



Cerebral nocardiosis in an immunocompetent patient: A diagnostic dilemma

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ABSTRACT

Nocardia are aerobic, partially acid-fast, branching filamentous Gram-positive bacilli, found in soil and decaying vegetables which are acquired by direct inoculation or inhalation. Nocardiosis generally affects the immunocompromised patients and has become a significant opportunistic infection as the number of immunocompromised individuals has grown worldwide. Nocardial cerebral abscesses are rare and account for about 1–2% of all cerebral abscesses. The insidious manifestations and paucity of clinical and laboratory signs of bacterial inflammation often prompt the diagnosis of neoplasia. Early biopsy of the lesion to achieve specific identification, anti-microbial sensitivity profiles and institution of appropriate treatment are important for positive outcome of nocardial infections. This is a case of a nocardial brain abscess in an immunocompetent patient which has posed a diagnostic dilemma as the causative agent was only managed to be isolated after multiple biopsies.

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1. Introduction

Nocardiosis generally affects the immunocompromised patients and has become a significant opportunistic infection as the number of immunocompromised individuals has grown worldwide. We present a case of nocardial brain abscess in an immunocompetent patient which had posed a diagnostic dilemma.

2. Case report

This is a case of a 45-year-old lady, with 2 weeks history of frequent headaches, poor memory and concentration, blurring of vision, personality change, as well as unsteady gait with poor coordination. There was loss of appetite with significant weight loss in the past 4 months. Central nervous system (CNS) examination revealed impaired upper motor neuron of the left seventh cranial nerve. A computed tomography (CT) scan of the brain on admission showed a ring enhancing lesion in the right frontal lobe with marked perilesional oedema, mass effect and hydrocephalus (Fig. 1). Magnetic resonance imaging (MRI) of the brain done 1 week later confirmed the ring enhancing lesion in the right frontal lobe and revealed further 2 smaller ring enhancing lesions in the right occipital and right periventricular region. Hydrocephalus was still present (Fig. 2). Magnetic resonance (MR) spectroscopy of these lesions demonstrated presence of lactate peak but no reversal of

choline and creatine ratio (Fig. 2c). Despite that, multiple brain metastases were diagnosed preoperatively and surgical intervention was planned.

She underwent biopsy which showed necrosis and inflammation, with no evidence of neoplasia or granuloma. Stains for bacteria, fungus and acid-fast bacilli were negative. Serology for toxoplasma, cryptococcus and retrovirus were all negative. Blood cultures for bacteria and fungus showed no growth. The patient was presumptively treated for toxoplasmosis. Patient underwent 2 more biopsies and excision of the right frontal lesion. Again the histopathological examinations of the specimens were inconclusive.

Serial imagings with CT and MRI however showed progression of the brain lesions (Fig. 3). On diffusion-weighted imaging (DWI), the central non-enhancing portion of the lesions returned low signal intensity on DWI and high signal intensity on the apparent diffusion coefficient (ADC) map which are not the typical appearances of pyogenic abscess collection on DWI (Fig. 4). CT of the rest of the body showed no other source of infection. Patient showed neurological deterioration 9 months into the course of her illness where she developed left hemiparesis, increased drowsiness and lethargy, but remained afebrile. She underwent a fourth craniotomy and biopsy. This time filamentous bacterium was seen in the GMS stain suggestive of actinomycetes, but the growth could not be sustained. The treatment for nocardiosis was started with TMP–SMX, Ceftriaxone and Doxycycline. After nearly a year in the hospital, she had shown clinical, biochemical and radiological improvement and currently is receiving her long-term treatment.

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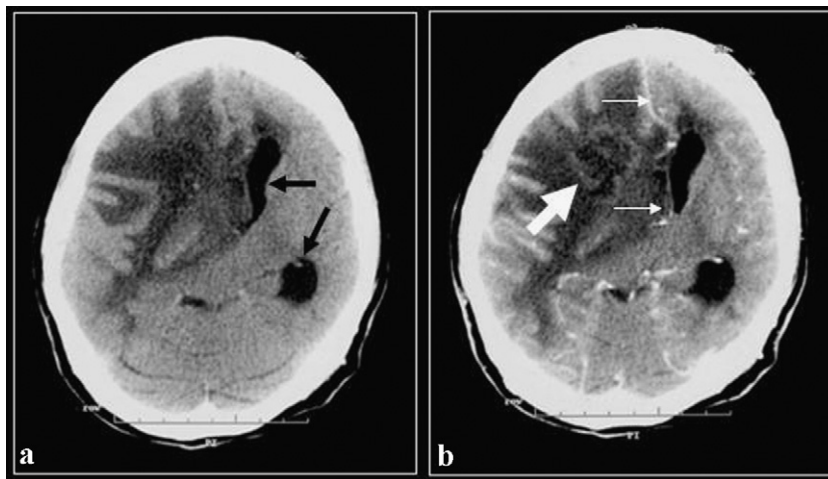


Fig. 1. (a) Plain and (b) contrasted CT of the brain (WW=80, WC=40) show a ring enhancing lesion (thick white arrow) in the right frontal lobe with associated marked perilesional oedema, mass effect and midline shift of 1.5 cm to the opposite side (thin white arrows). There is also contralateral hydrocephalus (black arrows).

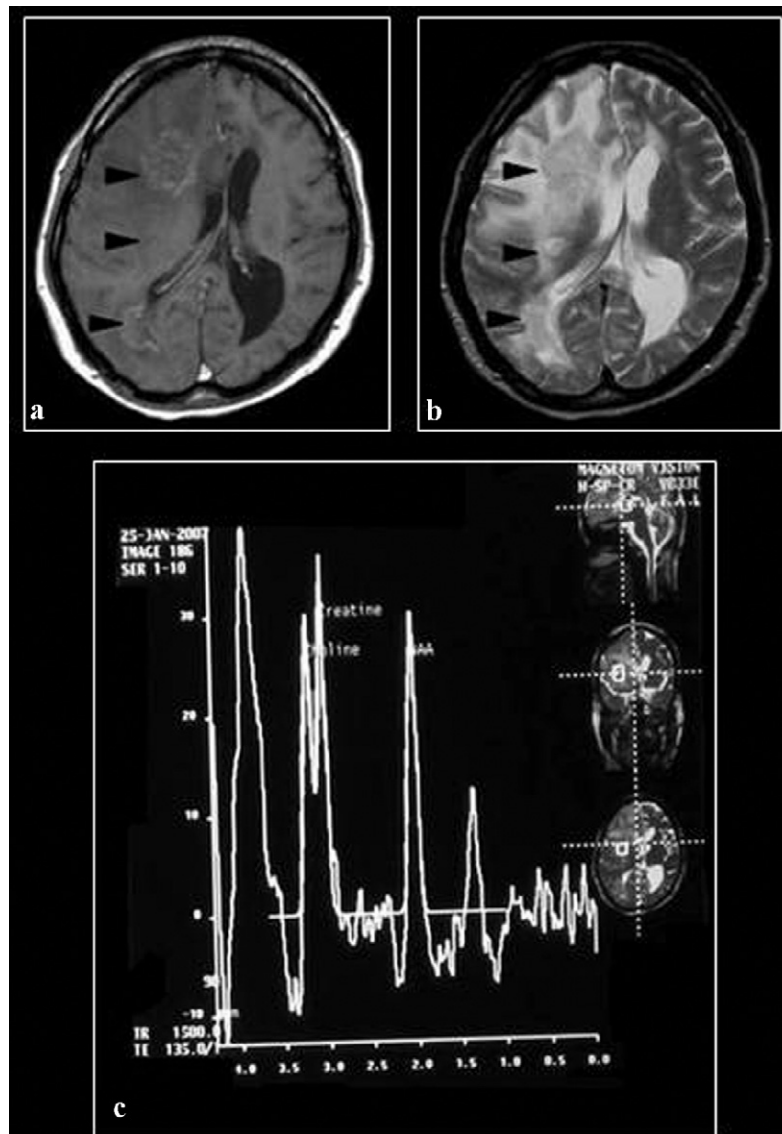


Fig. 2. MRI of the brain in (a) T1-weighted gadolinium enhanced (TR=735, TE=14); (b) T2-weighted (TR=3800, TE=90) sequences; and (c) MR spectroscopy. There are ring enhancing lesions (black arrowheads) in the right frontal lobe, right occipital and right periventricular region with extensive perilesional oedema, mass effect, midline shift to the left side and hydrocephalus. MR spectroscopy shows presence of lactate peak but no reversal of the choline and creatine ratio.

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