

Cladophialophora bantiana brain abscess masquerading cerebral tuberculoma in an immunocompetent host

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Abstract

Phaeohyphomycosis is a term that collectively describes fungal infections caused by moulds and yeasts that have brown-pigmented cell walls (due to the presence of melanin). We report a case of 45 year female who had multiple coalescing lesions in the right basal ganglionic and thalamic region. Based on the imaging and investigation findings a diagnosis of cerebral tuberculoma was suspected. Histopathology of the excised specimen showed brown colored fungal hyphae surrounded by neutrophilic infiltrate. A diagnosis of phaeohyphomycosis caused by *Cladophialophora bantiana* was made and accordingly antifungal treatment was started. Brain abscess caused by *Cladophialophora bantiana* in an immunocompetent host is relatively

uncommon and usually associated with overall high mortality. The best outcomes have been reported in patients who receive both surgical excision of the abscess followed by systemic antifungal therapy. In view of its rarity of these lesions pre-operative diagnosis is difficult particularly in an immunocompetent host and absence of other risk factors.

Key words: Phaeohyphomycosis, cerebral, fungal infection, brain

Introduction

Phaeohyphomycosis infections is caused by dematiaceous fungi i.e., fungi that contain melanin in their cell walls. 1-3 *Cladophialophora bantiana* usually causes brain abscess in immunocompromised hosts. (1-4) Brain abscess caused by *Cladophialophora bantiana* in an immunocompetent host is relatively

uncommon. (1-3) In present article we discuss a case of brain abscess caused *Cladophialophora bantiana* in an immunocompetent host which was masquerading cerebral tuberculoma.

Case report

A 45 year female presented with the history of sudden onset of loss of consciousness for 10 minutes of 1 day back. While she regained the consciousness there was weakness of left upper and lower limbs, slurring of speech, difficulty in walking, moderate headache and multiple episodes of vomiting. There was no history of fever or seizures. There was no history of diabetes mellitus or any major illness in the past. At the time of examination she was conscious, dull and was obeying commands. Pupils were bilateral equal and reacting to light. Fundus showed mild papilledema and there was left upper motor neuron type of facial nerve palsy. There was weakness of left upper and lower limbs of grade 2/5 with exaggerated deep tendon reflexes. Left plantar reflex was extensor and right was flexor. All the blood investigations were normal except raised ESR (46 mm in 1st hour) and leukocytosis (18,000/mm³). Test for HIV was negative. Chest x-ray was normal. CT scan showed multiple coalescing lesions in the right basal ganglionic and thalamic region with significant perilesional edema and mass effect (Figure 1). Based on the imaging and investigation findings a diagnosis of cerebral tuberculoma was suspected and

she was started on ATT and steroids. On 3rd admission she suddenly lapsed into altered sensorium (GCS-E1V1M2), right pupil became dilated and non-reacting. An urgent MRI showed increase in cerebral edema and mass effect (Figure 2). The patient was taken for emergency decompressive right frontal craniotomy and biopsy of the lesions. There was ill-defined lesion with thin walled capsule with caseating material and yellowish non-foul smelling pus. Again an intraoperative diagnosis was tubercular abscess. Following surgery the patient was kept on elective ventilation. She was continued on anti-edema measures, anti-epileptics and was continued on ATT. There was no improvement in her condition. Histopathology showed brown colored fungal hyphae surrounded by neutrophilic infiltrate. Septate fungal hyphae were surrounded by neutrophilic infiltrate (Figure 3). A diagnosis of phaeohyphomycosis caused by *Cladophialophora bantiana* was made and accordingly antifungal treatment was started. However she did not respond to treatment and succumbed to the infection.

Discussion

Phaeohyphomycosis is a term that collectively describes fungal infections caused by moulds and yeasts that have brown-pigmented cell walls (due to the presence of melanin). (4)

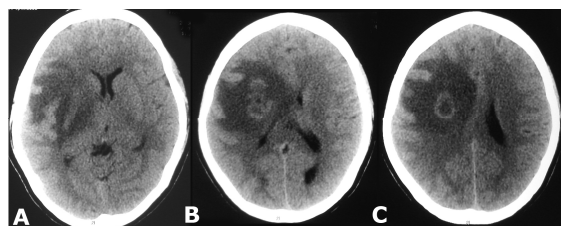


Figure 1

(A, B and C) CT scan brain showing multiple coalescing lesions in the right basal ganglionic and thalamic region with minimal peripheral enhancement, significant mass effect and midline shift

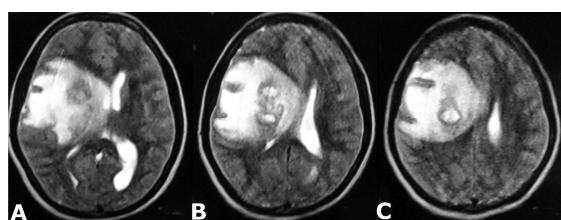


Figure 2

(A, B and C) MRI T2W sequences showing multiple ring shaped hyperintense lesions in right basal ganglionic and thalamic region with surrounding hypointense rim, extensive peri-lesional edema and mass effect

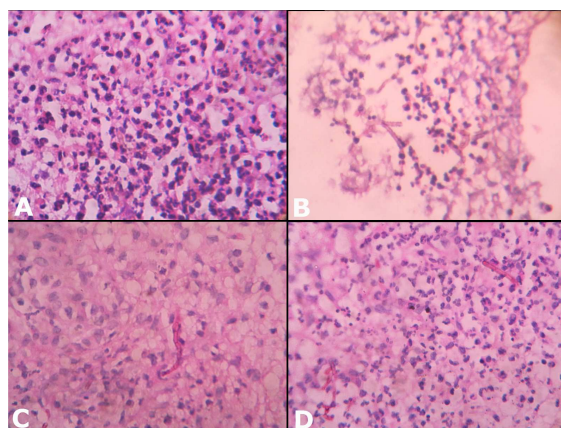


Figure 3

(A and B) Brown colored fungal hyphae surrounded by neutrophilic infiltrate (H&E, x400), (C and D) septate fungal hyphae surrounded by neutrophilic infiltrate (PAS, x400)

Cladophialophora bantiana has been implicated as a leading cause of cerebral

phaeohyphomycosis, and is a soil-based neurotropic fungus, which has affinity to glial tissue. (2) Although not clearly established, most probably the portal of entry is through respiratory tract. (2, 3, 5, 6) However, in the majority of patients of cerebral phaeohyphomycosis there may not be any evidence of sinus or lung disease. (7, 8) The exact pathogenesis of primary cerebral phaeohyphomycosis is presently unknown (9) and it has been suggested that the pathogenicity is primarily due to melanin (melanin is present in their cell walls and imparts the characteristic dark color to their conidia and hyphae) which scavenges free radicals produced by phagocytic cells. (2, 10, 11) Clinically phaeohyphomycosis can present from solitary subcutaneous nodules to life-threatening infections, brain abscess and disseminated disease. (3) As was seen in present case features of raised intracranial pressure (headache) followed by focal neurological deficits and/or generalized seizures are the most common presentation of *Cladophialophora* brain abscess. (2, 3) Because of its rarity it is difficult to make a pre-operative diagnosis of cerebral phaeohyphomycosis especially in an immunocompetent host. A number of commoner disorders (i.e. tuberculosis, cysticercosis, demyelinating disorders, pyogenic abscess, toxoplasmosis, fungal infections, neurosyphilis, sarcoidosis, Behcet disease, radiation encephalopathy, cerebral venous thrombosis and vasculitic disorders) including the immune status of the patient needs to be considered in the

differential diagnosis of ring-enhancing lesions on neuroimaging. (12-14) As we confronted in the case, presently there are no specific initial clinical or laboratory feature that makes a preoperative fungal abscess diagnosis possible. (2, 3, 15) The diagnosis is only possible once the tissue is submitted for the histopathological or microbiological examination. (2, 3) Because of the rarity of cerebral phaeohyphomycosis there are no standard guidelines for therapy and not many clinical trials comparing different treatment regimens. (2) The best outcomes were seen in patients who receive both surgical excision of the abscess followed by systemic antifungal therapy. (2, 5, 15) The combination of amphotericin B, 5-FC, and itraconazole has been suggested to improve survival; however only in few cases this triple combination is used. (1, 16-18) Newer anti-fungal agents (voriconazole and itraconazole) have been found to be effective for the management of these unusual lesions. (19, 20)

Conclusion

In summary, cerebral phaeohyphomycosis is associated with overall high mortality (around 70%) (2, 3, 15, 21) and the *Cladosporium bantianum* species has been reported particularly to be more virulent with poorer outcome. In view of its rarity of these lesions pre-operative diagnosis is difficult particularly in an immunocompetent host and absence of other risk factors. Till we find a better ways to diagnose such cases in advance we

need to depend on histopathology and microbiological investigations of the tissue.

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