Absceso hepático y bacteriemia causada por Desulfovibrio Desulfuricans

Bacteraemia and Hepatic Abscess caused by Desulfovibrio Desulfuricans

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ABSTRACT

This case report presents a rare occurrence of a liver abscess caused by *Desulfovibrio desulfuricans* bacteremia in an elderly Indian patient. While liver abscesses are commonly caused by gram-negative bacilli, *Desulfovibrio spp.* are rarely reported as causative agents.

The patient had multiple comorbidities and presented with general malaise, asthenia associated with decreased appetite, and diarrhea. CT scan confirmed the presence of liver abscesses and blood cultures identified *Desulfovibrio desulfuricans* as the causative agent. Treatment involved percutaneous drainage of the abscesses and a 6-week course of antibiotics with metronidazole initially and then with amoxicillin/clavulanic acid. Clinical improvement was achieved, and subsequent negative haemocultures and imaging control indicated the effectiveness of the treatment. However, the patient's condition deteriorated due to respiratory failure caused by COVID-19, highlighting the impact of underlying comorbidities.

The rarity of *Desulfovibrio desulfuricans* infections in Portugal further emphasizes the significance of this case. It raises questions about the potential influence of ethnicity and geography on susceptibility to such infections, warranting further research.

Keywords: hepatic abscess, bacteraemia, desulfovibrio, Portugal, metronidazole.

RESUMEN

Este caso clínico presenta un caso poco frecuente de absceso hepático causado por bacteriemia por *Desulfovibrio desulfuricans* en un paciente indio de edad avanzada. Aunque los abscesos hepáticos suelen estar causados por bacilos gramnegativos, rara vez se ha descrito la presencia de *Desulfovibrio spp.* como agente causal.

El paciente tenía múltiples comorbilidades y presentaba malestar general, astenia asociada a disminución del apetito y diarrea. La TC confirmó la presencia de abscesos hepáticos y los hemocultivos identificaron *Desulfovibrio desulfuricans* como agente causal. El tratamiento consistió en el drenaje percutáneo de los abscesos y un ciclo de 6 semanas de antibióticos con metronidazol inicialmente y luego con amoxicilina/ácido clavulánico. Se consiguió una mejoría clínica, y los hemocultivos negativos posteriores y el control por imagen indicaron la eficacia del tratamiento. Sin embargo, el estado de la paciente se deterioró debido a una insuficiencia respiratoria causada por el COVID-19, lo que pone de manifiesto el impacto de las comorbilidades subyacentes.

La rareza de las infecciones por *Desulfovibrio desulfuricans* en Portugal subraya aún más la importancia de este caso. Plantea cuestiones sobre la posible influencia de la etnia y la geografía en la susceptibilidad a tales infecciones, lo que justifica nuevas investigaciones.

Palabras clave: absceso hepático, bacteriemia, desulfovibrio, Portugal, metronidazol.

INTRODUCTION

Desulfovibrio spp. is a group of gram-negative, anaerobic bacteria widely found in soil, water, and sewage. While certain species are considered normal inhabitants of the oral cavity and intestinal tract, they have also been associated with various infectious diseases, including periodontitis, brain abscesses, liver abscesses, and bacteraemia, although anaerobic bacteria account for less than 10% of positive blood cultures[1,2]. However, due to the limited number of reported cases, the clinical characteristics of these infections remain poorly understood.

In this report, we present a case of liver abscess caused by *Desulfovibrio desulfuricans* bacteraemia in an elderly patient.

CASE DESCRIPTION

We describe a case of an 83-year-old Indian female living in Portugal for 30 years, partially dependent (KATZ 2).

She was brought to emergency department for general malaise, increasing asthenia, and progressive prostration over the past three weeks. Furthermore, she had experienced decreased appetite and diarrhea during the two preceding weeks, and denied fever, decreased urine output, nausea, vomiting or recent antibiotics use. She has a history of hypertension, type 2 diabetes mellitus (DM), ischemic heart disease and atrial fibrillation (AF).

Upon admission to the emergency department, she appeared drowsy and non-collaborative. Her vital signs were SpO2 97%, temp 37.1°C, BP 157/89 mmHg, HR 97 bpm. The abdomen was slightly distended and mildly tender on deep right flank palpation. Laboratory tests showed severe microcytic hypochromic anemia, leucocytosis with neutrophilia, thrombocytosis, and increased C-reactive protein. Transaminases, alkaline phosphatase (AF) and total bilirubin (TB) were normal [Table 1]. Additional diagnostic investigations included an ultrasound that revealed left hepatic lobe enlargement with a complex cystic solid mass and a smaller lesion in right hepatic lobe.

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Table 1. Evolution of analyses, before and after treatment.

	BEFORE TREATMENT	AFTER TREATMENT	NORMAL RANGE
HB (G/DL)	7.7	10	[12.0 - 16.0]
MCV (FL)	60.5	79	[80 - 100]
MCH (PG)	19.4	23,6	[26 - 34]
Leukocytes (white blood cells/uL)	23,550	5,550	[3,600 - 11,000]
Neutrophils (neutrophils/uL)	21,410	3,390	[1,300 - 8,800]
Platelets (platelets/uL)	486,000	155,000	[150,000 - 440,000]
GOT (U/L)	15	25	[4 - 27]
GPT (U/L)	9	22	[4 - 34]
AF (U/L)	98	85	[35 - 104]
TB (mg/dL)	0.29	0.31	[0.1 - 1.1]
C-reactive protein (mg/dL)	15.33	0.75	[0 - 0.5]

Hb (haemoglobin), MCV (mean corpuscular volume), MCH (mean corpuscular haemoglobin), GOT (glutamic oxaloacetic transaminase), GPT (Glutamic pyruvic transaminase), AF (alkaline phosphatase), TB (total bilirubin).

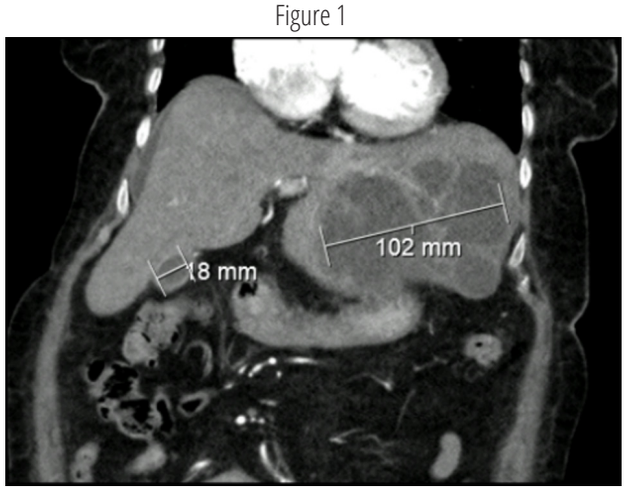
CT scan was then performed and showed a lobulated hypodense, hypovascular cystic lesions in left lobe, with internal septations and a 18 mm hypodense lesion in right lobe (Figure 1). Considered infectious or neoplastic lesion and further evaluation warranted. No other significant abnormalities were noted in the abdomen or elsewhere.

She was admitted to Internal Medicine ward, haemocultures were collected and ceftriaxone and metronidazole were started. Hepatic abscess percutaneous drainage was performed on 5th day. Haemocultures revealed *Desulfovibrio desulfuricans* presence but abscess pus bacteriological test returned negative. The isolated agent was sensitive to amoxicillin/clavulanic acid and resistant to ampicillin. Later metronidazole susceptibility test also showed sensitivity.

Two weeks later, follow-up ultrasound found residual loculated fluid, plus two more liquid collections. After discussion with radiology, no further drainage needed and the tube was removed three weeks later. Antibiotic treatment consisted of six weeks: five weeks of metronidazole and one week of amoxicillin/clavulanic acid (adjusted when antibiogram available). Haemocultures collected 4 weeks after the start of antibiotics returned negative results. The abdominal CT scan was repeated at the end of the antibiotic cycle and demonstrated abscesses fully resolved.

On the 29th day of hospitalization, the patient's condition deteriorated, presenting with increased prostration and respiratory failure. She tested positive for COVID-19. The patient's respiratory distress worsened, ultimately leading to her death due to respiratory failure on the 47th day of hospitalization. It is important to note that the patient's underlying comorbidities, such as advanced age, DM, and cardiovascular disease, likely contributed to the increased vulnerability and severity of the respiratory illness.

Figure 1



DISCUSSION

In this case report, we presented an uncommon occurrence of a liver abscess caused by *Desulfovibrio desulfuricans* bacteraemia in an elderly patient with multiple comorbidities. The clinical presentation of liver abscesses caused by *Desulfovibrio spp*. can be challenging to diagnose due to its nonspecific symptoms.

Notably, the absence of relevant epidemiological context, such as recent travel history or animal contact, makes the presence of this agent even more unlikely. This is particularly important since *Desulfovibrio spp*. are considered normal inhabitants of the oral cavity and intestinal tract[1,2], which may lead to the speculation of an endogenous source in this case. A literature review of previous cases of *Desulfuvibrio desulfuricans* bacteremia suggested that the pathogen was derived from bacterial translocation from the intestine in most cases.[3]

To the best of our knowledge, *Desulfovibrio desulfuricans* infections are rare in Portugal and few cases have been reported in this country. The lack of epidemiological data emphasizes the significance of this case, contributing to our understanding of the distribution and clinical characteristics of this pathogen in different geographic regions.

The patient's background as an Indian immigrant living in Portugal for 30 years raises questions about whether her ethnicity or long-term

residence in Portugal might have influenced her susceptibility to this infection. While some studies suggest certain populations may have variations in gut microbiota composition based on ethnicity and geography, further research is necessary to determine if these factors play a role in the susceptibility to *Desulfovibrio* infections.[4,5]

The liver abscess was successfully treated with percutaneous drainage and appropriate antibiotics. Although the drainage removed the purulent material, it didn't guide antibiotic selection due to negative results, possibly due to antibiotic initiation five days before drainage. However, initial hemocultures taken before antibiotics showed *Desulfovibrio desulfuricans* presence.

Empiric antibiotic therapy was initiated with metronidazole, following existing literature[1,3]. Due to *Desulfovibrio desulfuricans* fastidious nature, its culture growth and antibiotic susceptibility testing were delayed until the 34th day of treatment. Sensitivity was then shown only to amoxicillin-clavulanic acid and, despite 34 days of metronidazole treatment response, a switch to amoxicillin-clavulanate was made. Sensitivity to metronidazole was confirmed a week after completing the antibiotic course.

Although the liver abscess was initially managed successfully, respiratory failure due to COVID-19 complicated the patient's course. This highlights challenges in handling concurrent infections and comorbidities. Advanced age, DM, and cardiovascular disease likely worsened respiratory illness severity, increasing vulnerability to complications.

CONCLUSION

Finally, the lack of relevant epidemiological context and the rarity of *Desulfovibrio* infections in Portugal underscore the significance of this case.

Appropriate management of *Desulfovibrio*-induced liver abscesses entails percutaneous drainage and antibiotics. In this case, drainage and a 6-week course of metronidazole followed by amoxicillin/clavulanic acid led to clinical improvement.

Further research and similar case reports are needed to enhance our understanding of clinical traits and optimal management of Desulfovibrio-related liver abscesses across different regions.

CONFLICT OF INTEREST
The authors declare that they have no conflict of interests.

SOURCE OF FUNDING
This research had no funding sources.

ETHICAL ASPECTS
All participants submitted a consent form to be included in this study.

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