Aspergillus Flavus as a Surprise CNS Space Occupying Lesion in an Immunocompetent Pediatric Patient

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Case report

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Abstract

Background: Fungal infections of the CNS are almost always a clinical surprise. Aspergillus species although ubiquitous are more frequently observed in immuno-compromised individuals, upon inhalation of conidia. Most of the fungal infections which happen in humans are opportunistic- in an immunocompromised host. However, we report the case of CNS fungal infection in a healthy child, without any co-morbidities, trauma, or medico-surgical intervention- which could have been the nidus of infection.

Case Presentation: We present the case of a 14 year old boy who presented to our institute's emergency department with primary concern of right sided body hemiparesis since twenty-four hours. This was a rapid-onset condition which was associated with gait disturbances and multiple episodes of vomiting. An MRI of the head showed encapsulated Space Occupying Lesion in the left frontal lobe with surrounding edema. The patient was planned for craniotomy to remove the intracerebral abscess. Histopathology report revealed presence of chronic granulomatous inflammation with necrosis and numerous septate hyphae. A fungus culture was run which confirmed presence of heavy colonies of Aspergillus Flavus. Post-operatively the patient was kept on Voricoazole and anti-inflammatory medications.

Conclusion: Fungal infections of the central nervous system are almost always a clinical surprise, and have subtle presentation. Any suspected lesion once removed should be sent for biopsy to rule out the presence of any fungal infection.

Introduction

Fungal infections of the central nervous system are almost always a clinical surprise, have subtle presentation and mistaken often as meningitis, brain abscess or tumor [1]. Albeit presenting predominantly in the immunocompromised individuals, a small cohort of healthy hosts may develop infection of this etiology. Even though patients can develop CNS fungal infection during trauma or intraoperatively, our patient had no predisposing disease or medico-surgical intervention which could have been the nidus of infection.

We discuss here, an unusual case of a fourteen year old boy who was received at the emergency with primary complaints of right sided hemiparesis. The parents informed that this condition started developing two days back and have progressed from mild weakness to significant gait disturbances. Additionally, the child was reported to have multiple episodes of vomiting and constant frontal headache over the course of these two days.

On examination, the child was conscious and well oriented to person, however, unable to register time and place. A magnetic resonance imaging of the brain was ordered which showed an encapsulated space occupying lesion with abscess in the left frontal lobe, surrounded by significant edema (Figure 1). In light of the radiological findings and the age group of the child, a preliminary diagnosis of high-grade glioma was made and the patient was referred to neurosurgery.

Peri-operatively, a non-vascular, hard, and encapsulated lesion was visualized in the left frontal lobe, extending medially to the falx cerebri. The entire lesion was resected and sent for detailed histopathology testing. While observing the cut-section of the lesion, a high suspicions of CNS fungal infection was raised, and the patient was started on intravenous Amphotericin, intravenous Paracetamol and intravenous Hydrocortisone to prevent the recurrence of the fungal infection (if any) and to resolve the inflammation.

The gross description of the biopsy revealed light brown, homogenous, nodular tissue, measuring approximately 3x2 centimeters. A detailed microscopic examination was carried out using Periodic acid–Schiff (PAS) special stain. The staining confirmed the presence of numerous septate fungal hyphae. A preliminary diagnosis of chronic granulomatous inflammation with necrosis was formed in light of numerous septate hyphae. The microbiology and infectious diseases department signed off this growth as heavy colonies of Aspergillus Flavus on the basis of the following results:

- Negative serum galactomannan
- Negative serum 1, 3-beta-d-glucan
- Gram stain showing few pus cells and rare septate hyphae
- Fungus culture confirmed presence of Aspergillus Flavus. (Figure 2)
- Negative acid fast bacilli staining

Aspergillus Flavus infection in the brain parenchyma can present as sudden onset headache and loss of consciousness, with or without any other symptoms of systemic infection such as convulsions, abnormal movements, eye abnormalities, vision impairment, drowsiness, weakness, fever, vomiting or skin rashes. However, patient can complain of facial pain, swelling, and impaired or compromised cranial nerve functions [2-4]. Sometimes, a palpable mass can be felt during the physical examination which could prompt a physician to investigate the presenting symptoms with the lesion, however, since the mass of our patient was deep in the brain matter, it couldn't be palpated.

Usually the brain lesion has heterogeneous enhancement and is surrounded by peri-focal edema as in our case. Imaging of such lesions can also show involvement of soft tissues with a midline shift opposite to the fungal cerebral mass [2,3]. Additionally, the tumor can invade and cause destruction of the facial bones, the cribriform plate and involve the facial sinuses- impacting the pachymeningeal layers.

A detailed histopathological examination is the key to diagnosis of any such mass. Microscopic examination, in case of fungal infections, can reveal many hyphae engulfed by multinucleated giant histiocytes and marked eosinophilia. The hyphae in the case of Aspergillus being dichotomous, hyaline, and septate with regular acute angle branching and vesical arising from conidiophores [4].

Although fungal infections are a mostly found in immunocompromised individuals who have co-morbidities such as neutropenia, uncontrolled hypertension or diabetes mellitus, it should be kept as differential when clinically evaluating a non-immunocompromised patient, in light of our findings.

Disclosures

Consent for publication: A written consent was obtained from the patient

Availability of data and materials: The corresponding authors would be highly obliged to share the relevant data and materials of this work on request of the journal's editor.

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Figures

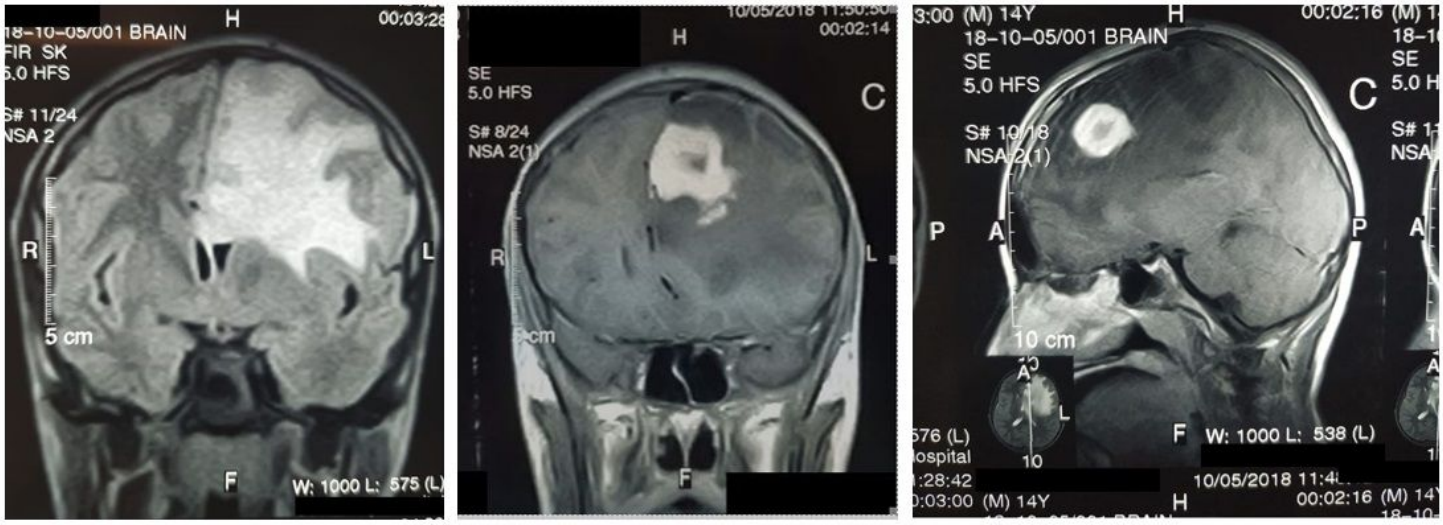

Figure 1

MRI Films of Frontal Lobe Mass

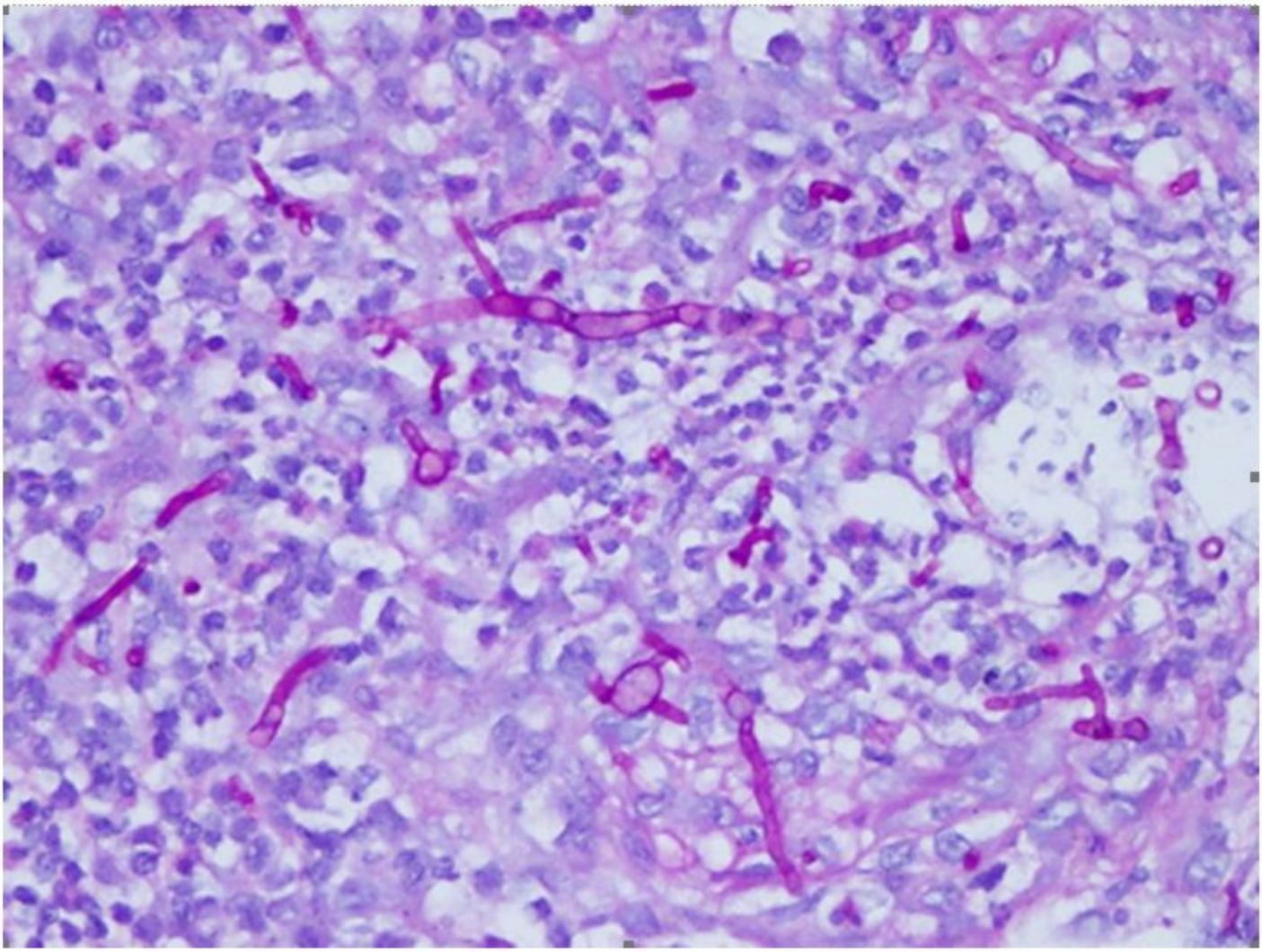

Figure 2

Histopathology Film of Resected Mass