

# Atypical Presentation of Bacterial Meningitis in an Elderly Patient– A Case Report

Muhammad Bilal

Assistant Professor, Medicine MTI  
Lady Reading Hospital, Peshawar.

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Correspondence

\*E: dr\_bilal79@hotmail.com

## ABSTRACT

Bacterial meningitis is a serious infection that typically presents with a classic triad of fever, headache, and neck stiffness. However, atypical presentations can obscure the diagnosis, leading to delayed treatment and adverse outcomes. We present a case of a 65-year-old male who initially presented with lower back pain, right lower limb pain and weakness, swelling, and fever, without the characteristic signs of meningitis. This atypical presentation led to initial misdiagnoses of multiple myeloma and urinary tract infection. The patient subsequently developed seizures. A definitive diagnosis of bacterial meningitis was made through cerebrospinal fluid analysis and MRI of the brain. This case underscores the importance of considering atypical presentations of bacterial meningitis, particularly in elderly patients, to ensure timely diagnosis and appropriate management.

Keywords: Bacterial Meningitis, Elderly, Pakistan

## Introduction

Bacterial meningitis is a serious infection of the meninges, the protective membranes surrounding the brain and spinal cord. While it typically presents with a classic triad of fever, headache, and neck stiffness, atypical presentations can obscure the diagnosis, leading to delayed treatment and adverse outcomes. In particular, elderly patients may present with subtle or non-specific symptoms, such as back pain, focal neurological deficits, or gastrointestinal disturbances. Early recognition and prompt initiation of appropriate antibiotic therapy are crucial to improving patient outcomes and reducing mortality.

## Case Presentation

A 65-year-old male with diabetes, hypertension, and a history of herpes simplex infection presented with lower back pain, right leg swelling, and fever (103°F to 105°F). Initial diagnosis was urinary tract infection, but persistent symptoms and worsening condition led to further investigations. Despite normal spine MRI and negative Doppler ultrasound, his platelet count decreased, and ESR increased. Neurologic deterioration with seizures and altered mental status prompted urgent evaluation. Brain CT was normal, but lumbar puncture confirmed bacterial meningitis with left focal cerebritis. This case highlights the importance of considering atypical presentations of serious infections, especially in elderly patients with comorbidities. The patient's clinical presentation and laboratory findings raised concerns for serious infections, including bacterial meningitis, sepsis, and disseminated intravascular coagulation (DIC), as well as neurological disorders such as stroke and encephalitis. Further investigations, including lumbar

puncture and blood cultures, were considered to confirm the diagnosis and guide appropriate treatment.

**Further Diagnostic Assessment:** A lumbar puncture revealed cloudy cerebrospinal fluid (CSF) with elevated white cell count (640–650 cells/cmm, predominantly neutrophils), low glucose (9 mg/dl), and high protein (1230 mg/dl). Gram staining showed Gram-positive diplococci, confirming bacterial meningitis.

**Cerebrospinal Fluid Analysis:** Blood Glucose taken at the time of lumbar puncture was 198 mg/dl.

| Cerebrospinal Fluid Analysis: Tests | Cerebrospinal Fluid Analysis: Hospital Lab Patient Values | Cerebrospinal Fluid Analysis: Private Lab Patient Values |
|-------------------------------------|-----------------------------------------------------------|----------------------------------------------------------|
| Turbidity                           | Cloudy                                                    | Cloudy                                                   |
| Clots                               | Nil                                                       | Nil                                                      |
| Colour                              | Pale Yellow                                               | Pale yellow                                              |
| Protein                             | 1231 mg/dl                                                | 1230 mg/dL                                               |
| CSF Glucose/Blood Glucose           | 17 mg/dL                                                  | 09 mg/dL                                                 |
| WBC                                 | 640 /cmm                                                  | 650 / cmm                                                |
| Neutrophils                         | 75 %                                                      | 78 %                                                     |
| Lymphocytes                         | 25 %                                                      | 22 %                                                     |
| RBC                                 | 04 – 06 / HPF                                             | Nil                                                      |
| Gram Stain                          | No organism seen                                          | + ve diplococci                                          |
| ZN Stain                            | No AFB Seen                                               | No AFB Seen                                              |
| Gene Xpert                          | Negative                                                  | -                                                        |
| LDH                                 | -                                                         | 189 U/L                                                  |

Imaging Studies:

| Study name                                         | Report                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ultrasound Abdomen and pelvis:                     | Prostate: 54 Grams, Normal Study otherwise                                                                                                                                                                                                                                                     |
| Ultrasound Doppler Arterial and venous Lower limbs | Normal Study with No DVT and normal flow.                                                                                                                                                                                                                                                      |
| MRI Lumbosacral (Private Setup)                    | Normal Study                                                                                                                                                                                                                                                                                   |
| MRI Lumbosacral Spine (Hospital)                   | Lumbar Spondylosis L2-3 and L3-4 levels with a hemangioma at D12 – L1 vertebrae                                                                                                                                                                                                                |
| MRI Brain with contrast                            | Cortical-based T2W and FLAIR signals intensity focus measuring 10.6x10.5 mm (AP x TR) in the high left frontal lobe, revealing post-contrast enhancement.<br>Post Contrast T1W images reveal exaggerated Meningeal Enhancement<br><u>Result:</u> Meningitis with Focal left Frontal Cerebritis |

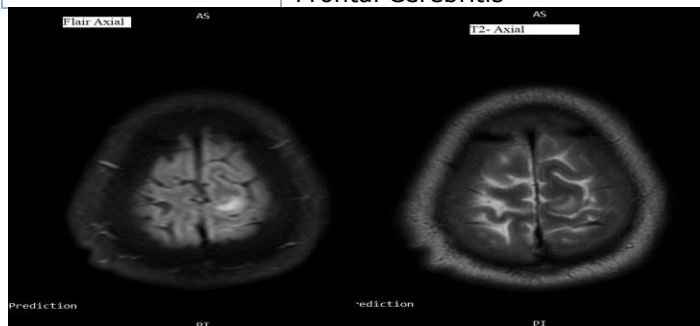


Figure 1- a) FLAIR – Axial b) T2 – Axial, - Cortical Based FLAIR and T2W signals intensity focus measuring 10.6x10.5mm (AP x TR) in the high left frontal lobe - Left focal frontal Cerebritis

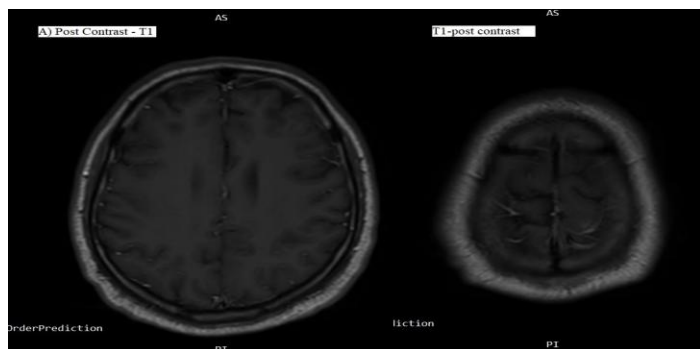


Figure 2 Post Contrast T1-w image showing meningeal enhancement and lesion enhancement - signifying meningitis.

Initially, urinary tract infection (UTI) was suspected due to pyuria and treated with oral antibiotics. However, persistent symptoms and negative urine culture led to its exclusion. Deep vein thrombosis (DVT) was considered due to unilateral limb swelling, but Doppler ultrasound ruled it out. Cellulitis was less likely due to the absence of local signs of inflammation. Spinal pathology was excluded by a normal lumbar spine MRI.

Given the patient's neurological deterioration, conditions like hemorrhagic stroke and space-occupying lesions were considered. However, a normal brain CT scan made these less likely. Ultimately, the diagnosis of bacterial meningitis with left focal cerebritis was confirmed by cerebrospinal fluid analysis, which revealed elevated white cell count, low glucose, high protein, and the presence of Gram-positive diplococci.

The patient's condition improved over the following weeks. After two days of treatment, his GCS improved to 13/15, although right lower limb weakness persisted. A new complication emerged: sensorineural hearing loss in the right ear, confirmed by audiogram. An ENT consultation recommended follow-up after completion of meningitis treatment. At discharge, the patient's limb strength had improved, but the hearing loss remained. A two-week follow-up revealed further deterioration in hearing, and the patient was advised to use a frequency-specific hearing aid.

## Discussion

Bacterial meningitis is a life-threatening condition that typically presents with fever, headache, neck stiffness, and altered mental status<sup>1,2,3</sup>. The most frequently observed symptoms are headache (84%), fever (74%), neck stiffness (74%), and altered mental status<sup>1,2</sup>. It is noteworthy that the classic triad of symptoms fever, neck stiffness, and altered mental status manifests in merely 44% of bacterial meningitis instances<sup>1,2</sup>. Nonetheless, 95% of patients present with at least two of the following four signs: headache, fever, neck stiffness, or changes in mental status<sup>1, 2</sup>. However, not all patients present with these symptoms, and atypical presentations such as gastrointestinal sign symptoms, back pain, or focal neurological signs can lead to delayed diagnosis and treatment<sup>2, 3, 4</sup>. Focal neurological deficits are most commonly linked to cerebrovascular events like ischemia but can sometimes arise from conditions such as subdural empyema's, cerebral abscesses, CNS hemorrhages, or intense meningeal inflammation<sup>5</sup>. In these cases, toxic inflammatory molecules may cross the pial barrier, leading to neuronal necrosis and focal cerebritis<sup>5</sup>. However, numerous reports in the literature document atypical presentations that can complicate timely diagnosis and management. In a large retrospective study by van de Beek et al., it was found that only 44% of patients presented with the classic triad of symptoms, while nearly 95% had at least two of the following: headache, fever, neck stiffness, or altered mental status<sup>2</sup>. This underscores the variability of clinical presentations and the need for heightened clinical suspicion, especially in cases where classical symptoms are absent. A delay in

diagnosis and hence treatment due to the atypical presentation can lead to the sequel of meningitis, like Cerebritis as in our case, which can further lead to abscess formation if left untreated<sup>8</sup>. In adults, pneumococcal meningitis poses the greatest risk for focal neurological deficits, which are typically caused by cerebral infarctions<sup>9</sup>. However, these deficits may also arise from conditions such as cerebritis, subdural empyema, brain abscesses, or intracerebral hemorrhages<sup>9</sup>. Though the literature is missing the exact presentation of meningitis as lower back pain and unilateral limb swelling in the absence of other causes, meningism secondary to Sub arachnoid Hemorrhage has presented with Sudden onset lower back pain in certain cases<sup>10</sup>, and ischemic stroke patients often have limb edema due to muscle dysfunction which can lead to fluid accumulation in the affected limb<sup>11</sup>. Unilateral limb edema was identified in more than 37% of post-stroke patients, whereas only 3% of the control group exhibited this condition, the occurrence of this phenomenon is important in a clinical context, as it may worsen the function of the limb that is already compromised<sup>12</sup>.

**Clinical Implications:** Given the diagnostic complexity of atypical bacterial meningitis, performing an early lumbar puncture, followed by CSF analysis, continues to be the definitive diagnostic approach, especially in patients with

unexplained systemic symptoms<sup>4</sup>. As noted by Tunkel et al., early recognition of meningitis and prompt initiation of antimicrobial therapy is crucial for improving patient outcomes<sup>13</sup>. In our case, the initial diagnostic delay due to atypical symptoms and the absence of neck stiffness or mental status change could have led to severe complications, including permanent neurological deficits<sup>13</sup>. Early lumbar puncture, despite a non-classical presentation, could have expedited the diagnosis and treatment, potentially reducing morbidity<sup>3-5</sup>.

## Conclusion

This case highlights the importance of considering atypical presentations of bacterial meningitis, especially in elderly patients with comorbidities. This case underscores the need for a high index of suspicion for bacterial meningitis, even in the absence of classic symptoms such as neck stiffness or altered mental status. Early recognition and prompt initiation of appropriate antibiotic therapy are crucial to improving patient outcomes and reducing mortality.

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