https://doi.org/10.22516/25007440.1080

Case report

Biliary Obstructive Syndrome as an Atypical Manifestation of Weil's Disease: A Case Series

María Paula Forero-Ríos,[1*] Diego Fernando Salcedo-Miranda,[2] Fabián E. Puentes-M.,[3] Diego Alejandro Dussán,[4] Mauricio Martínez-Ramírez.[5]

OPEN ACCESS

Citation:
Forero-Ríos MP, Salcedo-Miranda DF, Puentes F, Dussán DA, Martínez-Ramírez M. Biliary Obstructive Syndrome as an Atypical Manifestation of Weil's Disease: A Case Series. Revista. colomb. Gastroenterol. 2024;39(1):112-116. https://doi.org/10.22516/25007440.1080

[1] Physician, Universidad El Bosque. Research Assistant, Pontificia Universidad Javeriana. Bogotá, Colombia.
[2] Physician, Thoracic Surgery Fellow, Universidad El Bosque. Bogotá, Colombia.
[3] Clinical-Surgical Gastroenterologist, Universidad de Caldas, Unión de Cirujanos. Manizales, Colombia.
[4] Specialist in General Surgery, Clinical-Surgical Gastroenterology Fellow, Universidad de Caldas. Manizales, Colombia.
[5] Physician, Universidad El Bosque. Bogotá, Colombia.

***Correspondence:** María Paula Forero-Ríos.
mpauforero@hotmail.com

Received: 06/05/2023
Accepted: 04/10/2023

Abstract

Leptospirosis is a systemic zoonotic infection transmitted through the skin, mucous membranes, or ingestion of water contaminated with pathogenic spirochetes of the genus *Leptospira* in infected mammals and rodents. It appears with nonspecific symptoms of acute onset associated with abdominal pain, subconjunctival hemorrhage, and jaundice, which usually has complete resolution in the majority of patients. However, in a lower percentage, it can progress, causing severe systemic complications, with a high risk of mortality mainly due to acute kidney failure, liver dysfunction associated with jaundice, and hemorrhages, called *Weil syndrome* or *icterohemorrhagic fever*.

We present a series of cases of patients with biliary obstruction as the primary manifestation of severe leptospirosis.

Keywords

Weil's disease, leptospirosis, choledocholithiasis.

INTRODUCTION

The infection by leptospira in humans is transmitted through direct contact with mucous membranes and, to a lesser extent, through the skin, as well as indirectly by the consumption of water contaminated by pathogenic spirochetes. These spirochetes originate from infected mammals and rodents, predominantly dogs, cattle, and rodents, placing individuals living in poverty and those with a high risk of occupational exposure, such as farmers, agricultural workers, and ranchers, including those involved in sewer cleaning, at increased risk.(1)

The nonspecific nature of its symptoms complicates and delays diagnosis, often presenting with flu-like symptoms, neurological changes, and conjunctival hyperemia. This condition usually resolves in 90% of patients. However, in a minority of cases, it can lead to serious complications, such as acute nephropathy, hepatic dysfunction, and hemorrhages, known collectively as Weil's disease, which is associated with a high mortality rate.

This article presents a series of three patients who exhibited obstructive biliary syndrome as the primary manifestation of Weil's disease.

CASE REPORTS

Case 1

A 42-year-old female patient with a history of alcoholic cirrhosis, working as a street vendor near sewer drains, presented with an eight-day history of polyarticular pain, jaundice, and neurological alterations including paraparesis and severe headaches, accompanied by tachycardia and upper hemiabdominal pain with palpable hepatosplenomegaly, but no signs of peritoneal irritation.

Initial laboratory tests revealed hemoglobin at 9 g/dL, leukocytes at 12,430, neutrophils at 90.8%, platelets at 21,000 μL, creatinine at 1.2 mg/dL, ALT at 90 U/L, AST at 74 U/L, and significant hyperbilirubinemia with a total bilirubin of 29 mg/dL, primarily due to direct bilirubin at 18 mg/dL. An abdominal ultrasound suggested cholelithiasis and choledocholithiasis without cholecystitis, leading to an endoscopic retrograde cholangiopancreatography (ERCP) with removal of a stone from the distal bile duct. After symptomatic improvement, the patient was discharged.

Fourteen days later, the patient returned with myalgias, encephalopathy, and jaundice. A follow-up abdominal ultrasound showed slight dilation of the intra- and extrahepatic bile ducts, highly suggestive of choledocholithiasis necessitating ERCP, which the patient declined.

Given the patient's occupational exposure and clinical presentation of recurrent obstructive biliary syndrome, an infectious disease consultation was sought. Leptospirosis was suspected, prompting the request for leptospira immunoglobulin M (IgM), which tested positive. However, during her hospital stay, she developed acute kidney injury with creatinine at 3.01 mg/dL and blood urea nitrogen (BUN) at 74.2 m/dL, alongside abdominal pain and hemorrhaging. An upper gastrointestinal endoscopy revealed acute gastropathy. Due to her hemodynamic instability, an emergency exploratory laparotomy was performed, revealing 4000 mL of citrine fluid in the cavity and a cirrhotic liver with multiple nodules, with no other pathological surgical findings. Despite these interventions, the patient's hemodynamic instability persisted, leading to her death in the immediate postoperative period.

Case 2

This case involves a 39-year-old male patient, a migrant with a prior diagnosis of cholelithiasis, who is employed as a grocer. He sought medical attention due to a week-long history of abdominal pain, which was accompanied by diarrheal stools, episodes of vomiting, and intermittent fever spikes.

At the time of admission, the patient was found to be hemodynamically unstable and exhibited jaundice. There was noted pain upon palpation in the right hypochondrial region, though no signs of peritoneal irritation were evident. Laboratory results at admission highlighted leukocytosis with a white blood cell count of 15,200, neutrophils constituting 89%, a platelet count of 25,000 μL, acute kidney injury evidenced by a creatinine level of 2.5 mg/dL and a BUN level of 60.8 m/dL. Liver function tests revealed an ALT of 84 U/L, AST of 70 U/L, and hyperbilirubinemia with a total bilirubin of 25 mg/dL, of which direct bilirubin comprised 10 mg/dL. An abdominal ultrasound suggested the presence of cholelithiasis and acute cholecystitis, with a moderate suspicion of choledocholithiasis. The patient subsequently developed septic shock attributed to a biliary origin, necessitating initiation of vasopressor support, fluid resuscitation, and antibiotic therapy in the intensive care unit (ICU). Renal replacement therapy was also planned.

Given the suspicion of cholangitis, an ERCP was performed. The procedure identified a bile duct dilation of 7 mm without internal calculi, but abundant biliary sludge and no filling defects were observed. Following an improvement in the infectious condition, the decision was made to proceed with a laparoscopic cholecystectomy, considering the possibility of intraoperative cholangiography or exploration of the bile duct due to the suspicion of a residual bile duct stone. Attempts to cannulate the cystic duct with a Nelaton catheter were unsuccessful, leading to a conversion to laparotomy. A fundocystic cholecystectomy was performed, and the cystic duct was successfully cannulated without the extraction of pus.

Despite these interventions, the patient continued to exhibit leukocytosis and mixed hyperbilirubinemia. This led to a reevaluation of potential underlying causes. The patient disclosed consumption of food prior to symptom onset, which he described as having a "rat-like smell", prompting the request for leptospira antibodies testing, which returned positive. The infectious diseases team recommended an antibiotic regimen of ceftriaxone 2 g/day for seven days. The patient showed a favorable response, culminating in the resolution of hyperbilirubinemia. Following the completion of antibiotic therapy, the patient was discharged from the hospital.

Case 3

A 41-year-old male with no significant medical history, employed in agriculture, presented with symptoms persisting for five days, including polyarticular pain, vomiting, headache, and abdominal discomfort.

At the time of hospital admission, the patient was found to be hemodynamically stable. Examination revealed localized abdominal tenderness in the upper right quadrant, but no signs indicative of peritoneal irritation were obser-

ved. Laboratory analysis showed hemoglobin at 10.7 g/dL, a leukocyte count of 28,540 with 90.8% neutrophils, platelets at 21,000 µL, creatinine at 3.41 mg/dL, BUN at 67.8 m/dL, AST at 82.6 U/L, ALT at 105.9 U/L, total bilirubin at 41.36 mg/dL, and direct bilirubin at 34.2 mg/dL.

Due to a decline in his overall health, the patient was transferred to the ICU for further management. A comprehensive abdominal ultrasound revealed cholelithiasis, acute cholecystitis, and choledocholithiasis, leading to a diagnosis of abdominal sepsis secondary to Tokyo III classified cholangitis.

The patient underwent an exploratory laparotomy, including cholecystectomy and bile duct exploration with T-tube and Jackson-Pratt drain placement. Surgical findings were notable for minimal ascitic fluid, edematous gallbladder, and cholelithiasis, without evidence of cholecystitis or bile duct stones. Intraoperative cholangiography did not identify any filling defects.

In light of his clinical instability and ambiguous symptomatology, a series of tests were conducted to identify possible infectious causes, effectively ruling out human immunodeficiency virus (HIV), syphilis, hepatitis B, hepatitis C, and cytomegalovirus. The patient exhibited coagulation abnormalities and continued thrombocytopenia, accompanied by bleeding from the surgical drain, necessitating a subsequent surgical intervention for hepatoduodenal ligament ligation.

Subsequent testing for IgM antibodies against leptospira returned positive, prompting the initiation of a targeted antibiotic regimen with ceftriaxone 2 g/day for seven days. This treatment led to a notable improvement in the patient's condition, culminating in his discharge from the hospital.

DISCUSSION

Leptospirosis is recognized as a zoonotic disease prevalent in both urban and rural settings, caused by the infection of spirochetes belonging to the genus *Leptospira*. This disease affects mammals and rodents[2], leading to epidemic or seasonal outbreaks[3]. Transmission occurs through direct contact with contaminated animal skin, mucous membranes, or bodily fluids, or indirectly through the ingestion of water tainted by infected animals[4]. It predominantly affects individuals in low-income areas, those lacking proper sanitation, individuals working in sewage systems, and those engaged in agricultural activities[1].

The clinical presentation of leptospirosis is notably nonspecific and varies depending on several factors, including the tropism of the causative agent, the stage of the disease, and the overall health condition of the patient. Approximately 90% of cases are either mild or anicteric, displaying nonspecific symptoms similar to those of various other febrile illnesses, hemorrhagic fevers, dengue, or bacterial infections[5]. Most of these cases resolve spontaneously without intervention[6]. In contrast, a smaller proportion of cases manifest in an icteric form, featuring conjunctival suffusion and acute kidney injury[7]. These cases tend to have more severe outcomes and may also present as Weil's disease or icterohemorrhagic fever, which are characterized by significant severity and high mortality rates[8].

Jaundice in leptospirosis results from hyperbilirubinemia and elevated liver enzyme levels, accompanied by acute nephropathy characterized by proteinuria, azotemia, pyuria, hematuria, anuria, and bleeding manifestations[9], including hemoptysis, hematochezia, hematuria, and predominantly purpuric lesions. Although jaundice due to hepatocellular dysfunction is a frequent manifestation of this infection, the development of obstructive biliary syndrome as a consequence is remarkably rare.

For patients confirmed with or suspected of having leptospirosis or Weil's disease, it is essential to assess their condition to determine the appropriate management strategy. In the first scenario, where the patient is clinically stable with mild or anicteric symptoms and no underlying comorbidities, outpatient treatment with doxycycline for seven days is recommended, alongside strict outpatient monitoring of symptoms. In the second scenario, where the patient exhibits clinical instability, generalized jaundice, oliguria, hematuria, or signs of respiratory distress, hospitalization is advised. This includes conducting a complete blood count, C-reactive protein test, renal and liver function tests, strict fluid balance monitoring, and starting antimicrobial therapy with intravenous ceftriaxone for seven days, coupled with goal-directed fluid resuscitation. Critically ill patients should be managed in an ICU setting[5].

Diagnosis of leptospirosis is primarily achieved through serological testing and isolation[4,10]. The microscopic agglutination test, performed under a dark-field microscope, is considered the reference serological test. In this test, antibodies from the patient's serum agglutinate live leptospira from a selection of reference serovars representative of the major pathogenic serogroups. A diagnosis is confirmed by seroconversion or a fourfold increase in the antibody titers from the convalescent phase sample compared to the acute phase sample[6,11].

Other serological methods include the detection of IgM antibodies through enzyme-linked immunosorbent assay (ELISA), typically negative in the first five days of illness. This test generally becomes positive before microscopic agglutination within the first four days following symptom onset[8,12].

In the first case, a patient with rodent exposure developed nonspecific symptoms and obstructive biliary syndrome, leading to the removal of multiple stones from the distal

common bile duct via ERCP due to choledocholithiasis. Unfortunately, she was diagnosed with leptospirosis only after developing acute kidney injury and gastrointestinal bleeding. Combined with her hemodynamic instability, this led to her death. This outcome contrasts with that of the second and third patients, who also experienced nonspecific symptoms, acute kidney injury, and obstructive biliary syndrome necessitating endoscopic and surgical intervention but without initial symptom improvement. However, through detailed reassessment of exposure factors and comprehensive diagnostic evaluations, they were timely diagnosed with leptospirosis and received targeted antibiotic therapy, resulting in satisfactory clinical improvement.

The third case highlights a patient from a rural area in the department of Caldas, employed as a farmer, who was admitted presenting general malaise, asthenia, adynamia, headache, and abdominal pain. Imaging findings supported a diagnosis of acute cholecystitis with significant risk for choledocholithiasis. Given the patient's hemodynamic instability and meeting the criteria for sepsis, surgical intervention was imperative, culminating in cholecystectomy and exploration of the biliary tract. Notably, cholangitis was excluded during this exploratory procedure. Subsequently, the patient was transferred to the intensive care unit for comprehensive supportive management and resuscitation measures. A comprehensive array of paraclinical studies ensued, leading to the definitive diagnosis of leptospirosis. Consequently, tailored antibiotic therapy, overseen by the infectious diseases service, was initiated, yielding resolution of both respiratory and renal insufficiencies, indicative of favorable patient prognosis.

To date, Colombia has not reported any cases of leptospirosis manifesting as obstructive biliary syndrome. Available literature describes mild to severe forms of leptospirosis across various regions. According to the World Health Organization (WHO), the Americas report an incidence of 12.5 cases per 100,000 inhabitants, with Brazil, Peru, and Nicaragua experiencing higher frequencies[13]. The initial documentation of severe human leptospirosis in Colombia dates back to 1966[2], with the first urban epidemic of severe leptospirosis reported in Barranquilla, Colombia, in 1995, amidst flooding.

Colombia has conducted multiple studies and reports concerning leptospira infection. An early study in the Atlántico department (1995-2004) found 8.6% of cases developed Weil's disease, albeit with no fatalities[3]. Another study in Barranquilla (2007-2009) reported 6.3% of cases as Weil's disease, including one presumed death from the condition[3]. A further study in the Quindío department (2005-2006) identified four presumed deaths due to Weil's disease.

CONCLUSIONS

Leptospirosis symptoms are inherently nonspecific and heavily dependent on the disease stage. Obstructive biliary syndrome in the context of advanced stages, such as Weil's disease, remains exceedingly rare. The scant literature and lack of reported cases in Colombia highlight the diagnostic challenges this presents to gastroenterologists and general surgeons.

Conflict of Interest

No conflicts of interest were declared in relation to this study.

REFERENCES

1. Instituto Nacional de Salud. Módulo técnico para leptospirosis [Internet]. INS [consultado el 22 de agosto de 2021]. Disponible en: https://www.ins.gov.co/buscador-eventos/Lineamientos/Pro_Leptospirosis.pdf
2. Vinetz JM. Leptospirosis. Curr Opin Infect Dis. 2001;14(5):527-38. https://doi.org/10.1097/00001432-200110000-00005
3. Alfaro Mora R. Leptospirosis en Costa Rica. Técnicas diagnósticas y su tratamiento. Rev Enf Emerg. 2017;16(1):23-29.
4. Wang S, Stobart Gallagher MA, Dunn N. Leptospirosis. [Updated 2021 Aug 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-.
5. Rajapakse S. Leptospirosis: clinical aspects. Clin Med (Lond). 2022;22(1):14-17. https://doi.org/10.7861/clinmed.2021-0784
6. Wagenaar JFP, Goris MGA. Leptospirosis. En: Kasper DL, Loscalzo J, Fauci AS, Hauser SL, Longo DL, Jameson JL (editores). Harrison principios de la medicina interna. Vol. 2. 19.ª edición. México: McGraw-Hill; 2016. p. 1140-1145.
7. Haake DA, Levett PN. Leptospirosis in humans. Curr Top Microbiol Immunol. 2015;387:65-97. https://doi.org/10.1007/978-3-662-45059-8_5
8. Garrido R, Castillo L, Hernández G, Abarca J, Montes JM, Monsalve V, et al. Systemic leptospirosis as a cause of multiple organ failure. Report of a case. Rev Med Chil. 1996;124(3):359-62.
9. Farrar EW. Especies de Leptospira (Leptospirosis). En: Mandell G; Gordon R; Bennett J (editores). Enfermedades Infecciosas: principios y práctica. 4.ª edición. Elsevier; 1995. p. 2396-2400.

10. Sánchez Vallejo G, Gómez Marín JE, Quintero Álvarez L, Castaño Cotrina MC. Características clínicas y epidemiológicas de la leptospirosis en el departamento del Quindío, 2005-2006. Infectio. 2008;12(2):325-31.
11. Levett PN. Leptospirosis. Clin Microbiol 2001;14(2):296-326. https://doi.org/10.1128/CMR.14.2.296-326.2001
12. Bharti AR, Nally JE, Ricaldi JN, Matthias MA, Diaz MM, Lovett MA, et al. Leptospirosis: a zoonotic disease of global importance. Lancet Infect Dis. 2003;3(12):757-71. https://doi.org/10.1016/S1473-3099(03)00830-2
13. Romero C, Falconar A. Leptospira spp. Y leptospirosis humana. Salud Uninorte. Barranquilla (Col). 2016;32(1):123-143. https://doi.org/10.14482/sun.32.1.8479

María Paula Forero-Ríos, Diego Fernando Salcedo-Miranda, Fabián E. Puentes-M., Diego Alejandro Dussán, Mauricio Martínez-Ramírez

Biliary Obstructive Syndrome as an Atypical Manifestation of Weil's Disease: A Case Series
Síndrome biliar obstructivo como manifestación atípica de la enfermedad de Weil: una serie de casos

Revista colombiana de Gastroenterología
vol. 39, no. 1, p. 112 - 116, 2024
Asociación Colombiana de Gastroenterología,
ISSN: 0120-9957
ISSN-E: 2500-7440

DOI: https://doi.org/10.22516/25007440.1080