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**CASE REPORT**  
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**IMPORTANCE OF EARLY DIAGNOSIS OF TUBERCULOUS MENINGITIS  
USING GENEXPERT MTB/RIF**

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**ABSTRACT**

Tuberculous meningitis (TBM) is the most devastating consequence of infection with Mycobacterium tuberculosis (TB). Approximately a third of patients die soon after presenting to hospital, and many of those surviving are left with severe neurological sequelae. Due to high suspicion for Tuberculous Meningitis based on CT Brain findings and his social history (citizen from a country with high incidence of TB and father was treated previously for pulmonary TB), his CSF sample was also sent for GeneXpert MTB/RIF. CSF GeneXpert MTB/RIF showed MTB detection at low level with no rifampicin resistance. Patient was commenced on anti-TB medications (Isoniazid, Rifampicin, Streptomycin and Pyrazinamide). patient had an episode of reduced responsiveness with drop in Glasgow Coma Scale up to 9/15 during admission. Therefore, another CT Brain was repeated, which showed presence of non-resolving hydrocephalus after ELD removed. Therefore, a ventriculo-peritoneal (VP) shunt was inserted. His GCS improved up to 13/15 (did not completely resolve) after VP shunt was inserted. This patient suffered Stage 2 of TB Meningitis based on British Medical Research Council Classification. Despite early initiation of therapy and VP shunt insertion, patient still had several neurological deficits such as incomplete recovery of GCS, bilateral 6<sup>th</sup> nerve palsies and dysphagia upon discharge.

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## INTRODUCTION

Tuberculous meningitis (TBM) is the most devastating consequence of infection with *Mycobacterium tuberculosis* (TB). Approximately a third of patients die soon after presenting to hospital, and many of those surviving are left with severe neurological sequelae. However, many patients are diagnosed late because initial signs are aspecific, and rapid and sensitive diagnostic tests are lacking.

## CASE REPORT

A 27 year old Burmese gentleman presented to Accident and Emergency Department with fever, loss of appetite and headache with diplopia for about 1 month. He had several episodes of vomiting for 10 days and altered behavior (increased agitation) for 3 days. On examination, patient had neck stiffness with positive meningeal signs and 6<sup>th</sup> nerve palsy bilaterally. He was treated as meningoencephalitis and was commenced on IV Ceftriaxone and IV Acyclovir on arrival. CT Brain with contrast done showed diffuse leptomeningeal enhancement with communicating hydrocephalus. We proceeded with lumbar puncture, which showed a very high opening pressure (above 50 mmHg). Cerebrospinal fluid (CSF) showed elevated protein (1.310) and significantly reduced glucose level. However, CSF cell count was nil with no acid fast bacteria detected on Ziehl Neelsen smear. His CSF Gram stain and culture and sensitivity showed no growth of any bacteria with CSF Indian Ink and Cryptococcal Antigen PCR turning out to be negative. Due to high suspicion for Tuberculous Meningitis based on CT Brain findings and his social history (citizen from a country with high incidence of TB and father was treated previously for pulmonary TB), his CSF sample was also sent for GeneXpert MTB/RIF. CSF GeneXpert MTB/RIF showed MTB detection at low level with no rifampicin resistance. Patient was commenced on anti-TB medications (Isoniazid, Rifampicin, Streptomycin and Pyrazinamide). Patient was also referred to Neurosurgery Team for communicating hydrocephalus with high opening CSF Pressure. Initially, an external lumbar drainage (ELD) was done and then, removed after 1 week when CSF stopped draining. However, patient had an episode of reduced responsiveness with drop in Glasgow Coma Scale up to 9/15 during admission. Therefore, another CT Brain was repeated,

which showed presence of non-resolving hydrocephalus after ELD removed. Therefore, a ventriculo-peritoneal (VP) shunt was inserted. His GCS improved up to 13/15 (did not completely resolve) after VP shunt was inserted. He completed intensive phase of anti-TB therapy for 2 months and then was discharged. He will be under maintenance phase of anti-TB treatment for at least 9 to 10 months under monitoring of chest physician clinic. His CSF Culture done in Mycobacterial Growth Indicator Tube (Bactec), which took about two weeks to be processed showed no growth.

## DISCUSSION

This case illustrates that early diagnosis of TB Meningitis is pivotal for early initiation of treatment and surgical interventions, if needed to prevent severe neurological sequelae. This patient suffered Stage 2 of TB Meningitis based on British Medical Research Council Classification. Despite early initiation of therapy and VP shunt insertion, patient still had several neurological deficits such as incomplete recovery of GCS, bilateral 6<sup>th</sup> nerve palsies and dysphagia upon discharge.

## CONCLUSION

This case also reiterates the role of GeneXpert MTB/RIF as the most sensitive method in diagnosing TB Meningitis compared to other available diagnostic tests. Social history plays an important role in making early prompt decisions to send samples for the appropriate diagnostic tests.

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