



ACUTE LEPTOSPIROSIS PRESENTING WITH PYOGENIC LIVER ABSCESS: A RARE ENTITY

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ABSTRACT

Leptospirosis is a spirochetal zoonotic infection caused by *Leptospira* species, with a significantly higher incidence in tropical and subtropical regions. Globally, an estimated 1.03 million cases occur annually, with an incidence of 14.8–15 per 100,000 population and approximately 58,900 deaths each year. Humans acquire infection through abraded skin, intact mucosa, or waterlogged skin following exposure to water, soil, or mud contaminated with urine of infected animals, with an incubation period of 5–14 days. Clinical manifestations range from subclinical illness to severe multiorgan dysfunction, including Weil's disease characterized by hepatic and renal failure. Although hepatic involvement is common, liver abscess formation is rarely reported. We report a rare coexistence of leptospirosis with liver abscess in a 19-year-old male from an urban background with pet animal exposure that is owning a pet animal shop with Cats, Dog, Rabbit and non-venomous Royal Ball Python which is suspected cause of infection in case when compared with other similar studies worldwide, who presented with high-grade fever, vomiting, right upper abdominal pain, headache, and myalgia of ten days' duration. Examination revealed pallor, icterus, shock, and right hypochondrial tenderness. Investigations showed neutrophilic leucocytosis, hyperbilirubinemia with mild transaminitis, elevated inflammatory markers, and acute kidney injury. Ultrasonography and contrast-enhanced CT abdomen revealed a solitary liver abscess in segments VII and VIII with mild splenomegaly. Initial tests for malaria, dengue, and typhoid were negative, and blood culture showed no growth. Despite empirical broad-spectrum antibiotics and abscess drainage, fever persisted. Serology revealed IgM positivity for *Leptospira*, following which doxycycline was added, leading to marked clinical and biochemical improvement with near-complete radiological resolution. Amoebic serology was negative. This case highlights the importance of considering leptospirosis in patients with liver abscess and persistent fever in endemic regions, emphasizing early diagnosis and targeted therapy to reduce morbidity.

KEYWORDS : *Leptospira*, Liver abscess, Leptospirosis

INTRODUCTION

The Spirochetal zoonosis caused by *Leptospira* species, Leptospirosis is a rare infectious disease.[1] The incidence of this disease is significantly higher in tropical and subtropical regions, when compared to temperate regions.[2] There are 1.03 million cases per year worldwide and 14.8–15 cases per 100,000 population per year globally with 58,900 deaths annually.[3] Humans are contaminated through cuts and abrasions of the skin, intact mucous membranes and waterlogged skin, within typical incubation period of 5-14 days, the infection is primarily transmitted through direct contact with water, mud, or soil contaminated with the urine of chronically infected mammals and rodents.[2] The spirochetes proliferate in the bloodstream of humans and then disseminate Hematogenously, exhibiting a range of clinical manifestations, ranging from mild to severe disease patterns [2,4] The manifestations also range from subclinical or self-limiting anicteric illness to severe disease with multiorgan failure and death, with the severe form (Weil's disease) characterized by renal and hepatic failure.[1] Infection in humans are characterised with acute hepatitis, enlargement and lesions in the liver, liver damage and acute hepatic failure, with a very few descriptions in the literature worldwide of an association between leptospirosis and formation of abscesses, this case adding one more to them.

CASE REPORT

A 19-year-old male from an urban background, with a history of close contact with pet animal exposure that is owning a pet animal shop with Cats, Dog, Rabbit and non-venomous Royal Ball Python which is suspected cause of infection in case when

compared with other similar studies worldwide and the possibility should be considered of captive snakes serving as a serious source of leptospiral infection in humans.[5,6] He presented to the casualty with complaints of high-grade fever, vomiting, dull aching pain in the right upper abdomen, headache, and myalgia for ten days. There was no history of diarrhoea, rash, recent travel, or drug intake. On examination, the patient was conscious and oriented, with pallor and icterus. He was febrile (104°F), tachycardic (110 beats/min), and hypotensive with a systolic blood pressure of 60 mmHg. Abdominal examination revealed localized tenderness in the right hypochondrium. Laboratory investigations showed leucocytosis (19,000/ μ L) with neutrophilic predominance (88%). Platelet count was 4.01×10^5 / μ L. Liver function tests revealed mildly elevated transaminases (AST 114 U/L, ALT 180 U/L) with hyperbilirubinemia (total bilirubin 4.0 mg/dL, indirect bilirubin 3.0 mg/dL). Inflammatory markers were raised (CRP 90 mg/L). Renal parameters showed serum urea of 36 mg/dL and creatinine of 2 mg/dL. Serum electrolytes were within normal limits. Serum amylase, lipase, and alkaline phosphatase levels were normal. Initial workup for acute febrile illnesses, including malarial parasite smear, dengue serology, and IgM Typhoid, were negative. Blood culture obtained at admission showed no growth. Chest radiograph and urine examination were unremarkable. Ultrasonography of the abdomen revealed a solitary liver abscess in the right lobe measuring 4 cm with an approximate volume of 8 cc, along with mild splenomegaly. Contrast-enhanced CT scan of the abdomen demonstrated hypodense lesions in segments VII and VIII of the liver. The patient was empirically started on intravenous piperacillin–tazobactam

and metronidazole, with dose adjustments based on hepatic and renal function. Percutaneous ultrasound-guided drainage of the abscess was performed without complications. Although abdominal pain improved significantly within two days of therapy, fever persisted, prompting further evaluation. Serological tests for scrub typhus and leptospirosis were sent, and IgM antibodies against *Leptospira* were found to be positive. Intravenous doxycycline was subsequently added to the treatment regimen. Following targeted therapy, the patient showed marked clinical improvement with gradual normalization of liver and renal function parameters. Repeat ultrasonography on day 12 revealed near-complete resolution of the liver abscess. Amoebic serology was negative. The patient completed 15 days of therapy and was discharged in stable condition, with complete recovery on follow-up. Both leptospirosis and liver abscess are frequently encountered in tropical regions; however, their coexistence is uncommon. This case highlights the importance of considering leptospirosis as an underlying etiology in patients presenting with liver abscess and persistent fever, especially in endemic areas and surveillance essential to study, prevent and control the disease in breeding centers and serpentariums



Figure 1 : Pet snake

DISCUSSION

Leptospirosis is an important but frequently underdiagnosed zoonotic infection in India, particularly in tropical and monsoon-prone regions. The disease exhibits a broad clinical spectrum, ranging from mild febrile illness to severe multiorgan dysfunction involving the liver, kidneys, and lungs. Hepatic involvement is common and typically manifests as disproportionate hyperbilirubinemia with mild to moderate elevation of transaminases, a feature that helps differentiate leptospirosis from viral hepatitis [7] Indian published studies have reported that delayed diagnosis is common due to overlap with other endemic acute febrile illnesses such as dengue, malaria, and scrub typhus [8,9]. Severe leptospirosis in Indian patients has been associated with renal failure, jaundice, shock, and increased mortality, especially among those requiring intensive care management. [8] Although hepatic dysfunction is frequently observed, focal hepatobiliary complications are rare. Pyogenic liver abscess is usually caused by enteric gram-negative bacilli and is commonly associated with biliary tract disease or portal spread [10]. The coexistence of pyogenic liver abscess with leptospirosis has been rarely reported from India. A case reported from Uttar Pradesh suggests either simultaneous community-acquired infections or transient immune

dysregulation during acute leptospiral illness predisposing to secondary bacterial infection [11]. Given the limited availability of culture and molecular diagnostic methods in most Indian healthcare settings, diagnosis largely relies on serological assays such as IgM ELISA in conjunction with clinical suspicion. Early initiation of appropriate antimicrobial therapy remains crucial for reducing morbidity and preventing progression to severe disease. In endemic regions, leptospirosis should be actively considered in patients presenting with acute febrile illness and unexplained hepatic or renal dysfunction, particularly when the clinical response to standard therapy is inadequate. Further studies are recommended to assess the causality of this very rare association.

Author Declaration

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Patient Consent: Informed consent was obtained from the patient's guardian for publication.

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