



Case Report

A Rare Case of Pyogenic and Tuberculous Co-Infection

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Abstract

CNS co-infections by pyogenic and tuberculosis are uncommon infectious processes, with few cases reported to date. These superadded bacterial infections during CNS tuberculosis present usually atypical clinical manifestations. Bacterial meningitis is a rare but severe complication of patients with spondylodiscitis. CNS tuberculosis has a broad spectrum of disease patterns and a high risk of complications and mortality. Although bacterial infection of the central nervous system (CNS) is a life-threatening neurological emergency only few papers reported. Here We report a case of 48 year old diabetic male who was diagnosed with Neurotuberculosis with bacterial meningitis and cervical spondylodiscitis and treated with both Antibiotics and Anti-Tuberculous drugs and patient improved symptomatically.

Keywords: Bacterial meningitis, TB Meningitis, Cervical Spondylodiscitis, Anti-Tuberculous drugs.

Introduction

48year old diabetic male presented with complaints of high grade Fever and Neck Pain and occipital headaches for about 1 week. No past history of Tuberculosis. On Examination, Vitals were stable, CNS examination revealed GCS: 15/15, Neck Stiffness Present, Kernig's sign, Brudzinski's sign positive. Laboratory findings showed elevated total counts with polymorphs predominance, elevated blood sugars, deranged renal function test, normal liver function tests,

electrolyte panel, and urine routine showed plenty of pus cells. CRP:2.4, ESR:32. Mantoux test was negative. HIV serology was negative.

CSF Analysis showed WBC:1242 cells and Fluid Cytology revealed Neutrophils Predominant (80%), Glucose:149 (288), CSF/Serum Glucose: 0.5, Protein: 95, ADA:14. Blood Culture, Urine Culture and CSF Culture showed growth of Methicillin sensitive Staphylococcus Aureus. CBNAAT of sputum and CSF was found to be Negative. Sputum culture, AFB-1,2 – negative.

Patient was diagnosed as Acute Bacterial Meningitis and treated with IV Antibiotics (Ceftriaxone, Vancomycin), IV Steroids, Insulin and supportive management

In view of persistent neck pain and non resolution of symptoms despite 5 days of treatment, CE-MRI Brain was done and showed Abnormal Pachymeningeal enhancement with no significant dural thickening suggestive of Tuberculous Meningitis and CE -MRI Cervical Spine showed features of infective spondylodiscitis at C₇ -D₁ level with pre, paravertebral collection and anterior epidural collection- likely tubercular etiology.

Patient was diagnosed as Cervical Spondylodiscitis and Orthopedician advised for Conservative Management. FNAC from paravertebral space abscess which showed Necrotizing granulomatous lesions with secondary suppuration with possibility of tuberculosis, Culture and CBNAAT was negative. Patient was treated with Anti-Tuberculous drugs – Fixed Dose Combination - 4 and advised to continue for 12 months. Antibiotics were continued for 2 weeks and Dexamethasone was gradually tapered. Patient improved symptomatically.

On Follow up: Patient was clinically improved as evidenced by MRI Imaging which showed resolution of above findings.

Fig 1a

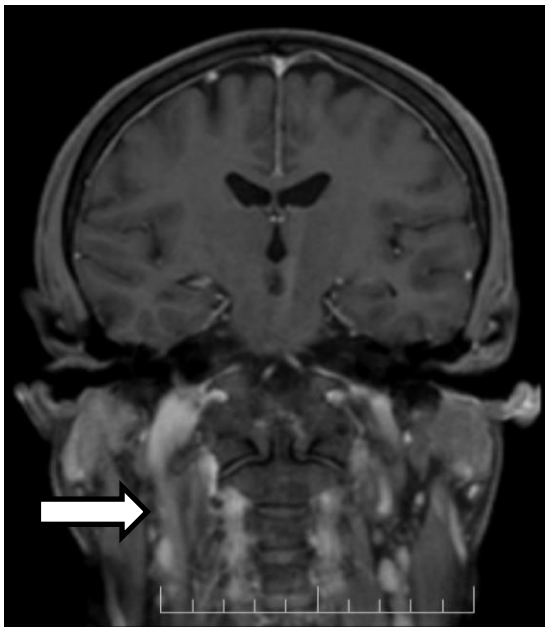


Fig 1b

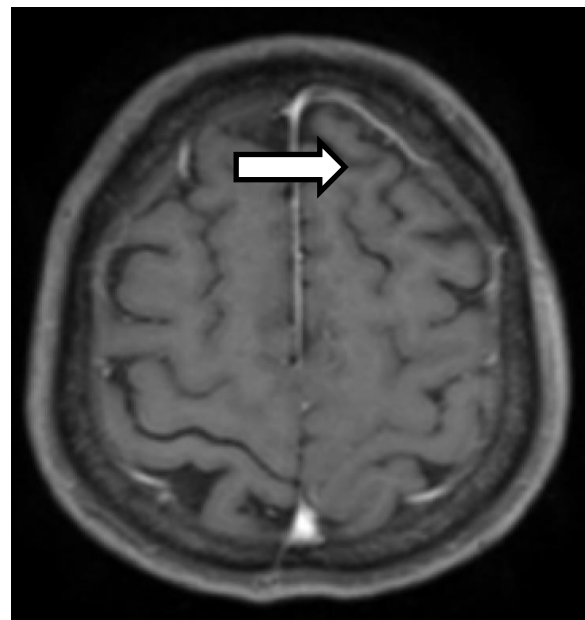


Fig 1a, Fig 1b : CEMRI BRAIN – showing Abnormal PACHYMENINGEAL enhancement with no significant dural thickening

Fig -2a



Fig 2b



Fig 2a, Fig 2b: CE MRI cervical spine showing infective spondylodiscitis at C7-D1 level with pre, paravertebral collection and anterior Epidural collection.

Fig -3

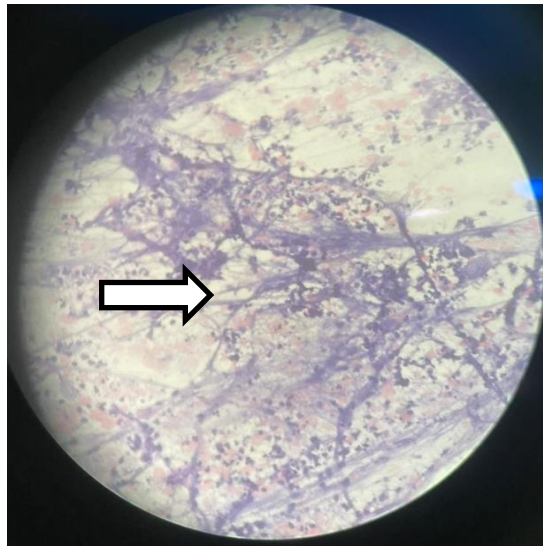


Fig -3 : FNAC showing Necrotizing granulomatous lesions.

Discussion

Meningitis, often identified by the clinical triad of fever, headache, and neck stiffness, takes various forms. Bacterial meningitis involves pyogenic inflammation of the meninges and subarachnoid cerebrospinal fluid (CSF)⁽¹⁾. Septic distribution through spread into the blood stream (bacteraemia) or cerebrospinal fluid (meningitis) may result in multiorgan failure and shock. Although bacterial infection of the central nervous

system (CNS) is a life-threatening neurological emergency only few papers reported⁽²⁾.

Bacterial meningitis is a rare but severe complication of patients with spondylodiscitis. The incidence of spondylodiscitis ranges from 0.2 to 2.4 per 100,000 people per year and is a serious disease associated with a significant morbidity and mortality rate ranging between 2 and 20%. The most frequent causative organism was *Staphylococcus aureus* which is known as one of

the most common organisms in pyogenic spine infection. The localization of discitis in the cervical spine and the presence of an epidural abscess seems to be a potential risk factor for developing an associated meningitis. There was a higher incidence both of cervical discitis (26.67%) and epidural abscess (60%)⁽²⁾.

CNS co-infections by pyogenic and tuberculosis are uncommon infectious processes, which present usually with atypical clinical manifestations. CNS involvement by tuberculosis (TB) is considered the most devastating form of extra-pulmonary involvement of disease, comprising 10% of all TB cases. CNS TB usually results from hematogenous spread, while direct spread from intra or extra-cranial focus is rare⁽³⁾.

Neurotuberculosis can present with meningeal form, which includes leptomeningitis and pachymeningitis, while the parenchymal forms include tuberculoma, tubercular cerebritis and abscess, tubercular rhombencephalitis, and tubercular encephalopathy. CNS TB is a rare manifestation of extra-pulmonary TB. It occurs in only around 10% of patients with systemic TB. The anti-tuberculous treatment (rifampicin, isoniazid, ethambutol, and pyrazinamide) provide prompt treatment and significant symptomatic improvement⁽⁴⁾.

Coinfection of pyogenic bacteria and CNS tuberculosis does not seem to increase the risk of death. In fact, no death was reported. Several comorbidities, alcoholism, type 2 diabetes and myelodysplastic syndrome, delayed diagnosis of Tuberculosis, CNS involvement, coinfection with HIV and other immunosuppressive factors aggravating risk factor for death⁽³⁻⁴⁾.

While CNS coinfection of pyogenic and tuberculosis bacteria although is an uncommon association, it should be considered in patients with immunosuppressive factors and atypical clinical manifestations. A high degree of suspicion

is mandatory in order to prevent a delayed diagnosis, which increases the risk of death⁽³⁻⁴⁾.

Treatment

Bacterial Meningitis, treated with IV Antibiotics with Steroids. Tuberculosis Meningitis, treated with Anti-Tuberculous drugs. In general, most cases of spondylodiscitis can be managed successfully only under antibiotic treatment.

Conflicts of Interest: Nil

References

1. Patel S, Jhala P, Sharma H (February 15, 2024) A Study of the Etiology, Clinical Profile, and Diagnosis of Various Types of Central Nervous System Infections in a Tertiary Care Center. *Cureus* 16(2): e54250. DOI 10.7759/cureus.54250
2. Janssen IK, Ryang YM, Wostrack M, Shiban E, Meyer B. Incidence and outcome of patients suffering from meningitis due to spondylodiscitis. *Brain Spine*. 2023 Aug 25;3:101781. doi: 10.1016/j.bas.2023.101781. PMID: 38020984; PMCID: PMC10668068.
3. Patricia V, Luis SHJ, Armando RPJ, Ibis DLC and Graciela C. CNS Bacterial Coinfections: An Uncommon Association of Tuberculous and Pyogenic Bacteria. *Austin J Clin Neurol* 2017; 4(6): 1127
4. Rehman S, Rehman A U, Naveed M A, et al. (December 28, 2021) Intracranial and Spinal Tuberculosis: A Rare Entity. *Cureus* 13(12): e20787. DOI 10.7759/cureus.20787.