Neurol J Southeast Asia 2003; 8 : 41 – 43

Symptomatic cryptococcal radiculopathy in an immunocompetent patient

Heng Thay CHONG, Khean Jin GOH, *Norlisah RAMLI, Chong Tin TAN

*Departments of Medicine and *Radiology, University of Malaya, Kuala Lumpur.*

Abstract

A 21 years old man previously in good health presented with headache and papilloedema. Cerebrospinal fluid confirmed the diagnosis of cryptococcal meningitis with *cryptococcus neoformans* shown in smear and culture. The HIV serology was negative and CT brain scan was normal. He was treated with amphotericin B and fluconazole, repeated lumbur puncture and ventriculo-peritoneal shunt to relieve the intracranial hypertension. On day 35 of admission, he complained of tenesmus, left thigh and abdominal pain. There was painful limitation of straight leg raising on the left side with absent ankle reflexes on both sides. MR imaging showed meningeal contrast enhancement in lumbo-sacral cord and caudal equina. Electromyography showed absent H reflexes bilaterally, and reduced F wave persistence in common peroneal and posterior tibial nerves. He was treated with further courses of antifungal drugs. The symptoms eventually subsided with return of the H reflex.
Conclusion: Cryptococcus neoformans can cause spinal meningitis with symptomatic radiculopathy.

INTRODUCTION

Cryptococcus neoformans is a common cause of meningitis in both the immunocompromised and the immunocompetent patients. It is one of the commonest causes of meningitis in Malaysia.[1, 2] Clinically up to 20% of patients have generalized areflexia suggesting concomitant radiculopathy.[1] Abnormal nerve conduction study is reported in up to 93% of the patients in one series of 14 consecutive immunocompetent patients with cryptococcal meningitis, in which 61% had abnormal H reflexes, and 43% delayed median nerve F waves latencies.[3] It is hypothesized that cryptococcal infection may involve the meninges of the spinal cord and thus causes a radiculopathy.[3] However, symptomatic radiculopathy has not been previously reported. We describe here a case of symptomatic cryptococcal radiculopathy in an immunocompetent patient whose spinal meningitis was confirmed by MR imaging.

CASE REPORT

LSL, a previously healthy 21 year-old Chinese man was referred for a 3 weeks history of headache, giddiness, nausea and vomiting. The headache was temporarily relieved after vomiting. At presentation, he was afebrile, with hyperreflexia on the right upper and lower limbs but no weakness. He also had bilateral papilloedema with normal visual acuity. Investigations showed a mild leucocytosis of 12,400 cells/ml. Serum electrolytes, renal and liver function tests, chest X-ray, CT brain scan were normal, and ELISA for HIV was negative. Lumbar puncture showed an opening pressure of greater than 50 cm H_2O. The cerebrospinal fluid was clear in appearance, with 106 erythrocytes / µl, 62 leucocytes/µl with 97% lymphocytes, glucose of 2.9 mmol/l, and protein of 0.36 g/l. Indian ink was strongly positive for encapsulated yeast, and the culture grew *Cryptococcus neoformans*. Subsequent cerebrospinal fluid examination showed positive cryptococcal antigen at 1:1024 dilutions. He was treated with intravenous amphotericin B (7 mg/kg/day) and fluconazole (400 mg/day). He developed generalized tonic-clonic seizure while on treatment, which was controlled with benzodiazepine and phenytoin, and an episode of right subclavian venous thrombosis complicating the insertion of central venous catheter. He had almost daily lumbar puncture to relieve the intracranial hypertension[2] until a ventriculo-peritoneal shunt was inserted on day 24 of admission. His cerebrospinal fluid examination on day 25 of admission showed 1580 erythrocytes/ µl, 2 leucocytes/µl, glucose of 1.9 mmol/l and

Address correspondence to: Dr HT Chong, Neurology Laboratory, University Malaya Medical Centre, 59100 Kuala Lumpur, Malaysia. Fax: 603-79502968

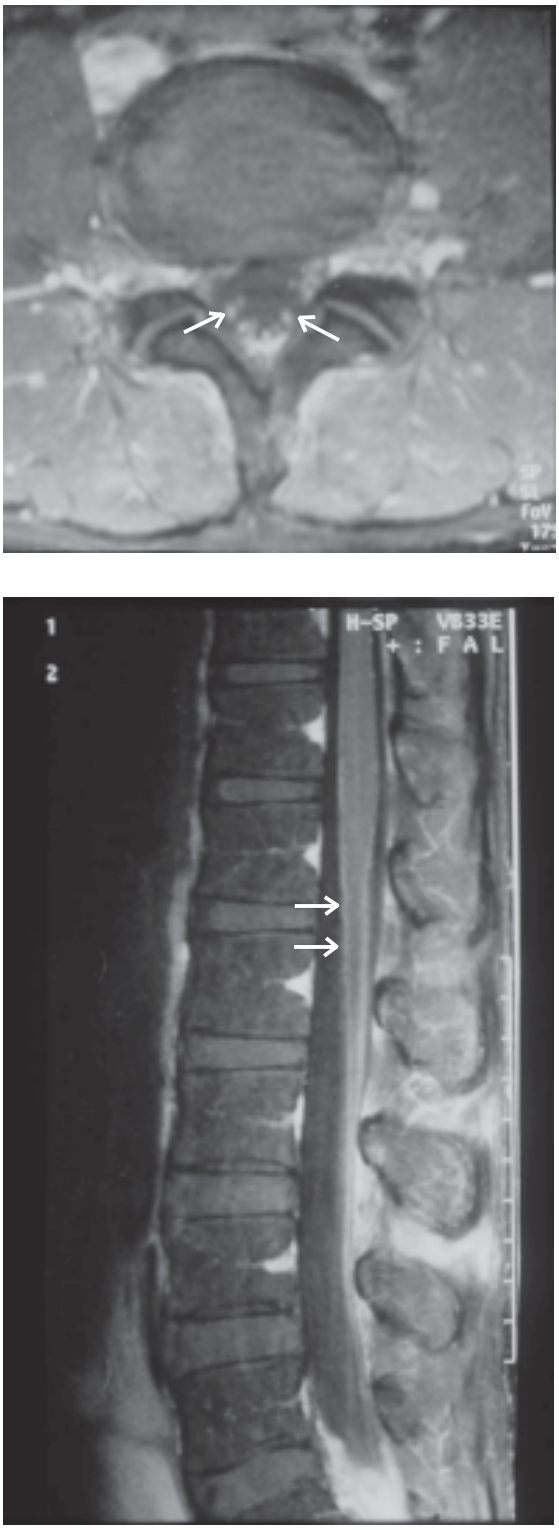

Figure 1. T1 weighted and contrast enhanced MR imaging with saggital (Panel A) and axial (Panel B) views showing linear enhancement in the meninges covering the lumbo-sacral spinal cord (Panel A, arrows) and roots of caudal equina (Panel B, arrows) indicating pial involvement.

protein of 0.54 g/l with occasional encapsulated yeast seen on microscopy. There was no growth on bacterial medium after 48 hours.

The cerebrospinal fluid on day 30 showed 940 erythrocytes/µl, 86 leucocytes/µl (100% polymorphs), glucose of 1.8 mmol/l and protein of 0.95 g/l. On day 35 of admission, he complained of tenesmus, left thigh and abdominal pain. On examination, there was painful limitation of straight leg raising on the left side with absence of both ankle reflexes. The muscles power was normal, and Babinski response was flexor. There was no fever. Lumbosacral x-ray was normal. The MR imaging showed linear enhancement in the meninges covering the thoracic, lumbo-sacral spinal cord and roots of caudal equina indicating pial involvement (figure 1). Electromyography showed absent H reflexes bilaterally, and reduced F wave persistence in common peroneal and posterior tibial nerves. The cerebrospinal fluid cultures for bacteria and tuberculosis were repeatedly negative. He was diagnosed to have a spinal and cauda equina cryptococcal meningitis. The amphotericin B and fluconazole was continued, and no other antibiotic was given. He recovered from the thigh and abdominal pain over a month. He was finally discharged after 3 months of hospital stay. He was last seen as outpatient 7 months after the initial presentation. He remained well without recurrence of the meningitis or radiculopathy except for absent ankle reflex on the right. A repeat nerve conduction study a month after discharge showed that the H reflexes, F waves, the lower limbs motor and sensory action potentials were all normal.

DISCUSSION

This patient has symptomatic radiculopathy affecting the left lower thoracic, lumbar and sacral nerve roots. This was confirmed by electromyography. MR imaging also confirmed the meningeal involvement of the lumbo-sacral spinal cord and cauda equina. There was no evidence of superimposed infection from other microorganism. He had remission with treatment for *cryptococcus neoformans* only. Thus, the lumbar and sacral meningitis was likely to be due to cryptococcal infection.

Tan and Kuan[1] reported that 20% of their cryptococcal meningitis patients had generalized areflexia, Ng and Tan[3] reported 36% of a cryptococcal meningitis series being hyporeflexic. In an electromyographic study of 14 patients, 13 (93%) had electrophysiological evidence of radiculopathy, even though all of these patients were asymptomatic. The changes were abnormal H reflex (61%), small motor or sensory action potentials, and delayed F waves.[3] Previous pathological study has shown *Cryptococcus neoformans* to be ubiquitous, involving brain as well as spinal cord, spinal nerve roots and the leptomeninx.[4] However, various previous clinical studies involving large number of patients have not showed symptomatic radiculopathy.[5-8] This is the first report of a symptomatic cryptococcal radiculopathy from spinal meningitis in an immunocompetent patient, confirmed by MR imaging. This case shows that *cryptococcal neoformans* can cause spinal meningitis with symptomatic radiculopathy.

REFERENCES

1. Tan CT, Kuan BB. Cryptococcus meningitis, clinical-CT considerations. *Neuroradiology* 1987;29:43-6
2. Tan CT. Intracranial hypertension causing visual failure in Cryptococcal meningitis. *J Neurol Neurosurg Psychiatry* 1988;51:944-6.
3. Ng WK, Tan CT. Peripheral nerve involvement in immunocompetent hosts with Cryptococcal meningitis: a clinical and electrophysiological study. *Neurol J Southeast Asia* 1996;1:33-7
4. Weenik HR, Bruyn GW. Cryptococcosis of the nervous system. Vinken PJ, Bruyn GW, eds: Handbook of Clinical Neurology: Volume 35, Infections of the Nervous System Part III. Elsevier/ North-Holland Biomedical Press. 1978:459-502.
5. Wu G, Vilchez RA, Eidelman B, Fung J, Kormos R, Kusne S. Cryptococcal meningitis: an analysis among 5521 consecutive organ transplant recipients. *Transplant Infectious Disease* 2002; 4:183-8.
6. Jean SS, Fang CT, Shau WY, Chen YC, Chang SC, Hsueh PR, Hung CC, Luh KT. Cryptococcaemia: clinical features and prognostic factors. *Q J Med* 2002;95:511-8.
7. Vilchez RA, Fung J, Kusne S. Cryptococcosis in organ transplant recipients: An overview. *Am J Transplantation* 2002;2:575-80.
8. French N, Gray K, Watera C, Nakiyingi J, Lugada E, Moore M, Lalloo D, Whitworth JAG, Gilks CF. Cryptococcal infection in a cohort of HIV-1-infected Ugandan adults. *AIDS* 2002;16:1031-8.