

## POST-TUBERCULOUS MENINGITIS HYDROCEPHALOUS- A CASE REPORT

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### ABSTRACT

Mycobacterium tuberculosis bacteria infect host lungs while inhaling them from the external environment, causing a localized infection with a potential to spread to local lymph nodes. The bacilli have the property to disseminate to other organs including Central Nervous System (CNS) and lead to tuberculous meningitis (TBM). The bacilli may develop tiny sub-pial or sub-ependymal rich foci. These rich foci get larger as the illness worsens and may finally burst into the sub-arachnoid region, causing meningitis. Tuberculous meningitis is linked to a high mortality rate. The majority of TBM patients who survive have long term neurological disabilities. This case was presented to Aga Khan University Hospital Karachi, Pakistan and the patient has taken Leave Against Medical Advice twice due to financial crises.

**Key Words:** Hydrocephalus, Tuberculous meningitis, Mycobacterium

### INTRODUCTION

Mycobacterium Tuberculosis bacteria infect host lungs while inhaling them from the external environment, causing a localized infection that radially spreads to local lymph nodes. The bacilli have the property to disseminate to other organs including Central Nervous System(CNS) and lead to tuberculous meningitis (TBM). The bacilli may develop tiny sub-pial or sub-ependymal rich foci. These rich foci get larger as the illness worsens and may finally burst into the sub-arachnoid region, causing meningitis (1).

Tuberculous meningitis is linked to a high mortality rate. The majority of TBM patients who survive have debilitating neurological consequences. One of the frequent complications of TBM, which affects a considerable number of patients, is hydrocephalus. The development of hydrocephalus may occur paradoxically following the start of anti-tuberculosis therapy or it may be a presenting symptom. A thick, gelatinous exudate, which is predominately present in the basal portions of the brain, is the defining pathological trait of TBM. Cranial nerve trunks like the optic nerve, optic chiasma, and arteries of the circle of Willis are encased and strangulated by exudate. The cerebrospinal fluid (CSF) flow to the brain is also obstructed by basal exudate, which causes ventriculomegaly. In order to differentiate between the two common types of hydrocephalus i.e. communicating and obstructive on the basis of routine neuroimaging Computed Tomography (CT) scan and Magnetic Resonance Imaging (MRI) are done(2).

### Presentation:

A middle age female patient with, a known case of Hypertension(HTN) and TBM, came to the emergency(ER) department with complaints of headache for 3 weeks, high-grade fever, and gradual vision loss for one and a half months. No history of loss of consciousness or seizures. MRI was done at Nawab Shah Civil Hospital, which showed non-communicating Hydrocephalus and Ventriculitis for which she was taken to Zia Uddin Hospital. In Zia Uddin Hospital management of the patient started with the given diagnostic procedures; lumbar puncture was done; which showed some abnormalities. The patient took Leaving Against Medical Advice (LAMA) and arrived at Aga Khan University Hospital(AKUH) Emergency department on 1st Nov 2022. On arrival at AKUH, the

patient's Glasgow Coma Scale (GCS) was 7/15 for which she was immediately intubated, an urgent CT scan was done which showed a space occupying lesion in the left frontal lobe causing acute obstructive hydrocephalus. She was rushed to operation room for endoscopic septum Pellucidotomy + left External Ventricular Drain insertion and then shifted to Intensive care unit (ICU) for postoperative critical care.

**Diagnostic Criteria:**

Due to a lack of quick, reliable diagnostic testing, tuberculous meningitis diagnosis is often delayed, which negatively impacts the prognosis. The most extensively used and straightforward diagnostic test for diagnosing tuberculous meningitis is ziehl-neelsen staining, but its sensitivity varies significantly by region(3).

A brain biopsy is a procedure to extract an aberrant tissue sample for microscopic analysis. If an abnormality is detected on an MRI or CT scan, the tissue cells removed during the biopsy can reveal what kind of abnormality is present. There is significant pleocytosis with an increasing amount of lymphocytes, increase CSF protein level, and a marked reduction in CSF glucose levels (hypoglycorrhachia) in typical TBM(4). CT scanning and MRI are both utilized in the TBM to diagnose hydrocephalus. The preferred imaging method is a contrast CT scan, which revealed a space-occupying lesion in the left frontal lobe causing acute obstructive hydrocephalus. This gives us a piece of adequate information on subependymal seepage, the size of the ventricles, the presence of tuberculomas, and cerebral edema(2).

**Differential Diagnosis and Current Diagnosis**

Tuberculous Meningitis can be doubted with many differential diagnoses like; Encephalitis, Carcinomas, Stroke, Cerebral aneurysm, Collagen vascular disease, and lupus. The final medical diagnosis of our patient was post-TBM hydrocephalous because hydrocephalous is one of the most found one problems of TBM and is shown by literature that 80 percent of TBM patients develop Hydrocephalous as a complication(2).

**Pharmacological Management of the patient**

Medication	Indication	Dosage and Frequency
Inj. Levetiracetam	Prevent seizures associated with hydrocephalus	500mg Twice a day
Tab. Pyridoxine	To prevent the development of peripheral neuropathy	50mg Once a day
Inj. Dexamethasone	They are believed to lessen pressure inside the brain, which in turn lowers the chance of mortality by reducing inflammation of the surface of the brain and accompanying blood vessels.	6mg Twice a day
Inj. Vancomycin	Glycopeptide antibiotics	750mg Twice a day
Inj. Meropenem	β-lactam antibiotic for infection	2000mg Twice a day
Tab. Omeprazole	Indigestion, heartburn	40mg Once a day
Tab. Surbex Z	Vitamin B-Complex, Vitamin C, and zinc deficiencies.	1 tablet Once a day
Inj. Tramadol	For pain	25mg As needed

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## Non-Pharmacological Interventions

Two Surgical interventions were performed on this patient as per clinical indication:

1. Endoscopic septum Pellucidotomy
2. External Ventricular Drain (EVD) Placement

The septum pellucidum is a thin, bilateral membrane tissue that serves as the boundary between the lateral ventricles, an often utilized procedure for the surgical treatment of unilateral hydrocephalus is Endoscopic septum Pellucidotomy(5).

The most frequent and crucial life-saving procedure in a surgical intensive care unit is the placement of an EVD, which enables the removal of cerebral spinal fluid from the ventricles and into a sealed external environment. The regular intracranial pressure monitoring and CSF deviation offered by an EVD are beneficial for treating various acute brain injuries(6).

In this patient interval placement of ventricular drain with improvement in cystic dilatation present along the left lateral ventricles. Grossly unchanged edema along occipital and lateral ventricles with dilated temporal horns. There is re-demonstration of unchanged size of ventricles. Interval resolution of previously noted speck of air with re-demonstration of hemorrhage along the track of ventricular drain. The bi-frontal diameter currently measures 28.4 mm and previously measured 28.7 mm, showing no significant interval change.

## DISCUSSION

According to world health organization (WHO) each year 10.4 million cases of tuberculosis occur and of which the dissemination to central nervous system is 1 lakh in the form of Tuberculous meningitis(7). A review in Iran was done which shows that each year the cases of extra pulmonary TB are increasing day by day and 1651 cases were diagnosed of TBM in between the years of 2000 to 2021 only in Iran. Sistan, Baluchestan, South Khorasan, and Mazandaran had greater rates of TB meningitis than other provinces. Fever, anorexia, headache, stiff neck, loss of consciousness, and vomiting were the most typical signs of tuberculous meningitis(1). The frequent complication of TBM is hydrocephalus, which can occur in up to 85% of affected children. Children experience it more severely than adults do. There are two types of Hydrocephalous the communicating and the obstructive(8).

## Critical Points for Reflection

Due to the two times LAMA, this case was very unusual. The patient took LAMA once while aiming for a favorable prognosis and again because of a financial crisis. Due to poor adherence to the anti tuberculosis therapy (ATT) medications, our patient developed hydrocephalous post-tuberculous meningitis. Good ATT compliance is necessary to ward off miliary TB. Also, financial difficulties shouldn't affect the patient's prognosis. We tracked down the patient using our contacts, and the patient was successfully discharged.

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