

# Sphingomonas Paucimobilis: An Unusual Cause of Meningitis—Case Report

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## Abstract

*Sphingomonas paucimobilis* is an aerobic gram-negative bacillus. The bacteria can cause infections, which can be devastating and, therefore, the patients need adequate and early antibiotic cover. We are presenting an interesting case of meningitis secondary to an unusual *S. paucimobilis* infection. This is the second case to our knowledge in the literature on meningitis due to *S. paucimobilis*. The 31-year-old previously healthy man presented with 2 months' history of weight loss and loss of appetite. He had fever and headache for 3 weeks. He was also speaking irrelevantly for 3 weeks. He had change of behaviour for 1 day. The patient was a farmer and worked in the soil. On examination, he was not responding to questions and was not obeying commands. Computed tomography (CT) brain with contrast revealed meningeal enhancement and cerebral oedema. Lumbar puncture was performed. Cerebrospinal fluid (CSF) opening pressure was more than 50 cm H<sub>2</sub>O. CSF analysis showed meningitis picture with raised white cell count of 210/μL (predominantly neutrophils), glucose 3.1 mmol/L, and raised protein 2.47 g/L. He was given intravenous ceftriaxone. The following day, his condition deteriorated. CSF culture grew *S. paucimobilis* sensitive to ceftriaxone. *S. paucimobilis* causes severe meningitis. This can lead to hydrocephalus, which results in a need for extraventricular drainage. A good occupational history is important with regard to finding the aetiology of serious meningitis (including rare bacteria) even before the culture result is known. Appropriate treatment can be given early and adequately to prevent mortality.

Key words: meningitis, organism, bacteria, infection, *Sphingomonas paucimobilis*

## Introduction

*Sphingomonas paucimobilis* is a non-fermentative aerobic Gram-negative bacillus.<sup>1,2)</sup> *S. paucimobilis* is yellow-pigmented, motile with polar flagellum and non-spore-forming.<sup>3)</sup> The organism is found in normal environment in soil, as well as medical devices, contaminated fluid, and respirators in the hospital.<sup>2-4)</sup> We are presenting an interesting case of meningitis secondary to *S. paucimobilis* infection.

## Case Report

The 31-year-old previously healthy man with no previous medical illness presented to emergency department at a tertiary hospital in Malaysia in May 2012 with complaints of fever and headache for 3 weeks. He had history of loss of appetite and weight loss for 2 months. His condition progressively became worse during the last three weeks as

he became more lethargic and was speaking irrelevantly. One day prior to admission, the patient had change in his behaviour. He went to see the general practitioners twice over the course of 3 weeks, but the administration of antibiotics was unknown.

The patient was initially sent to a private hospital on 25 May 2012. Glasgow Coma Scale (GCS) was 10/15 (E4V1M5). The power was 3+/5 in both upper and lower limbs. Plantar response was upgoing on the right side. Computed tomography (CT) of the brain (contrasted) done at the private hospital showed widespread meningeal enhancement in the brain with cerebral oedema and hydrocephalus (Fig. 1a–f). The patient was diagnosed with meningoencephalitis and transferred to the University Malaya Medical Centre.

On examination, his GCS was E4V2M5 (11/15). He was not responding to questions and was not obeying commands. Neck stiffness was present. Pupils were 4 mm in size bilaterally and were reacting sluggishly. Blood pressure (BP) was 146/88 mm Hg. He was afebrile. The tone was normal in upper and lower limbs bilaterally.

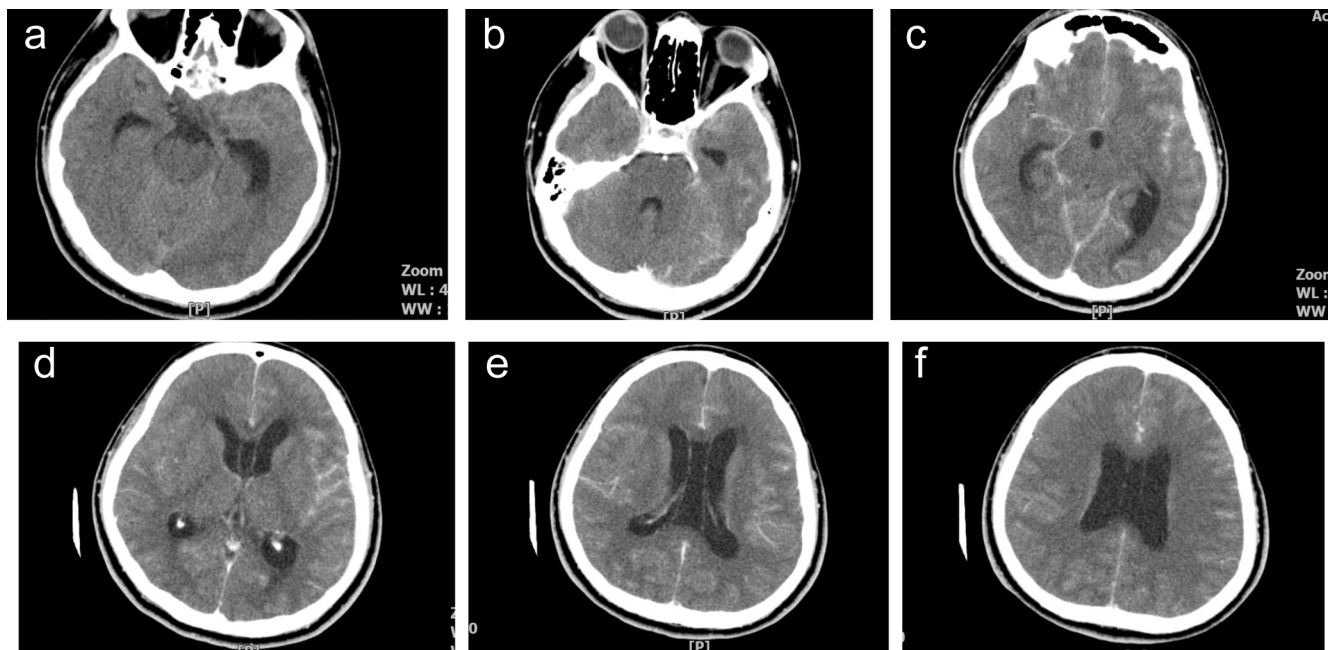


Fig. 1 a–f: Initial computed tomography scan showing hydrocephalus and cerebral oedema.

The power was at least 3/5 at upper and lower limbs bilaterally. Reflexes were normal in all the limbs. Plantar response was downgoing bilaterally. Lung examination was normal.

Lumbar puncture was done. Cerebrospinal fluid (CSF) opening pressure was more than 50 cm H<sub>2</sub>O. CSF result showed presence of raised white blood cells (WBCs) 210/μL (neutrophils 78%, lymphocytes 12%), glucose 3.1 mmol/L, and raised protein 2.47 g/L, which was consistent with meningitis. He was given intravenous ceftriaxone and acyclovir. He was given anti-tuberculous medication to cover tuberculous meningitis. Chest X-ray was normal.

Repeat plain CT brain done after lumbar puncture showed unchanged degree of hydrocephalus and cerebral oedema. Full blood count showed Hb 191 g/L, WBC  $9.0 \times 10^9$ /L (neutrophils 89%, lymphocytes 5%), and platelet count of  $251 \times 10^9$ /L. Renal function and electrolytes were normal. Immunoglobulin titres were not checked.

The following day in the morning, he was opening his eyes to call and was able to lift his right upper limb on command. GCS was 9/15 (E3V1M5). At night on the same day, the patient's GCS dropped to 7/15. His pupils were unequal. Right pupil was 4 mm and left pupil was 6 mm.

He was intubated and ventilated. Repeat plain CT brain showed increased degree of cerebral oedema and unchanged degree of hydrocephalus (Fig. 2a–e). He was planned for extraventricular drainage (EVD) by neurosurgical team on the following day. But, the patient passed away in the morning the following day.

CSF culture grew *S. paucimobilis* sensitive to ceftriaxone,

ceftazidime, ciprofloxacin, and piperacillin/tazobactam (Tazosin). CSF acid-fast bacillus (AFB) smear was negative. CSF AFB C&S was negative. CSF tuberculous (TB) polymerase chain reaction (PCR) was negative. Blood culture showed no growth. A diagnosis of meningitis secondary to *S. paucimobilis* was made. Permission for autopsy was not obtained. Unfortunately a microphotographic picture has not been kept in stock.

## Discussion

We are reporting on a second case to our knowledge in the literature on meningitis due to *S. paucimobilis*. The first case of *S. paucimobilis* was a 39-year-old man with an epilepsy for 3 years who complained of headache for 2 days and seizures on the day of admission.<sup>5)</sup> CSF culture and blood culture grew *S. paucimobilis*, which was sensitive to rifampicin.<sup>5)</sup> The most likely cause of infection was through the gastrointestinal tract.<sup>5)</sup>

The most possible source of infection for our patient was from the soil. The patient was a farmer, so he had to work on soil. He developed a wound on his leg, which later led to the risk of infection. The bacteria entered his body through the wound resulting in bacteraemia and later meningitis.

When the patient went to the hospital, the meningitis was serious. He went to see the general practitioners but was not given appropriate treatment. Therefore, bacteraemia became progressive and meningitis became worse.

*S. paucimobilis* has low clinical virulence.<sup>2)</sup> The bacteria do not have the lipopolysaccharide components

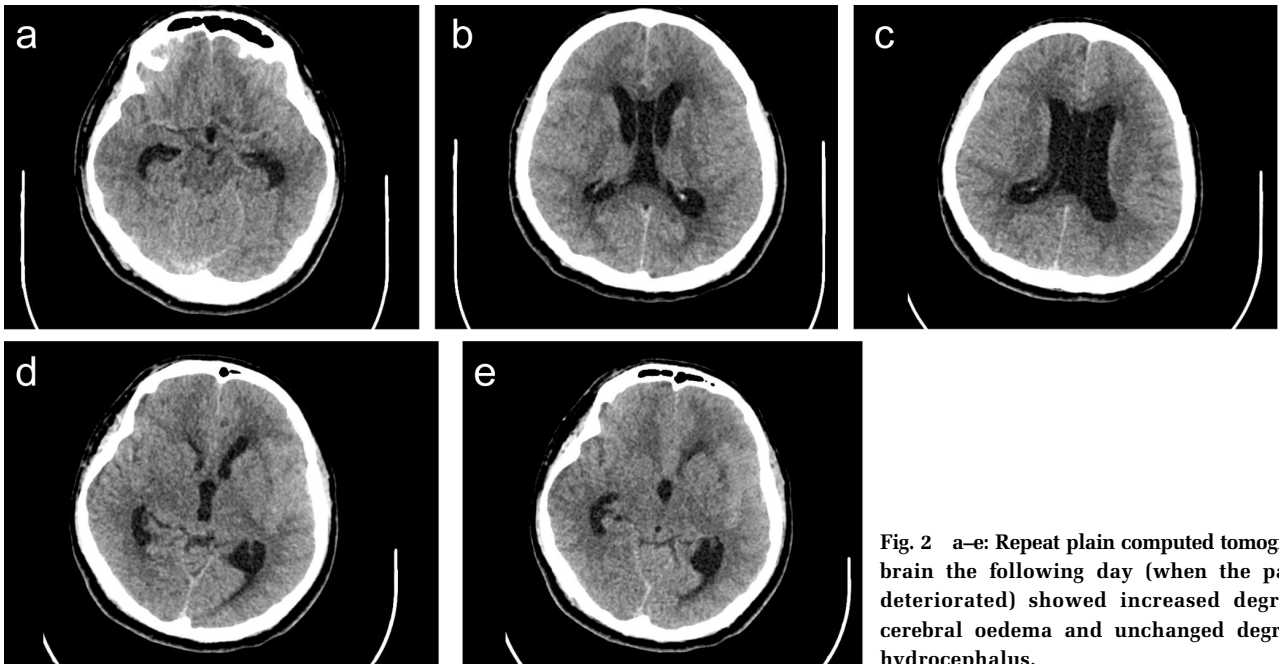


Fig. 2 a–e: Repeat plain computed tomography brain the following day (when the patient deteriorated) showed increased degree of cerebral oedema and unchanged degree of hydrocephalus.

(exotoxin) in the outer membrane of the cell wall found in gram-negative organisms.<sup>2)</sup>

*S. paucimobilis* causes infections in healthy people and immunocompromised patients.<sup>1,4)</sup> It can also cause bacteraemia and septicaemia leading to septic shock.<sup>2)</sup> The organism responds well to fluoroquinolones, beta-lactam/beta lactamase inhibitor combination, and carbapenems,<sup>1,4)</sup> but are resistant to penicillins and first-generation cephalosporins.<sup>1)</sup>

In a study on *S. paucimobilis* infection in patients, about 50% had community-acquired infections and 50% had nosocomial infections.<sup>6,7)</sup> Primary bacteraemia was found in 50% of patients with community-acquired infections.<sup>8)</sup> The overall mortality rate was 6%.<sup>7)</sup>

In a haematology case series, it was found that infections due to *S. paucimobilis* arose from contaminated hands of hospital staff and contaminated hospital fluid.<sup>3)</sup> One patient with acute myeloid leukaemia had *S. paucimobilis* bacteraemia from catheter-related infection.<sup>1)</sup>

There were case reports on septic arthritis with osteomyelitis<sup>9)</sup> and associated pulmonary emboli.<sup>6)</sup> Two cases of resistant medical therapy were peritoneal dialysis-associated peritonitis with peritoneal dialysis catheter removal<sup>10)</sup> and recurrent acute endophthalmitis, with vitrectomy.<sup>9)</sup>

In conclusion, we are presenting a case of meningitis secondary to an unusual organism, *S. paucimobilis*. The *S. paucimobilis* infection is a serious community-acquired infection, which results in mortality. A good occupational history is important to find the aetiology of serious meningitis. This is the second case in litera-

ture on meningitis due to *S. paucimobilis*. The human immunodeficiency virus (HIV) status of the patient was unknown.

### Conflicts of Interest Disclosure

The author does not have any financial and personal relationships with other people or organizations that could inappropriately influence the work. The author does not have actual or potential conflicts of interest with regard to the manuscript submitted for review. There are no conflicts of interest. The first author and corresponding author has submitted Self-reported Potential Conflict of Interest (COI) Disclosure Statement online. The first author and corresponding author is not a member of The Japan Neurosurgical Society (JNS).

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