SHORT REPORT

Multiple brain abscesses from isolated cerebral mucormycosis

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Abstract

A report is presented of a patient with cerebral mucormycosis without rhinocerebral or systemic evidence of the disease. The predisposing condition was drug-induced immunosuppression. Computed tomography (CT) showed focal areas of abnormal enhancement which correlated with necropsy findings of localised parenchymal brain damage; this represented encapsulated brain abscesses, a rare form of presentation of cerebral mucormycosis.

Mucormycosis is an opportunistic fungal infection that usually occurs in diabetics or immunocompromised patients.¹⁻³ The most common form of presentation is rhinocerebral, in which central nervous system involvement is secondary to extension from nasal-sinus and orbital disease.² On rare occasions, isolated cerebral mucormycosis has developed from haematogenous spread;⁴⁻⁶ in most of these patients it could be related to intravenous

heroin abuse. We report a patient with prednisone and cyclophosphamide-induced immunosuppression who developed cerebral mucormycosis without any other evidence of the disease.

Case report

A 33 year old woman with systemic lupus erythematosus and diffuse glomerulonephritis was evaluated at the Neurological Institute in Mexico one week after the onset of fever, headache and somnolence. She had been receiving prednisone and cyclophosphamide for the previous five months. On admission the patient was lethargic but moved all limbs in response to pain. There were generalised hyperreflexia, bilateral Babinski's signs, and nuchal rigidity. General physical examination was notable for alopecia and multiple ecchymoses in upper and lower limbs. CT scan showed hydrocephalus. After contrast medium administration, two areas of abnormal enhancement appeared; one in the left parietal lobe, the other in the right frontal lobe (fig 1).

Figure 1 Contrasted CT scans display hydrocephalus and two areas of abnormal enhancement (arrows) in brain parenchyma: one in the left parietal lobe (a), the other in the right frontal lobe (b). Also shown is hydrocephalus secondary to the posterior fossa lesion.

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Figure 2 (a) Low power view of the abscess in the subcortical white matter. The necrotic centre shows a well defined collagen capsule and marked inflammatory reaction at the periphery. Notice the pallor of the myelin. Klüver-Barrera technique $\times 30$. (b) Low power photomicrograph of the abscess. Abundant hyphae appear in the vicinity of the collagen capsule HE $\times 60$. (c) High power photomicrograph to show the detailed characteristics of the monoseptate fungal hyphae. HE $\times 400$. (d) Astrocytic gliosis in adjacent nervous tissue to abscess. HE $\times 400$.

The following day the patient was comatose, the pupils were fixed and dilated, and oculocephalic reflexes were absent. She became hypotensive and died from cardiac arrest.

Necropsy examination of the brain showed diffuse oedema of cerebral hemispheres, multiple areas of subarachnoid bleeding, and tonsillar herniation. Coronal sections revealed hydrocephalus and four focal suppurative lesions: one in each cerebral hemisphere (the left parietal lobe and the right frontal lobe), one in the wall of the third ventricle, and the other in the right cerebellar hemisphere. Histological examination of the lesions showed a necrotic centre surrounded by a capsule composed of collagen, enlarged blood vessels, and abundant mononuclear cells. In addition, multiple non-septate fungal hyphae consistent with mucormycosis were present throughout the capsule. Gliosis, oedema, and vacuolated nerve fibres

were identified in perilesional white matter (fig 2).

Discussion

In its common rhinocerebral form, mucormycosis is associated with acute meningo-encephalitis and orbital apex or cavernous sinus syndromes secondary to naso-orbital gangrene.^{1,2} In addition, the specific predilection of causative organisms (Phycomycetes) for invading arteries and veins leads to multiple infarctions in brain parenchyma.⁷ On the other hand, cerebral involvement related to haematogenous spread from distant infection is most often associated with localised suppuration deep in the brain.¹ In such cases, focal areas of cerebritis rather than encapsulated brain abscesses occur indicating the inability of immunocompromised hosts to confine the infectious process.⁸ In this case the lesions were

well encapsulated brain abscesses (fig 2) without any pathologically demonstrable vascular lesions.

Isolated cerebral mucormycosis in the setting of drug-induced immunosuppressions is rare, with only two cases previously reported.^{9 10} In our patient, cerebral involvement occurred without evidence of rhinosinusitis, orbital or lung infection, although a primary cutaneous infection at the site of cyclophosphamide injection cannot be completely excluded. This route of infection has occasionally been reported in diabetics or leukaemia patients in the site of insulin or corticosteroid injection.²

Mucormycosis usually has a lethal outcome.¹⁻⁶ Nevertheless, a favourable response has been reported in selected patients after appropriate surgical and medical therapy.² Early diagnosis based on a high level of suspicion would improve prognosis in some cases.

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