4.0	2.24	-	4.84
Sonography of upper abdomen	A heterochoic lesion with cystic area and thick walls in right lobe measures 8 × 6.5 × 6.8cms with enlarged peripancreatic nodes measuring about 2 cm	Multiple small cystic lesions seen in right lobe of liver suggestive of pyogenic abscess	Heterogenous hyperechoic to hypoechoic lesion in right lobe of liver	There are multiple hypoechoic areas in right and left lobe of liver suggestive of multiple abscess
Cross-sectional imaging of upper abdomen	CECT: Ill-defined heterogeneous solid cystic lesion in seg VI & VII measuring 9.5 × 6.6 × 5.5 cm having an attenuation of 14–16 HU. multiple LN at porta, para-aortic	CECT: Multiple hypodense hypovascular lesion in right lobe with few showing central necrotic area	MRI: A cluster of multiple ill-defined intercommunicated rounded to elongated lesion within hepatic parenchyma with thrombotic occlusion of posterior and inferior	Multiple variable-sized cluster of coalescing fluid density lesions along the adjoining surfaces of right and left lobe of liver, in caudate lobe and in segment of V of liver

**Table 1** (Continued)

Name of investigation	Case I 23 years, female Student hails from semiurban background No H/O contact with pets	Case II 47 years, female Housewife from rural background. H/O Contact with pets during childhood	Case III 28 years, female In private job from urban background. No H/O contact with pets	Case IV 64 years, male Retired from job staying in urban areas for last many years. No H/O contact with pets
Liver biopsy	and aorto-caval with largest LN measuring 1.9 × 1.0cm Eosinophilic micro abscesses, epithelioid cell granuloma with central necrosis, cellular debris and retractile hook-lets, bile duct loss with ductular proliferation, patchy intra-hepatocytic cholestasis. No larval were identified	Portal tracts are infiltrated with polymorphonuclear and eosinophilic infiltrate and PAS positive Charcot-Leyden crystals suggestive of parasitic infestation	segmental branches of right portal vein Distorted lobular architecture with eosinophilic abscesses. An ill formed granuloma with necrosis is seen. Few Charcot-Leyden crystals are seen	Not done

Abbreviations: AFP, Alpha fetoprotein; ALT, alanine aminotransferase; AST, aspartate aminotransferase; CECT, contrast-enhanced computed tomography; GGT, gamma glutamyltransferase; HU, Hounsfield unit; INR, international normalized ratio; LN, lymph node; MRI, magnetic resonance imaging; PAS, periodic acid-Schiff; PETS, —; RUQ, right upper quadrant; SGOT, serum glutamic-oxaloacetic transaminase; SGPT, serum glutamic-pyruvic transaminase.

**Case 2**

A 45-year-old female had a low-grade fever, decreased appetite, and weight loss of 10 kg in the last 2 months, and mild, dull aching upper abdominal pain for the last month. Hemogram revealed a total leucocyte count of 12,750 with peripheral eosinophilia (eosinophil count of 39%). CT abdomen was suggestive of multiple hypodense, hypovascular lesions in the right lobe of the liver, with few showing central necrotic area. Her liver biopsy was suggestive of the eosinophilic abscess.

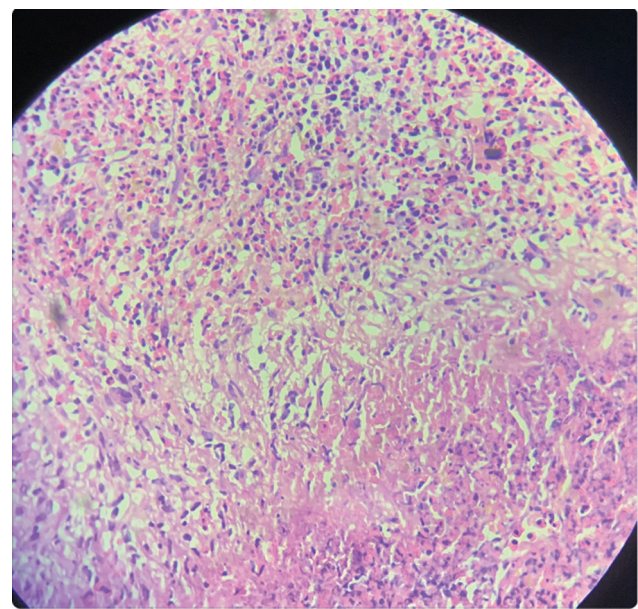
**Case 3**

A 26-year female presented with high-grade, intermittent fever, and right upper quadrant pain of 3 months. Magnetic resonance imaging (MRI) of the upper abdomen showed multiple ill-defined, lobulated, and communicated rounded and elongated lesions in the liver with the postcontrast enhancement of lesions. Investigations revealed a total leucocyte count of 8,660 with an eosinophil count of 35%.

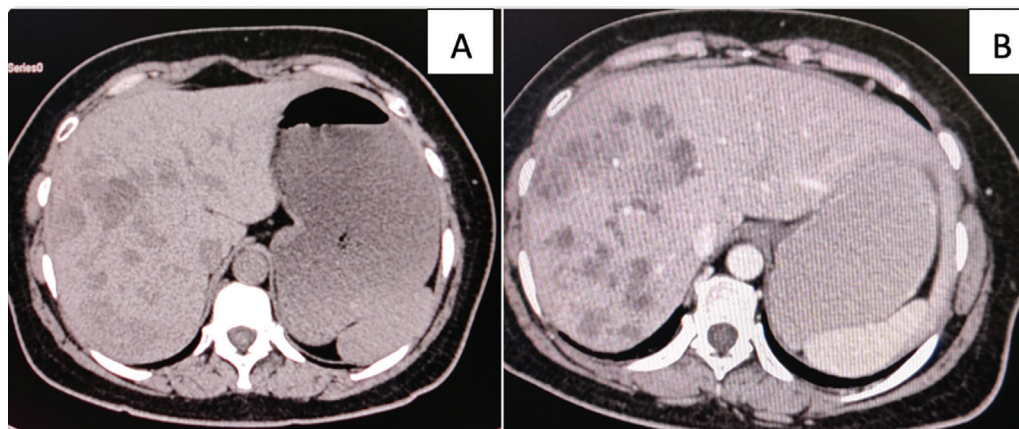
**Case 4**

A 64-year-old diabetic male presented with high-grade intermittent fever for the last 2 months, initially treated for a liver abscess with an attempt to drain it percutaneously with no improvement. CT scan of the abdomen revealed multiple variable-sized clusters of coalescing fluid density lesions along the adjoining surfaces of the right and left lobe, caudate lobe, and segment V of the liver. The clinical, laboratory parameters and imaging studies of all these patients are summarized (→Table 1).

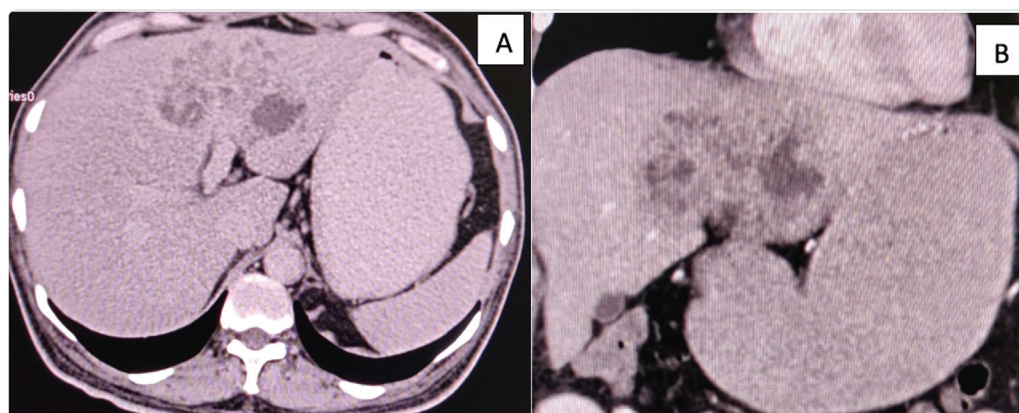
Three of these patients, who were further evaluated with liver biopsy, were found to have an eosinophilic abscess (→Fig. 1). The fourth patient, an elderly diabetic, did not consent to a biopsy. The blood and urine cultures sent in all these patients showed no evidence of bacterial infection. All



**Fig. 1** Liver biopsy from patient 1 showing eosinophilic abscess along with an ill formed granuloma with necrosis (H & E stain, 400X.zip).



**Fig. 2** Triple-phase computed tomographic abdomen plain (A) and arterial phase (B) from patient 2, showing a large cluster of multiple rounded heterogeneous irregular hypodense lesions with subtle peripheral enhancement in the right lobe.



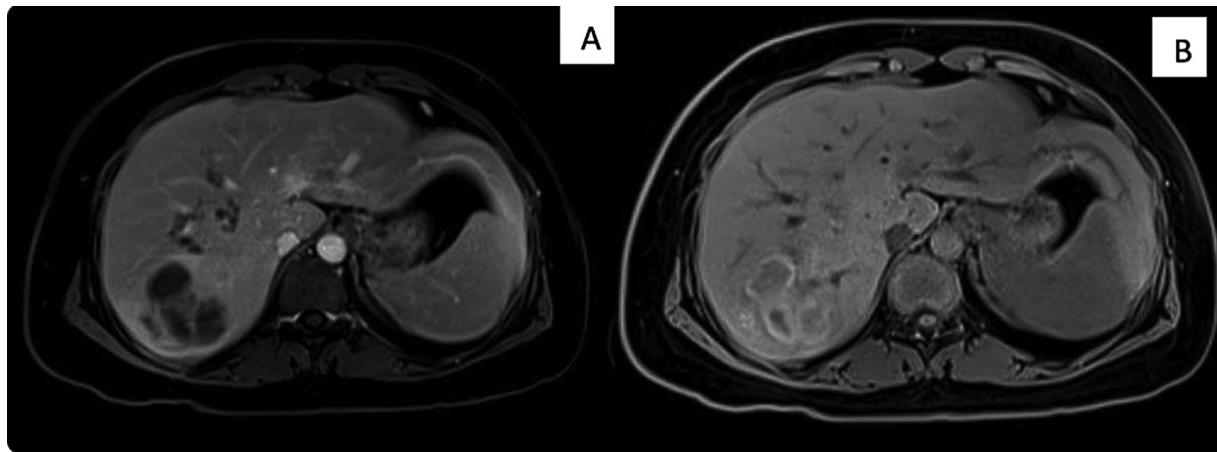
**Fig. 3** Triple-phase computed tomographic abdomen plain (A) and arterial phase (B) from patient 4, showing a conglomerate of multiple hypodense, hypovascular lesions in the left lobe of the liver with few showing central necrotic area.

four patients responded to oral albendazole.<sup>3</sup> With this albendazole treatment, there was a complete resolution of fever and pain and a significant reduction in the size of liver space-occupying lesions (SOL). Post-treatment eosinophil count decreased to normal in all three patients who had high eosinophil count before starting treatment. All patients on follow-up were asymptomatic with no pain in the abdomen and fever.

## Discussion

VLM is a disease described predominantly in children due to accidental ingestion of embryonated eggs of *Toxocara canis* or *Toxocara cati*, but of late, many adults with VLM have been reported. All these patients present with fever, significant abdominal pain, and SOL of the Liver.<sup>4</sup> Most of these patients are initially treated like liver abscesses because of fever and SOL within the liver for a few weeks without any improvement. Some of these patients have aspiration, which sometimes lead to secondary infection. Occasionally VLM may be complicated by vascular injuries such as portal vein thrombosis, or arterial pseudoaneurysm. Sometimes these SOLs are interpreted as neoplastic. None of these patients responded to initial treatment done with antibiotics and

antiamoebic drugs. On evaluation, we found that these patients had significant peripheral eosinophilia. On contrast-enhanced computerized tomography, these lesions within the liver appear as a conglomerate of heterogeneous solid cystic nodular lesions, which are hypodense, and hypovascular (►Figs. 2 and 3). Contrast-enhanced MRI of the upper abdomen showed a cluster of low attenuating, nonspherical small nodular lesions with fuzzy margins. These lesions enhance on the hepatic arterial phase with no washout on equilibrium and delayed phases (►Fig. 4). Another feature seen on this MRI is a T1 hypointense rim around the abscess cavity, which is a layer of granulation tissue that favors an infective origin more than a malignant origin. These lesions may show a change in morphology and position on follow-up imaging, a finding consistent with the migration of larvae. Sometimes, linear tracts are also seen, which could be a very useful imaging feature that raises a suspicion of VLM. Another important differentiating feature and a clue to the diagnosis in these patients is the “presence of significant peripheral eosinophilia” with a “cluster of coalescing lesions which appears as solid cystic lesions in the liver on imaging.”<sup>5</sup> Liver biopsy of these lesions typically shows eosinophilic abscesses suggestive of parasitic



**Fig. 4** Contrast-enhanced axial magnetic resonance imaging arterial phase (A), and delayed phase (B) from patient 3 showing cluster of multiple hypointense nonspherical lesions with peripheral rim enhancement on delayed scan.

infestation (→Fig. 1). The majority of these patients respond very well to oral albendazole therapy.<sup>6</sup> However, hepatic segmental resection may also be required in some cases.

## Conclusion

VLM must be considered in patients with prolonged fever, heterogenous, hypovascular space-occupying liver lesions, and peripheral eosinophilia.

### Ethical Statement

Ethics Committee of Choithram Hospital & Research Centre approved the submission of this case series for publication.

### Data Availability Statement

There is no data associated with this work.

### Authors' Contribution

All authors contributed equally to the article.

### Funding

None.

### Conflict of Interest

None declared.

## References

- 1 Rohilla S, Jain N, Yadav R, Dhaukhandi DB. Hepatic visceral larva migrans. *BMJ Case Rep* 2013;2013:bcr2013009288
- 2 Baever PC, Jung RC, Cupp EW. *Clinical parasitology*, 9th edn. Philadelphia, PA: Lea & Febiger, 1984:320–329
- 3 Hombu A, Yoshida A, Kikuchi T, Nagayasu E, Kuroki M, Maruyama H. Treatment of larva migrans syndrome with long-term administration of albendazole. *J Microbiol Immunol Infect* 2019;52(01):100–105
- 4 Lim JH. Toxocariasis of the liver: visceral larva migrans. *Abdom Imaging* 2008;33(02):151–156
- 5 Laroia ST, Rastogi A, Sarin SK. Case series of visceral larva migrans in the liver: CT and MRI findings. *IJCRI* 2012;3:7–12
- 6 Bhatia V, Sarin SK. Hepatic visceral larva migrans: evolution of the lesion, diagnosis, and role of high-dose albendazole therapy. *Am J Gastroenterol* 1994;89(04):624–627