

Neuroimaging Highlight

Bilateral Midbrain and Thalamic Hemorrhage in Wernicke Encephalopathy

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CASE PRESENTATION

A 34-year-old man with acute lymphoblastic leukemia was admitted for management of fever, cough, sputum, and diarrhea and was treated with antibiotics including pentamidine, meropenem, and voriconazole for *Pneumocystis carinii* pneumonia, bacteremia, and fungal infections. One month before admission, the patient received salvage chemotherapy with high-dose cytosine arabinoside, mitoxantrone, and etoposide. The patient was also treated with intravenous glucose and electrolyte solution without vitamin supplementation because of diarrhea.

After two weeks of hospitalization, the patient developed gradual mental deterioration, confusion, and irritability and was referred to the neurology department. On examination, he had bilateral limb ataxia, his left eye was deviated to the left upper side, and ocular movements were limited in all directions with no vestibuloocular reflex on doll's eye test. The patient's upper and lower limbs were symmetrically hypotonic and weak. Brain CT on the day of referral revealed hemorrhage in the bilateral midbrain tectum (Figure 1A). MRI showed more typical lesions on the bilateral thalami and periaqueductal area

with atypical hemorrhage in the bilateral midbrain tectum and medial caudal thalamus on T2*-weighted and gradient echo images (Figure 1B-F). Two days after beginning thiamine supplementation, the patient's consciousness began to improve and extraocular movement exhibited some improvement, accompanied by newly developed bidirectional horizontal nystagmus. Despite these partial improvements in the symptoms of Wernicke encephalopathy, he eventually died from refractory recurrent infections and septic shock.

Macroscopic hemorrhage is rarely observed within the lesions of Wernicke encephalopathy. And hemorrhage is known to be associated with poor prognosis.^{1,2}

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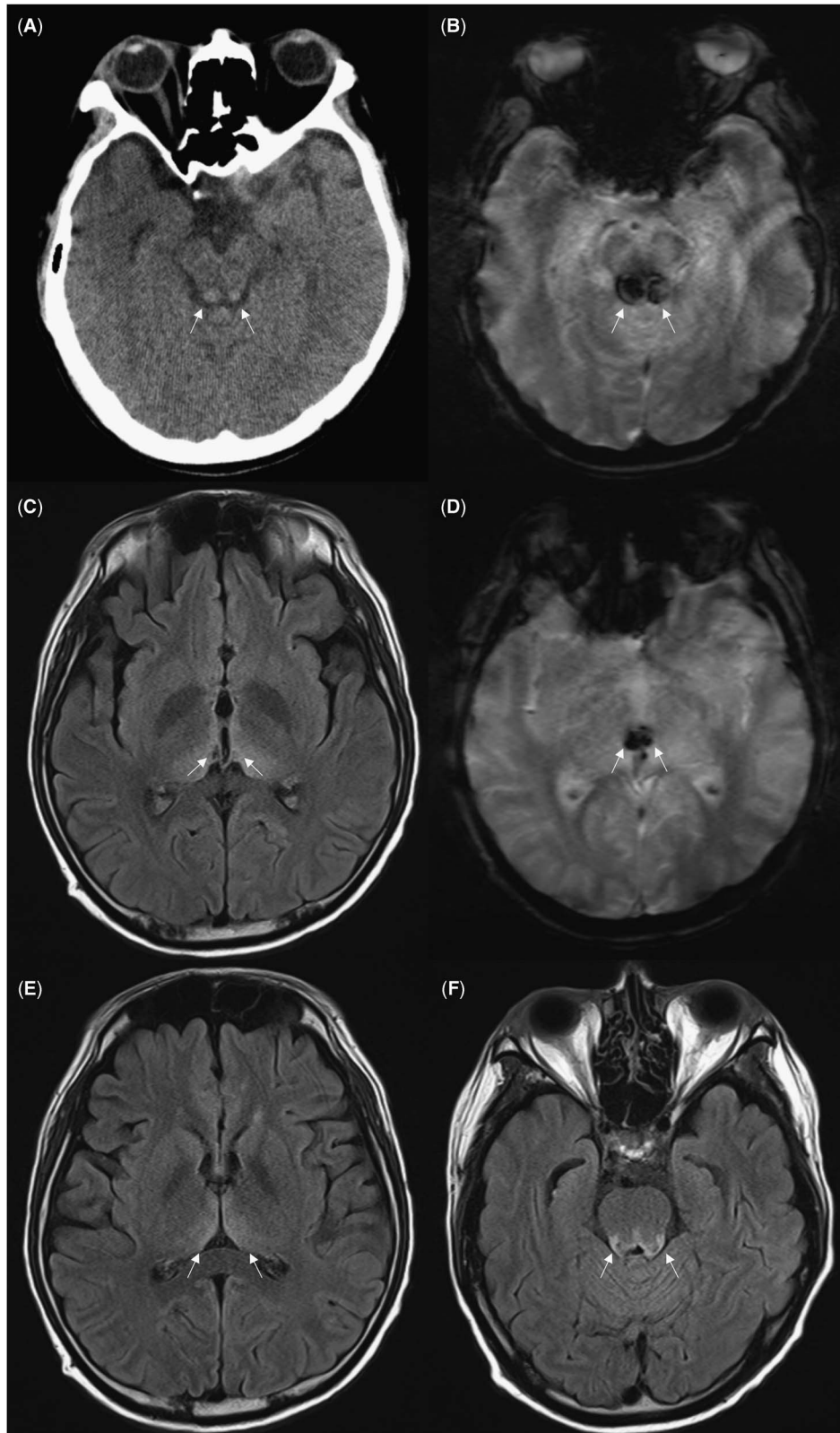


Figure 1: (A) Brain CT and (B) axial T2*-weighted gradient echo MRI demonstrate bilateral midbrain tectal hemorrhage (arrows). (C) Axial fluid-attenuated inversion recovery and (D) T2*-weighted gradient echo MRI demonstrate bilateral medial thalamic hemorrhage (arrows). (E, F) More typical high-signal-intensity lesions of Wernicke encephalopathy on the bilateral paramedian thalami and periaqueductal area are visible on fluid-attenuated inversion recovery MRI (arrows).