

## Case Report

# Nontuberculous mycobacterial meningoencephalitis in a young healthy adult: A case report and literature review

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## Abstract

Nontuberculous mycobacterial (NTM) meningoencephalitis is a rare but clinically important opportunistic infection. In this case report, we present a rare case of NTM meningoencephalitis in a previously healthy 30-year-old male. This patient presented with a 6-month history of chronic headaches and the diagnosis of NTM meningoencephalitis was confirmed by surgical biopsy and polymerase chain reaction. In this article, we will also review NTM central nervous system infections with a focus on the radiologic findings.

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**Keywords:** Nontuberculous mycobacteria; Central nervous system infections; Meningoencephalitis; Opportunistic infections

## 1. Introduction

Central nervous system (CNS) infections by nontuberculous mycobacterium (NTM) are extremely rare and have been reported predominantly as case reports or in a case study format [1,4,8,9,11–15]. However, it is an important opportunistic infection because of the high mortality rate, ranging from 35% to 70% in immunocompromised patients [1]. Early diagnosis and treatment are essential in order to improve the patients' survival. In this regard, it is helpful to determine the radiologic features of NTM-CNS infection. Unfortunately, there have been few reports discussing the radiologic findings of the disease. We report a rare case of meningoencephalitis caused by NTM with a focus on imaging, as well as a summary of the radiologic features of NTM-CNS infection that have been reported so far. We believe that this

report will aid in the diagnosis and treatment of patients with NTM-CNS infections. Moreover, this is the first report in the English literature of a case of NTM-induced meningoencephalitis in South Korea, with a particular focus on the radiologic features.

## 2. Case report

A 30-year-old male visited a neurosurgery clinic due to a headache and posterior neck pain lasting for 1 week. On the computed tomography (CT) image of the brain, only subtle enlargement of both posterior horns and temporal horns of lateral ventricle was observed (Fig. 1, upper panel). Initial brain MRI showed subtle bilateral sulcal hyperintensities of the frontoparietal lobe and sylvian fissures on contrast-enhanced fluid attenuation inversion recovery imaging (CE-FLAIR) (Fig. 1, middle panel), and no abnormal enhancement on contrast-enhanced T1-weighted imaging (CE-T1WI) (Fig. 1, lower panel). A lumbar puncture was performed and the results of initial cerebrospinal fluid (CSF) analysis were within the normal range: colorless, no red blood cells, no

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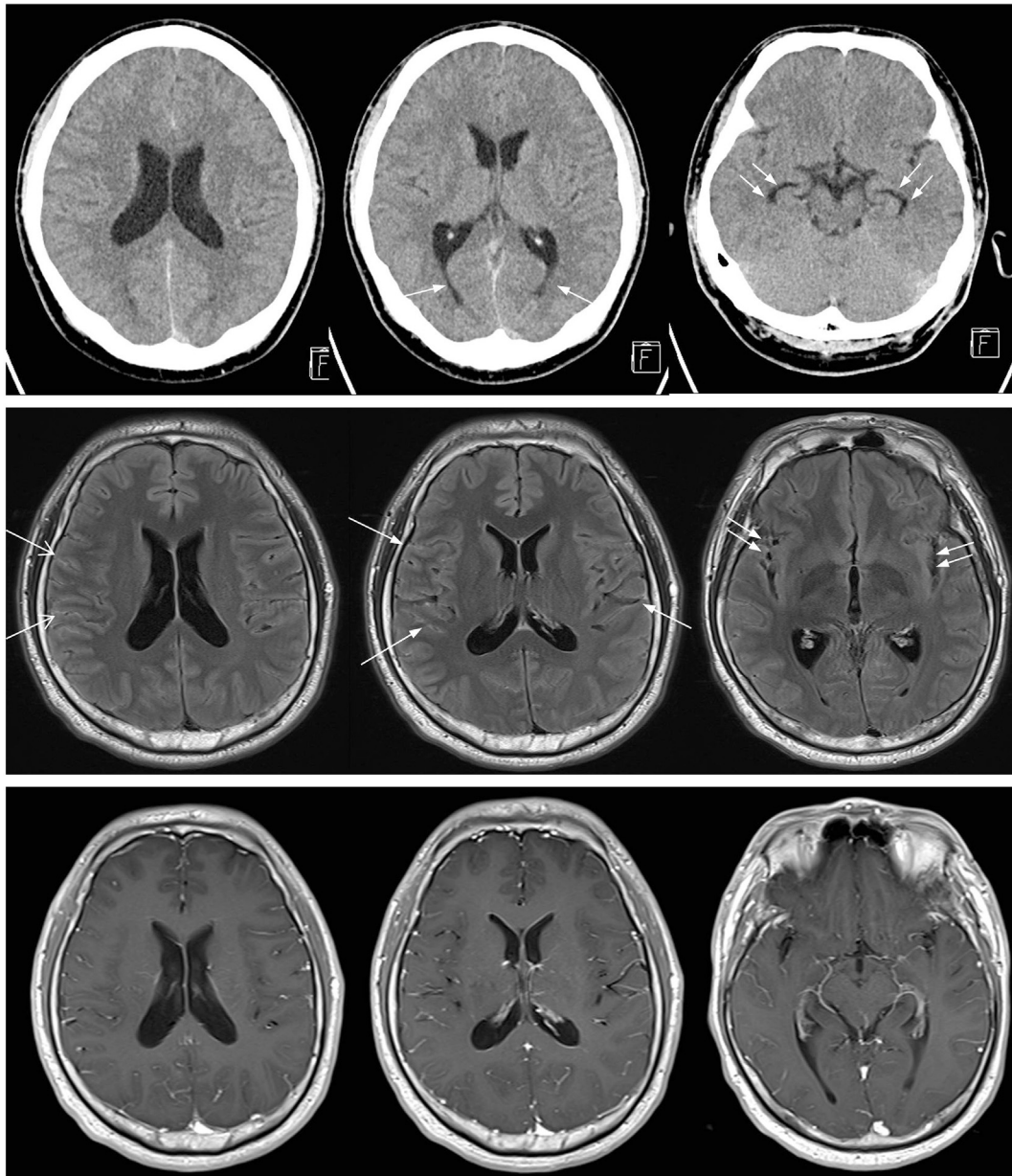


Fig. 1. NTM meningitis, presenting as hydrocephalus, in a 30-year-old male. (Upper panel) The initial brain CT scan showed subtle enlargement of both lateral ventricles including both occipital horns (arrows) and both temporal horns (double arrows). (Middle panel) Brain MR images of NTM meningitis showed bilateral sulcal hyper-intensity signals in the frontoparietal lobe (long arrows) and sylvian fissures (double arrows) on CE-FLAIR images. (Lower panel) Enhanced T1WI showed no demonstrable leptomeningeal enhancement.

white blood cells, total protein level of 16.6 mg/dL (normal range, 20–40 mg/dL) and glucose level of 32 mg/dL (normal range, 40–60 mg/dL). The patient had complained of a persistent headache that did not resolve with conservative treatment and the follow-up CT examinations showed gradual development of hydrocephalus over the course of three months (Fig. 2). Therefore, an external ventricular drainage catheter was inserted. At this stage, the patient voluntarily transferred to another hospital and a follow-up was not performed. After a further three months, the patient was admitted to the emergency room due to general motor weakness and dysarthria. The brain CT showed diffuse high-density lesions along the

cerebral sulci and cerebral cisterns, and diffuse strong leptomeningeal enhancement on contrast-enhanced CT, which was highly suggestive of meningitis (Fig. 3, upper panel). A lumbar puncture was performed and the results of CSF analysis were as follows: reddish color, few white blood cells (8/ $\mu$ L), elevated protein levels (93.87 mg/dL, with a normal range of 20–40 mg/dL), elevated glucose level (95 mg/dL, with a normal range of 40–60 mg/dL), and low levels of adenosine deaminase (ADA) (1.4 U/L, with a normal range of 5–20 U/L). These CSF findings were suggestive of meningitis. Diffuse high signal intensities were found in the subarachnoid space of the entire brain on T1WI, T2WI, and FLAIR. There were

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