Case Report

Cerebral Aspergillosis Mimicking a Neoplasm in an Immunocompetent Patient

Abstract

Cerebral aspergillosis mostly presents as single or multiple abscesses with vascular invasion in immunocompromised patients. A rare mass like or tumoral form of cerebral aspergillosis has been described mostly in immunocompetent patients. A 22-year-old-male presented with recurrent attacks of complex partial seizures with secondary generalization, headache, and blurring of vision. Preoperative diagnosis of a cerebral neoplasm was considered in view of solid mass-like enhancement. However, histopathological examination was suggestive of central nervous system aspergillosis. The presence of imaging findings such as T2 hypointensity, irregular frond-like margins, and absence of choline peak may be the clues, which suggest a fungal etiology.

Keywords: *Aspergillosis, cerebral, magnetic resonance imaging, neoplasm*

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Introduction

Cerebral aspergillosis may occur due to hematogenous dissemination or by direct spread from paranasal sinuses.[1] In immunocompetent hosts usually the disease is not suspected based on clinical or imaging features.[2] We present a solid mass like presentation of cerebral aspergillosis in a 22-year-old-male where preoperatively a diagnosis of high grade glioma or lymphoma was suspected.

Case Report

A 22-year-old-male presented with recurrent attacks of complex partial seizures with secondary generalization for 1 month, headache and blurring of vision with diplopia for 20 days. The headache was bifrontal in nature, moderate-to-severe associated with irritability. There was no cough, fever, ear discharge, nasal stuffiness, diarrhea, or high-risk behavior. On examination, the patient was conscious and disoriented. Bilateral pupils were reacting to light. Fundus examination revealed bilateral Grade 1 papilledema. Facial deviation was present toward the left side; however, there was no facial hypoesthesia. The power was 3/5 in left upper and lower limbs. Sensory examination was normal. The laboratory findings were as follows: hemoglobin (Hb), 14.2 g/dl; total leukocyte count, 15,500/mm^3; differential leukocyte count, N70 E06 L20 M02; and serum creatinine, 1.1 mg/dl. HIV, viral markers, and diabetic workup were negative. Magnetic resonance imaging (MRI) brain was performed on a 3T scanner (Signa HDxT®, GE Healthcare, Milwaukee, Wisconsin). MRI showed a large T2 hypointense mass in the right temporal lobe with intense homogeneous postcontrast enhancement [Figure 1]. The margins of mass were irregular with frond-like projections. There was extensive perilesional edema with midline shift and uncal herniation. Another small enhancing nodular lesion was also noted in the right frontal lobe.

Right frontotemporal craniotomy identified a mass at depth of 1 cm from the surface. It was gray-white, firm, poorly suckable, and mildly vascular with the well-defined plane of cleavage. Mass along with temporal lobe was excised. The histopathological examination was suggestive of central nervous system (CNS) aspergillosis [Figure 2]. Microbiological examination also confirmed *Aspergillus* species. He was treated with Amphotericin B for 3 days, but due to drug reaction and hypokalemia, voriconazole was started. The patient was discharged in conscious and oriented state with persistent left hemiparesis and facial deviation.

How to cite this article: Neyaz Z, Singh V, Mehrotra A, Jain M. Cerebral aspergillosis mimicking a neoplasm in an immunocompetent patient. Int J App Basic Med Res 2018;8:269-71.

Received: 23 November 2017.
Accepted: 18 May 2018.

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Access this article online

Website: www.ijabmr.org

DOI: 10.4103/ijabmr.IJABMR_393_17

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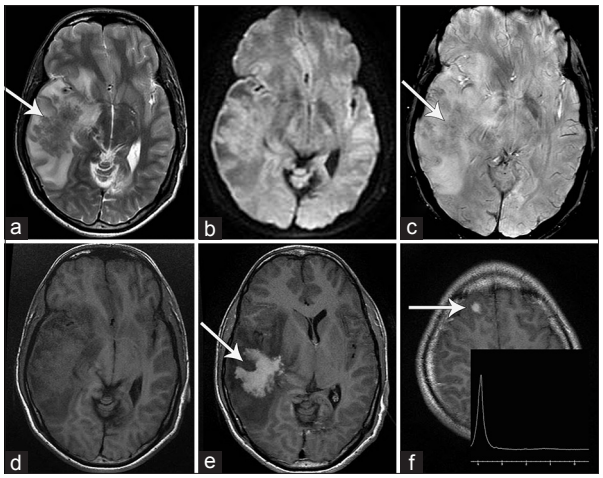

Figure 1: (a) T2-weighted image shows a hypointense mass (arrow) in temporal lobe with marked perilesional edema. (b) Diffusion-weighted image does not reveal diffusion restriction. (c) Lesion shows mild blooming (arrow) on susceptibility-weighted image. (d) Lesion is isointense to gray matter on noncontrast T1-weighted image. (e) Lesion shows homogeneous intense postcontrast enhancement. Margins of lesion are irregular with frond-like projections (arrow). (f) Another enhancing nodular lesion noted in the right frontal lobe (arrow). Inset show peak at 3.8 ppm on MRS from the temporal lobe lesion

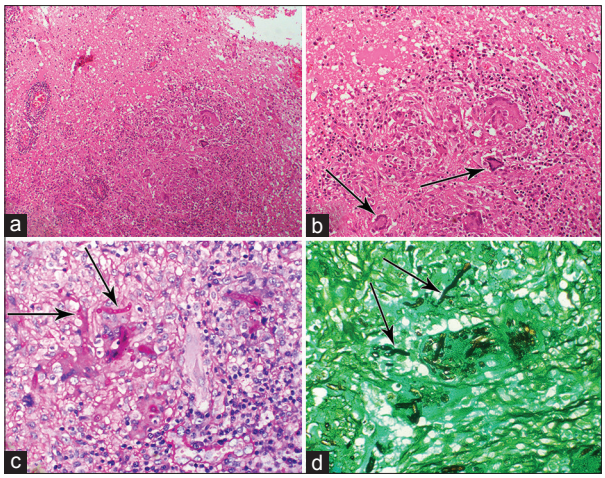

Figure 2: (a and b) Photomicrograph showing part of brain parenchyma replaced by granuloma comprising of multiple histiocytic giant cells (arrows) and lymphocytic infiltrates (H and E, ×100, H and E, ×200). (c) Multiple fungal hyphae (arrows) are seen (PAS, ×400). (d) Fungal hyphae are seen branching at acute angle (arrows) suggestive of *Aspergillus species* (CMS, ×400)

Discussion

Cerebral aspergillosis occurs mostly in immunocompromised patients with high mortality.[1-3] In immunocompromised patients, pathological examination usually reveals single or multiple abscesses with marked vascular invasion.[2] Recently, there is a rise in fungal infections involving CNS in apparently immunocompetent patients.[3] The immunocompetent hosts respond differently to the organism and generally present with granulomatous masses or meningitis. A rare mass like or tumoral form of cerebral aspergillosis has been described mostly in immunocompetent patients.[4-7]

In this case, due to the presence of solid mass-like enhancement diagnosis of a high grade glioma or lymphoma was suggested preoperatively. Retrospective analysis of MR images suggest some imaging features in favor of fungal infection like T2 hypointensity, irregular frond-like margins, and absence of choline peak. Hemorrhage is commonly seen in cerebral aspergillosis as low-signal intensity often at the periphery of the lesions on T2-weighted MR images.[1] Another reason for low T2 signal intensity is elevated levels of iron, magnesium, zinc, calcium, chromium, and nickel in *Aspergillus* colonies.[7] However, hypercellular neoplasms such as lymphoma may also be T2 hypointense. The fungal abscesses tend to have irregular walls with intracavitary projections; however, irregular frond-like outer margins has not been described.[8] In this case, there was a single prominent peak at 3.8 ppm, with absence of choline peak. Peaks at 3.6 and 3.8 ppm have been described in wall of fungal abscesses attributed to trehalose.[8] However, in this case, a single peak at 3.8 ppm could be due to mannitol, which was given to reduce brain edema. Mannitol has been described as a cause of potential pitfall for peak assignment on MR spectroscopy in a case of recurrent meningioma.[9]

To summarize, cerebral aspergillosis can occur in immunocompetent individuals and may mimic a cerebral neoplasm. The presence of imaging findings such as T2 hypointensity, irregular frond-like margins, and absence of choline peak may be the clues toward a fungal etiology.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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