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Case Report

Multiple hepatosplenic abscesses in an immunocompetent host

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ABSTRACT

Sphingomonas paucimobilis, a gram-negative organism, mainly infects immunocompromised hosts due to its low virulence. Patients with such an infection usually have contact with healthcare. Meningitis, peritonitis, visceral abscess, septic arthritis, septicemia, post-traumatic endophthalmitis, and keratitis are among the documented complications of *Sphingomonas paucimobilis* infection. Such an infection is rarely seen in the literature as the one causing splenic and liver abscess and that too in an immunocompetent host. We present a case of a 23-year-old immunocompetent male, who presented with fever and other constitutional symptoms with recent onset of abdominal pain and fullness. Splenic and liver abscesses were detected on radiology with the growth of only *Sphingomonas* on blood culture and negative reports for other organisms excluding the differentials, proving S.mobilis being the cause of the abscesses. The patient was managed on broad-spectrum antibiotics and additional medications for symptomatic relief. The patient gradually improved over 7 days of hospitalization. This case report mainly focuses on *Sphingomonas paucimobilis* infection, which is rarely seen and documented, and surprisingly in an immunocompetent host causing life-threatening infections and abscesses. Even though it's a rare and a low virulence organism, such a presentation must not be overlooked. A regular and focused laboratory workup for detection and management, with adequate antibiotic treatment, is a must to avoid a poor prognosis.

Keywords: *Sphingomonas paucimobilis*, Immunocompetent host, Splenic abscess, Liver abscess

INTRODUCTION

Gram-negative, non-fermenting bacteria are commonly responsible for hospital-acquired and opportunistic infections worldwide.[1] *Sphingomonas paucimobilis* is one such organism that has been relatively less documented in the literature. Being less virulent, this organism mainly affects individuals with an immunocompromised profile; which includes chronic conditions like diabetes mellitus, chronic kidney disease, chronic respiratory ailments, steroid-using patients with autoimmune diseases, or malignancies.[1-4] Such patients usually have a history of contact with health care.[1-4] Though infrequent, *Sphingomonas paucimobilis* may cause severe infection leading to septicemia, meningitis, septic arthritis, osteomyelitis, visceral abscess, enteritis, and keratitis.[2-5] Such cases are seen among both, pediatrics and adults.[13] We here present a case of splenic and liver abscesses in a young male and more surprisingly in an immunocompetent patient with no contact with health care in the past.

CASE REPORT

We present a case of a 23-year-old male, with no known comorbidities or an immunocompromised state. He presented to the outpatient department (OPD) of our tertiary hospital with chief complaints of low-grade intermittent fever with a spike only in the evening or night, for 2 months. The fever was relieved by antipyretics. He also complained of generalized weakness, easy

fatiguability, body ache, and anorexia for 1 month. It was associated with a weight loss of 5 kg in the past 2 months. For the last month, the patient started experiencing abdominal fullness, and diffuse dull aching abdominal pain with early satiety. There were no complaints of diarrhea, vomiting, seizures, cough, hemoptysis, or breathlessness. No history of hospitalizations, previous surgery, comorbidities, chronic illness, or any drugs taken daily, were noted. No addictions or drug allergies were informed. He had a history of contact with pets and farm work.

Vitally, the patient was stable except for raised body temperature at the time of presentation at our hospital. On abdominal examination of the patient, there was right upper quadrant tenderness with hepatomegaly and mild splenomegaly was felt on palpation. For further investigations and management, the patient was advised to get himself admitted to the ward. He was jointly seen by the department of internal medicine and surgery. The fever eventually became continuous in nature with a baseline of 101F, without any medications. Based upon history and clinical examination, differential diagnosis mainly included TB, liver malignancy, brucellosis (in view of contact history with pets), or any pyogenic abscess. Laboratory reports as per Table 1.

Ultrasonography (USG) showed an enlarged liver with few hyperechoic surrounded by hypoechoic rim target sign appearance in both the lobes of the liver, suggestive of liver metastasis or an abscess cavity. The spleen was enlarged with variable hypoechoic areas with an enhancing cystic lesion. Following this contrast enhanced computed tomography (CECT) abdomen showed an enlarged right lobe of the liver (Figures 1 and 2), and multiple small round hypodense lesions (the largest one measuring 24×15 mm).

As per Figure 3, the spleen was also enlarged on CT with a large fairly defined, irregularly marginated hypoenhancing area, reaching up to the capsular surface, measuring around 83 cc in volume. Multiple small enhancing lymph nodes were seen, suggestive of an infective pathology. Based on this, a pyogenic abscess of the spleen and liver was diagnosed and broad-spectrum antibiotics were started, which included piperacillin-tazobactum, metronidazole, and amikacin, for 7 days. CT-guided aspiration biopsy was advised for organism identification, but it failed. Cartridge based nucleic acid amplification test (CB-NAAT), and immunoglobulin G (IgG) antibodies for brucellosis and *E. histolytica* were negative. A splenectomy was advised by the surgery department to which the patient declined.

Meanwhile, the blood culture sensitivity report arrived showing a growth of *Sphingomonas paucimobilis*. After 7 days of medical treatment, the patient was much better symptomatically with no fever spikes, abdominal pain, or weakness. He then took discharge against medical advice.

Table 1: Laboratory reports.

Lab parameter	Value	Normal range
PS For CM		
Neutrophils (%)	59	40-60
Lymphocytes (%)	31	20-40
Eosinophils (%)	01	2-6
Monocytes (%)	09	2-8
Basophils (%)	0	0-1
Total leukocyte count ($\times10^9$/l)	3.2	4-10
Red blood cell count (million/cmm)	5.09	4.5-5.5
Hemoglobin (g/dl)	10.5	13-17
Hematocrit (%)	34.0	36-46
Platelet count ($\times10^9$/l)	198	150-410
PT | INR	12.20 | 1.04	
ESR	11	Upto 10 mm/1st hour
CRP (mg/l)	11.1	<3
S. creatinine (mg/dl)	0.66	0.8- 1.30
Na^+/K^+/ionized Ca^+ (mmol/l)	130/3.1/ 1.10	136-145/3.8-5.3/1.15-1.33
LFT		
S. ALP (U/l)	646	46-116
S. total bilirubin/direct/indirect (mg/dl)	2.48/1.65 /0.83	0.2-1.0/0-0.2/0-0.8
S. total protein (gm/dl)	5.32	6.4-8.2
Albumin (gm/dl)	2.7	3.4-5.0
A/G ratio	1.03	1-2
SGOT | SGPT	646 | 2.48	46-116 | 0.2-1.0
S. urea (mg/dl)	24	15-40
S. LDH (U/l)	403	85-227
S. ferritin (micrograms/l)	>1650	22-322

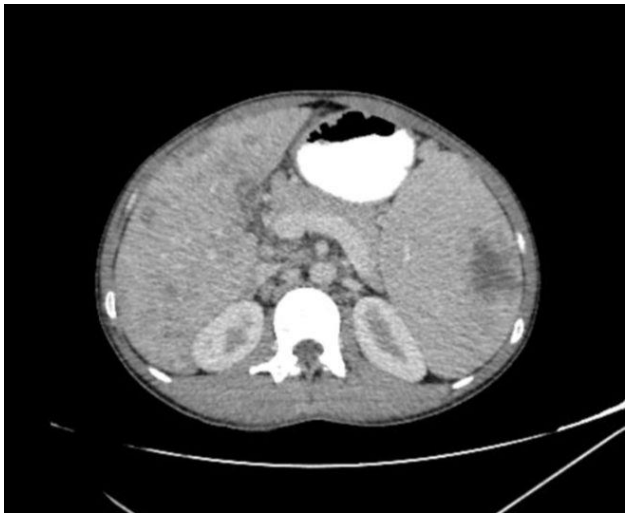

Figure 1: Computed tomography of abdomen showing multiple abscesses in liver

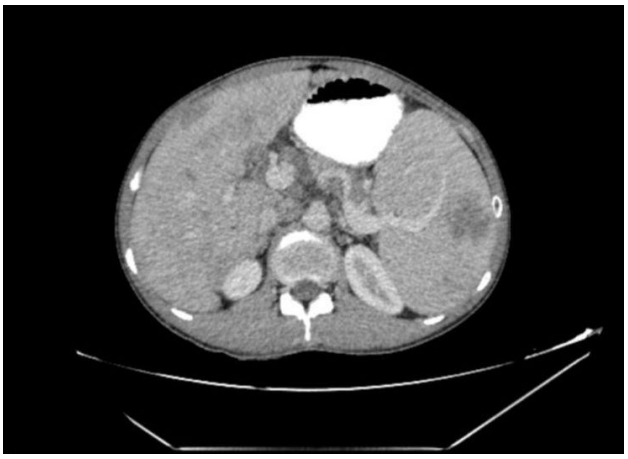

Figure 2: Computed tomography of abdomen showing multiple abscesses in liver.

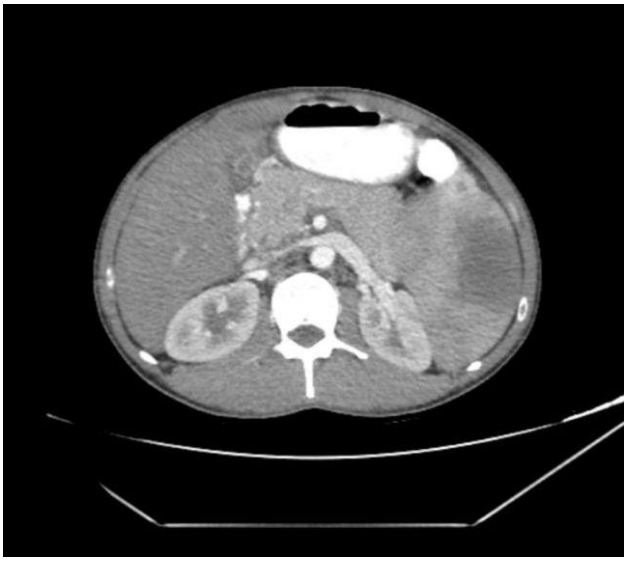

Figure 3: Computed tomography of abdomen showing a single abscess cavity in the spleen

DISCUSSION

Sphingomonas paucimobilis is an aerobic, catalase, and oxidase-positive, gram-negative bacilli. It is flagellated, unsporulated, and yellow-pigmented.[2] It is considered less virulent because of the presence of glycosphingolipid in its membrane instead of lipopolysaccharide A which is usually found in gram-negative organisms. The monokine production induced by lipopolysaccharide A is much stronger than that of glycosphingolipid, thus a less severe inflammatory response with *S. paucimobilis*.[11] *S. paucimobilis* is omnipresent in the environment and can infect patients in hospitals via contaminated distilled water, sterile drug solutions, hemodialysis fluids, catheters used in dialysis, and ventilator devices.[2,9] This infection is usually seen in immunocompromised states like malignancies, steroid use, immunodeficiencies, or chronic disease states like diabetes mellitus, chronic kidney disease, or chronic respiratory conditions.[1-4]

According to a retrospective study done by Rohilla in a teaching school in Uttarakhand, diabetes mellitus and steroid use were the most common comorbid conditions in which *S. paucimobilis* infection was seen.[3]

Such patients commonly have a contact history with healthcare facilities. A retrospective study by Ionescu et al showed that at least 43% of patients with bloodstream infections had a hospital-acquired infection and 37% had acquired one from the community.[12]

Thus, this case of a 23-year male is quite peculiar because he is not only an immunocompetent person but also had no health care contact before this visit to our hospital.

Septicemia, meningitis, lower respiratory tract infections, and ventilator-associated pneumonia are the most significant and common complications of infections caused by this organism, as shown by Rohilla in the retrospective study.[3] Various case reports showing different infection sites of this organism are documented in literature like a splenic abscess, meningitis, osteomyelitis, secondary septic arthritis, bacteremia with septic pulmonary emboli, intra-abdominal abscess in a patient undergoing peritoneal dialysis, bacteremia outbreak in dialysis room among those using a common dialysis catheter, and paucimobilis fulminant keratitis.[2,5-10]

This case report is the second case of splenic abscess by *S. paucimobilis* documented in the literature, and probably the first case report of such an abscess in an immunocompetent host. The strain identified in the blood culture is susceptible to piperacillin/tazobactam, ceftriaxone, cefepime, imipenem, meropenem, amikacin, ciprofloxacin, and tigecycline. The purpose of this case report is to spread awareness about this less-known cause of hepatosplenic abscess. Though rarely, *S. paucimobilis* can cause serious complications in an immunocompetent host.

CONCLUSION

Sphingomonas paucimobilis, a low virulent, gram-negative bacillus; usually causes nosocomial or a community-acquired infection in immunocompromised patients but our case report emphasizes the fact of not neglecting such an infection even in an immunocompetent host.

Various systemic complications are known to occur in *S. paucimobilis* infection, which clinically evokes various common differential diagnoses, overlooking this organism. A swift diagnosis with appropriate clinical, laboratory, and radiological investigations; is necessary to prevent life-threatening complications.

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