



LEPTOSPIROSIS AND LIVER ABSCESS: AN UNUSUAL ASSOCIATION

Pedro Ribeirinho-Soares^{1,2}, Miguel Souto³, Jorge Almeida¹

¹ Department of Internal Medicine, University Hospital Center of São João, E.P.E., Porto, Portugal

² Medicine Department, Faculty of Medicine of the University of Porto, Porto, Portugal

³ Clinical Pharmacology Unit, University Hospital Center of São João, E.P.E., Porto, Portugal

Corresponding author: Pedro Ribeirinho-Soares **e-mail:** jpedroarsoares@gmail.com

Received: 23/01/2023 **Accepted:** 31/01/2023 **Published:** 28/02/2023

Conflicts of Interests: The Authors declare that there are no competing interests.
This article is licensed under a **Commons Attribution Non-Commercial 4.0 License**

How to cite this article: Ribeirinho-Soares P, Souto M, Almeida J. Leptospirosis and liver abscess: an unusual association. *EJCRIM* 2023;**10**:doi:10.12890/2023_003783.

ABSTRACT

Leptospirosis is a zoonotic infection infrequently reported in non-tropical regions. Although classically described as a biphasic illness, unusual clinical manifestations have been reported, including a previous case of a lung abscess associated with this causative agent. We present the case of a 49-year-old man with a new diagnosis of two liver abscesses associated with leptospirosis.

KEYWORDS

Leptospirosis, zoonosis, liver abscess

LEARNING POINTS

- Leptospirosis is a zoonosis caused by spirochetes of the genus *Leptospira*; the infection is more commonly reported in tropical regions.
- Leptospirosis classically manifests as a biphasic illness, the first phase characterized by high fever that coincides with leptospiraemia, followed by a brief period when the patient is afebrile. In the second phase, fever returns, accompanied by jaundice and renal failure.
- The unusual clinical manifestations of leptospirosis include a previous report of a lung abscess, but despite frequent liver involvement, liver abscess in this context has not previously been described.



INTRODUCTION

Leptospirosis is a widespread zoonosis caused by pathogenic spirochetes of the genus *Leptospira*. It spreads to humans through contaminated water or soil or direct exposure to the infected urine of carrier mammals^[1]. The severity of infection ranges widely from subclinical illness to Weil's disease, a severe icterohaemorrhagic form characterized by jaundice, splenomegaly and nephritis^[2]. Worldwide, leptospirosis is the leading zoonotic cause of morbidity and mortality with more than 1 million cases reported annually^[3].

Liver involvement is common in leptospirosis^[4,5]. Infection in humans has been linked to acute hepatitis, enlargement of and lesions in the liver, liver damage and acute hepatic failure^[6-8]. There are very few descriptions in the literature of an association between leptospirosis and the formation of abscesses, with one previous report describing a related lung abscess^[9]. A recent report of acute leptospirosis and pyogenic liver abscess has increased awareness of this rare co-occurrence^[10].

CASE DESCRIPTION

The patient was a 49-year-old man without a relevant medical history. He lived in an urban area and reported no contact with domestic animals, livestock or wildlife. He denied consumption of uncooked meat or fish in the previous month and only drank bottled water.

He was admitted to the emergency department (ED) with complaints of a 7-day history of fever (maximum axillary temperature: 39°C), accompanied by bifrontal headache, myalgia and nausea. He denied abdominal pain, diarrhoea, cough, dyspnoea, rashes and arthralgias. He noted that the symptoms had started after an off-path walk he had undertaken the week before. At admission, he was febrile (38.8°C), haemodynamically stable (blood pressure of 126/78 mmHg, pulse of 79 bpm) and normoglycaemic; peripheral oxygen saturation was 98% on room air without signs of respiratory distress. Abdominal examination revealed tenderness in the right upper quadrant; no masses were palpable and no signs of peritoneal irritation were present.

Blood tests revealed mild transaminase elevation and cholestasis (twice the upper limit of normal) with a marked increase in C-reactive protein (215 mg/l). No leucocytosis was noted and the bilirubin level was normal. An abdominal ultrasound was performed and revealed a lesion measuring 5 cm in the left hepatic lobe. The patient was admitted to the Internal Medicine ward for further examination.

The patient underwent a triphasic dynamic contrast-enhanced abdominopelvic CT scan that revealed two hypodense lesions in segment IVa of the liver, compatible with hepatic abscesses (Fig. 1). Empiric broad-spectrum parenteral antibiotics were started with ceftriaxone plus metronidazole, and percutaneous drainage of the liver abscesses was performed.

A diagnosis of leptospirosis was considered. A polymerase chain reaction test for leptospiral DNA in the blood was



Figure 1. Abdominopelvic CT scan revealing two lesions in segment IVa of the liver, suggestive of the presence of hepatic abscesses

positive. Blood cultures for aerobic and anaerobic bacteria were negative; serologies for other zoonotic agents and hepatotropic viruses were also negative. HIV serology was negative. The patient underwent a colonoscopy that was unremarkable.

After drainage of the hepatic abscesses, the patient underwent 2 weeks of parenteral therapy and then 4 weeks of oral doxycycline. Resolution of the abscesses was noted in subsequent ambulatory reassessment; no other complications were noted.

DISCUSSION

Liver abscess is a rare entity that is fatal if left untreated. It is most common in the fifth decade of life, and early recognition and intervention are key to successful treatment and a better prognosis^[11]. In North America, the annual incidence of liver abscess has been estimated to be 2.3 cases per 100,000 people and is higher among men than women (3.3 versus 1.3 per 100,000)^[12]. However, the true incidence may be underestimated due to the diverse clinical manifestations, which are often subtle, requiring high clinical suspicion. Owing to its dual blood supply, the liver is particularly vulnerable to the formation of pyogenic liver abscesses,

which can result from: (i) bacterial dissemination by the hepatic artery (disseminated sepsis); (ii) spread through the portal vein (gastrointestinal infection); (iii) ascending cholangitis; (iv) continuity from the peritoneal cavity; and (v) necrosis of infected tissue^[11]. Drainage of liver abscesses is strongly recommended when practical and feasible because of the diagnostic and therapeutic implications. Simple aspiration may be sufficient for small abscesses but, where possible, placement of a drainage catheter is preferred^[13,14]. Leptospirosis is a worldwide zoonotic infection, more commonly reported in tropical regions. Animals, particularly rodents, are the primary vectors of the disease. Human infection results from exposure to the urine of infected animals or through contact with contaminated soil or water^[15]. The diagnosis is challenging due to the variable clinical symptoms and mimicry of common diseases such as viral hepatitis.

To the best of our knowledge, the co-occurrence of leptospirosis and liver abscess has not previously been reported in Europe. Additionally, *Leptospira* has not been mentioned in the literature as an aetiological agent or predisposing condition for the development of liver abscess. Further studies are warranted to assess the causality of this very rare association.

14. Kulhari M, Mandia R. Prospective randomized comparative study of pigtail catheter drainage versus percutaneous needle aspiration in treatment of liver abscess. *ANZ J Surg* 2019;**89**(3):E81–E86.
15. Wysocki J, Liu Y, Shores N. Leptospirosis with acute liver injury. *Proc (Bayl Univ Med Cent)* 2014 Jul;**27**(3):257–258.

REFERENCES

1. Chaikajornwat J, Rattanajajaroen P, Srisawat N, Kawkitinarong K. Leptospirosis manifested with severe pulmonary haemorrhagic syndrome successfully treated with venovenous extracorporeal membrane oxygenation. *BMJ Case Rep* 2020;**13**:e230075.
2. Alvarado-Esquivel C, Sánchez-Anguiano LF, Hernández-Tinoco J, Ramos-Neuárez A, Margarita Cerrillo-Soto S, Alberto Guido-Arreola C. Leptospira exposure and patients with liver diseases: a case-control seroprevalence study. *Int J Biomed Sci* 2016 Jun;**12**(2):48–52.
3. Costa F, Hagan JE, Calcagno J, Kane M, Torgerson P, Martinez-Silveira MS, et al. Global morbidity and mortality of leptospirosis: a systematic review. *PLoS Negl Trop Dis* 2015 Sep 17;**9**(9):e0003898.
4. Abgueguen P, Pichard E. Leptospirosis. *Rev Prat* 2009;**59**(5):665–673.
5. Ciceroni L, Stepan E, Pinto A, Pizzocaro P, Dettori G, Franzin L, et al. Epidemiological trend of human leptospirosis in Italy between 1994 and 1996. *Eur J Epidemiol* 2000;**16**(1):79–86.
6. Granito A, Ballardini G, Fusconi M, Volta U, Muratori P, Sambri V, et al. A case of leptospirosis simulating colon cancer with liver metastases. *World J Gastroenterol* 2004;**10**(16):2455–2456.
7. Kozielwicz D, Karwowska K, Halota W. Leptospirosis--disease with many faces. *Pol Merkur Lekarski* 2013;**35**(209):279–282.
8. Shintaku M, Itoh H, Tsutsumi Y. Weil's disease (leptospirosis) manifesting as fulminant hepatic failure: report of an autopsy case. *Pathol Res Pract* 2014;**210**(12):1134–1137.
9. Winter RJ, Richardson A, Lehner MJ, Hoffbrand BI. Lung abscess and reactive arthritis: rare complications of leptospirosis. *Br Med J (Clin Res Ed)* 1984;**288**:448–449.
10. Khanna P, Khanna A. Pyogenic liver abscess and acute leptospirosis: a rare coexistence. *J Family Med Prim Care* 2022 Sep;**11**(9):5716–5717.
11. Sotto Mayor J, Robalo MM, Pacheco AP, Esperança S. Pyogenic liver abscess: uncommon presentation. *BMJ Case Rep* 11;**2016**:bcr2016214841.
12. Kaplan GG, Gregson DB, Laupland KB. Population-based study of the epidemiology of and the risk factors for pyogenic liver abscess. *Clin Gastroenterol Hepatol* 2004;**2**(11):1032.
13. Ahmed M, Alam J, Hussain S, Aslam M. Prospective randomized comparative study of percutaneous catheter drainage and percutaneous needle aspiration in the treatment of liver abscess. *ANZ J Surg* 2021;**91**(3):E86.