CASE REPORT

Neuromelioidosis Masquerading as Acute Demyelinating Encephalomyelitis

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Background: Neuromelioidosis is a rare conduction, which is difficult to diagnose and treat. **Case characteristics:** Preadolescent girl presenting with prolonged fever, acute ascending paralysis and encephalopathy. **Outcome:** Neuromelioidiosis was confirmed on brain biopsy culture. Patient improved with an intensive antibiotic regimen. **Message:** Neuromelioidosis can mimic acute demyelinating encephalomyelitis clinically and radiologically.

Keywords: *Brain biopsy, Febrile encephalopathy, Ring enhancing lesion.*

Melioidosis is a tropical infection caused by *Burkholderia pseudomallei* [1]. Encephalomyelitis like presentation with quadriplegia and encephalopathy, evolving into focal suppurative central nervous system lesions, is very rare. We report a preadolescent girl with such a presentation.

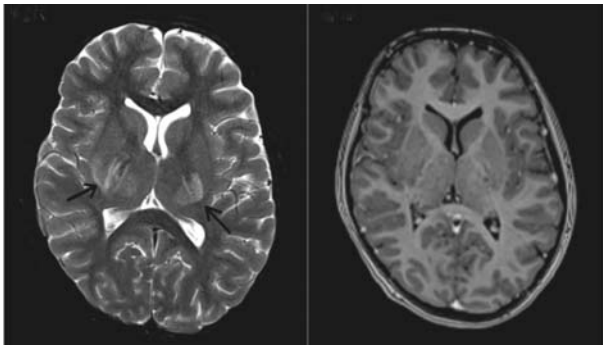
CASE REPORT

An 11-year old, previously healthy and developmentally normal girl, presented with a history of fever for twenty days and a left gluteal abscess that had been previously drained. Histo-pathological examination of the excised sinus tract of the above mentioned abscess revealed chronic inflammation. Pus culture and GeneXpert MTB/RIF were negative.

She continued to have fever and developed rapidly progressing ascending paralysis of all limbs with urinary retention. Neurological examination showed neck rigidity, flaccid paralysis with areflexia in both lower limbs and weakness of the upper limbs with preserved deep tendon reflexes. Plantar reflexes were absent bilaterally. Examination of the cranial nerves and sensory system were normal. She was treated empirically with Meropenem, Vancomycin and anti-tubercular therapy.

Her cerebrospinal (CSF) analysis revealed lymphocytic pleiocytosis (WBC-248 cells/µL, 92% lymphocytes), elevated proteins (69 mg/100 mL) and normal sugar. CSF AFB stain and GeneXpert MTB/RIF were negative, and Adenosine deaminase levels were normal. Hematological work-up revealed neutrophilc leuco-cytosis, high CRP and normal renal and liver function. HIV serology was negative. Contrast MRI of the brain and spine showed multiple asymmetric, non-enhancing T2 hyperintense lesions in the white matter of the brain and the entire spinal cord, which strongly favoured a diagnosis of Acute Disseminated Encephalomyelitis (ADEM) (***Fig.* 1a**).

Pulse methylprednisolone therapy was started for ADEM. Since blood, urine and CSF cultures were sterile, ceftriaxone was used as the sole antibiotics. Anti-tubercular treatment was continued. Over the next few days, she developed altered sensorium. Plasmapheresis was started on the 4th day after admission because of inadequate response to steroids. Even after three cycles of plasma exchange, she did not show signs of improvement and started having high-grade fever spikes. Repeat MRI brain and spine showed complete clearing of the spinal lesions, but new multiple ring-enhancing nodular lesions in both cerebral hemispheres, making the diagnosis of ADEM unlikely. Therefore, plasmapheresis and steroids were discontinued. Meropenem and vancomycin were restarted after sending



(a) *(b)*

FIG. 1 *(a) Axial T2-weighted MRI of the brain showing hyper intense lesions bilaterally in the basal ganglia and thalamus (arrows) done on the day of admission; (b) Axial T1-weighted post contrast MRI shows no focal enhancing lesions.*

repeat cultures from CSF, blood and urine. Empirical Amphotericin-B for fungal infection and Trimethoprim/Sulfamethoxazole (TMP/SMX) for Toxoplasmosis were added. All cultures were still sterile. CSF Galactomannan assay, India ink for Cryptococcus, Mycoplasma PCR and GeneXpert MTB/RIF were negative. Serology for Brucella, Toxoplasma and Mycoplasma were also negative. Repeat CSF examination continued to show lymphocytic pleocytosis (WBC-270 cells/μL, 98% lymphocytes).

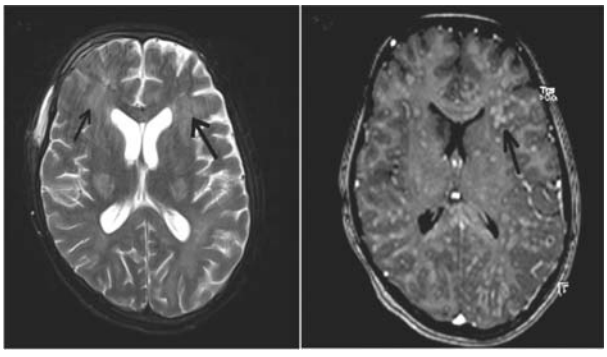
Due to continuing encephalopathy, a third MRI brain and spine was done on day 14, which revealed numerous small, ring-enhancing lesions in both cerebral hemispheres, thalami, midbrain and cerebellum (***Fig.* 2*b***). As the number of lesions had increased significantly and the patient continued to be encephalopathic, a brain biopsy (through right frontal craniotomy) was per-formed. Histopathology showed chronic granulomatous inflammation. Bacterial culture done by Vitek-2 (Biomerieux, France) from the biopsy sample grew *Burkholderia pseudomallei* and a definitive diagnosis of neuromeliodiosis was made. Ceftazidime and TMP/SMX were started intravenously. After one week of therapy, she became afebrile and her sensorium improved. At the end of 4 weeks she had significant neurological improvement; she regained power in her lower limbs and was interacting well with her parents. MRI brain showed a decrease in the number of enhancing lesions. She was discharged with a plan of eradication therapy with oral TMP-SMX and Doxycycline for one year. When the child came for follow-up, she was neurologically normal. Work up for immunodeficiency including serum immunuglobulins, flow cytometry and Nitro blue tetrazolium test were normal during follow-up.

DISCUSSION

Melioidosis is endemic in South East Asia and Northern Australia, and is under-diagnosed and under-reported in India [2,3]. Neuromelioidosis is very rare with less than 50 cases reported over the last 30 years [4]; however, mortality in neuromelioidosis is high [5]. The most common presentation of neuromelioidosis is mening-oencephalitis. It can also present as cerebral abscess (ring enhancing lesions), myelitis, monoparesis, paraparesis, cranial nerve palsies and can mimic Guillain-Barre syndrome [5].

Culture represents the diagnostic gold standard for melioidosis [1]. Treatment of neuromelioidosis includes parenteral antibiotics Ceftazidime or Carbapenem plus TMP/SMX for a minimum of 4 weeks, followed by oral eradication therapy with TMP/SMX plus/or Doxycyline for a minimum of 6 to 12 months [6]. In the present case, even though the presentation and radiological picture favored a diagnosis of ADEM, there were atypical findings in the CSF, clinical course and treatment response. Progression of neurological disease despite immunotherapy and persistence of fever prompted repeat CSF and serial imaging, which led to reconsideration of the provisional diagnosis of ADEM. Despite repeated negative cultures from blood and CSF we were able to isolate the organism from the brain biopsy sample.

This case highlights the importance of serial brain imaging and the utility of brain biopsy in cases where there is inadequate response to empirical treatment regimes.



(a) *(b)*

FIG. 2 *(a) MRI brain on day 14 of admission, axial T2 weighted image shows persisting hyperintense lesions bilaterally in basal ganglia and new confluent hyperintensities in the subcortical white matter in the bilateral frontal and parietal regions (arrows); (b) Axial T1-weighted post contrast MRI shows multiple small nodular and ring-enhancing lesions (arrow).*

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