

Challenges in Tuberculous Meningitis

Diagnosis: A Case Report of Progressive Headache in an Adult

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Background

One of the most severe forms of tuberculosis, tuberculous meningitis (TBM), still has significant morbidity and mortality rates. To improve recovery for those affected by this infection, the World Health Organization (WHO) emphasizes the importance of early diagnosis and adequate treatment. According to recent studies, TBM can result from direct infection of the central nervous system as well as hematogenous spread of pulmonary tuberculosis.

Case Presentation

A 34-year-old woman came to the hospital with a chief complaint of a severe headache that had been felt for three days. The headache was felt all over, throbbing, and progressive. The complaint was accompanied by nausea, fever for the last two days, and feeling unwell, without vomiting or seizures.

Routine blood tests upon admission showed a white blood cell count of $9.84 \times 10^3/\mu\text{L}$. Empiric therapy with ceftriaxone antibiotic started on day 5 of hospitalization, based on the possibility of bacterial infection. Stool culture results obtained on day 8 showed no bacterial growth. The patient also received antipyretics (tramadol), neurotrophic supplements, and sedatives. However, the headache did not show significant improvement. Human Immunodeficiency Virus (HIV) antibody testing yielded non-reactive results, the thorax image showed an impression of interstitial pneumonia, and a CT scan of the head without contrast showed no infarction, hemorrhage, or signs of intracranial enhancement.

By day 11, the patient was given fluconazole, which was later changed to voriconazole due to suspicion of fungal infection. The antibiotics were changed from ceftriaxone to clindamycin. Blood culture showed no bacterial growth.

By day 21, the patient lost consciousness. Physical examination revealed a negative pathological reflex and no sign of meningeal stimulation. Complete blood count showed leukocytosis with a leukocyte count of $29.24 \times 10^3/\mu\text{L}$. The patient was then transferred to the intensive care unit (ICU). Lumbar puncture was performed and the cerebrospinal fluid (CSF) specimen was immediately sent to the microbiology laboratory as much as 10 ml, before the CSF test was first centrifuged and obtained a change in CSF color from clear to yellowish, a phenomenon known as xanthochromia (figure.1). Following this, clinical microbiological test using Ziehl-Neelsen staining (ZN) on the cerebrospinal fluid specimen revealed the presence of acid-fast bacilli (AFB) (Figure 2). However, cerebrospinal fluid culture did not show bacterial growth, and India ink staining did not reveal any encapsulated yeast.

Unfortunately, the patient passed away that same evening, before receiving anti-tuberculosis therapy and having an MRI scan scheduled for 2 days later.

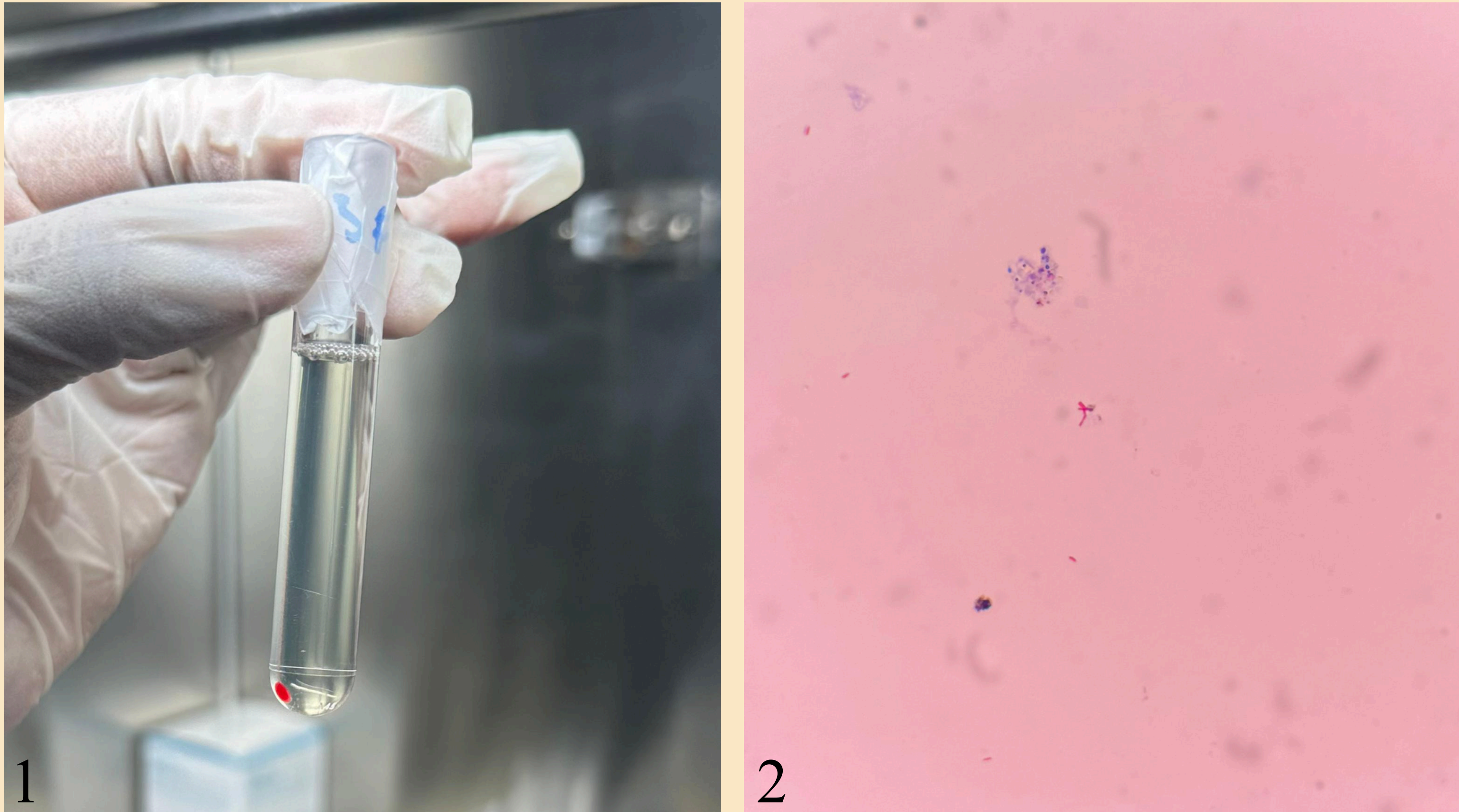


Figure 1. Discoloration of CSF to yellowish due to the presence of bilirubin called xanthochromia.

Figure 2. There were acid-fast bacilli in the CSF specimen.

Discussion

Diagnosing tuberculous meningitis is complex because the clinical symptoms are non-specific and the number of bacilli in cerebrospinal fluid is very low. Ziehl-Neelsen staining is very easy, cheap, and can be used quickly in diagnosing but has a very low sensitivity (about 10% to 15%), so it is necessary to do further tests such as Xpert MTB/RIF test which has a high sensitivity and specificity of 70% and 97%, but WHO still recommends mycobacterial culture as a gold standard. Xanthochromia in the cerebrospinal fluid of patients with TBM is a significant diagnostic indicator that can help distinguish TBM from other meningitis and conditions such as subarachnoid hemorrhage (SAH).

Conclusion

Tuberculous meningitis may present with non-specific symptoms initially, so it is essential to consider this possibility in the differential diagnosis of progressive headache with fever, especially in tuberculosis-endemic areas. Late diagnosis and treatment can lead to fatality, as demonstrated in this case. Early detection through lumbar puncture and Ziehl-Neelsen staining is essential for successful treatment. Therefore, the role of clinical microbiology laboratories becomes crucial in confirming a diagnosis of tuberculosis.

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Conflicts of Interest

All authors declare that they have no conflicts of interest