

## TB or not TB: Not Always a Matter of Caseation

### Learning Objectives:

1. To recognize the great variation in clinical presentation of miliary tuberculosis.
2. To recognize that noncaseating granulomata may be formed by *Mycobacterium tuberculosis*.

### Case Presentation:

A 62 yo female with a PMH of hypothyroidism, CAD, schizoaffective disorder, neurosyphilis treated with penicillin, and PTE presented to an outside hospital with a 2 month history of progressive lower extremity weakness and failure to thrive. An MRI revealed a round, ring-enhancing intramedullary lesion at T2 and a CT revealed bulky retroperitoneal, pelvic, and cervical lymphadenopathy. An excisional biopsy of a cervical lymph node showed noncaseating granulomata. A diagnosis of sarcoidosis was made and the patient was discharged on dexamethasone. The patient continued to have a decline in functional status and presented to our institution one month later with altered mental status. An MRI of the brain revealed a small ring-enhancing lesion in the left thalamus, and CSF analysis showed 191 WBC (with mixed PMNs and lymphocytes) and an elevated protein level. The patient was treated with prednisone for presumed neurosarcoidosis. After 10 days of hospitalization without improvement, other diagnoses were considered and empiric 4 drug therapy for possible miliary tuberculosis was begun. The patient continued to decline and 4 days later progressed to fulminant cerebral edema and brain death. Posthumously, the CSF culture returned positive for *Mycobacterium tuberculosis*. An autopsy revealed noncaseating and caseating granulomata in the lungs and caseating granulomata in the axillary and para-aortic lymph nodes and the adrenal glands. Multiple tuberculomas were present in the spinal cord. The brain showed severe meningitis and numerous acid-fast bacilli present in the interpeduncular fossa. These findings were consistent with CNS tuberculosis.

### Discussion:

Miliary tuberculosis results from the lymphohematogenous spread of *Mycobacterium tuberculosis*. The clinical presentation can vary from septic shock with multi-system organ failure to adult failure to thrive or fever of unknown origin. Tuberculosis can involve virtually any organ system producing a variety of symptoms; however, general symptoms such as fever, night sweats, anorexia, weight loss, and malaise are common.

Despite advances in medicine, miliary tuberculosis remains a major diagnostic challenge. This contributes to the disease's current 30% mortality rate. When miliary tuberculosis is considered in the differential diagnosis, efforts should be made to obtain as much fluid and tissue as possible for analysis. The sensitivity for any one fluid/tissue sample for AFB stain/culture is low, so multiple samples are required to increase diagnostic accuracy. Imaging should be done to find lesions suitable for biopsy. On microscopic examination, caseating granulomata are classically identified. However, caseation depends on the host response and the stage of inflammation, so noncaseating granulomata may also be found. Finally, when the clinical suspicion is sufficiently high, empiric anti-tuberculosis therapy should be started.