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The Clinical Picture

A woman with headache and blurred vision

A 61-YEAR-OLD WOMAN with non-small-cell lung cancer was treated with paclitaxel, carboplatin, and the experimental drug erlotinib in a phase 1 clinical trial. She completed induction chemoradiotherapy, followed by lobectomy. Forty days after surgery she presented with headache, blurred vision, nausea, and vomiting, which had begun 1 week earlier. She had a waxing and waning change in mental status. Her blood pressure was 175/95 mm Hg. Neurologic examination revealed mild expressive aphasia with occasional word-finding difficulties, and a wobbly gait. Magnetic resonance imaging (MRI) of the brain was ordered (FIGURE 1).

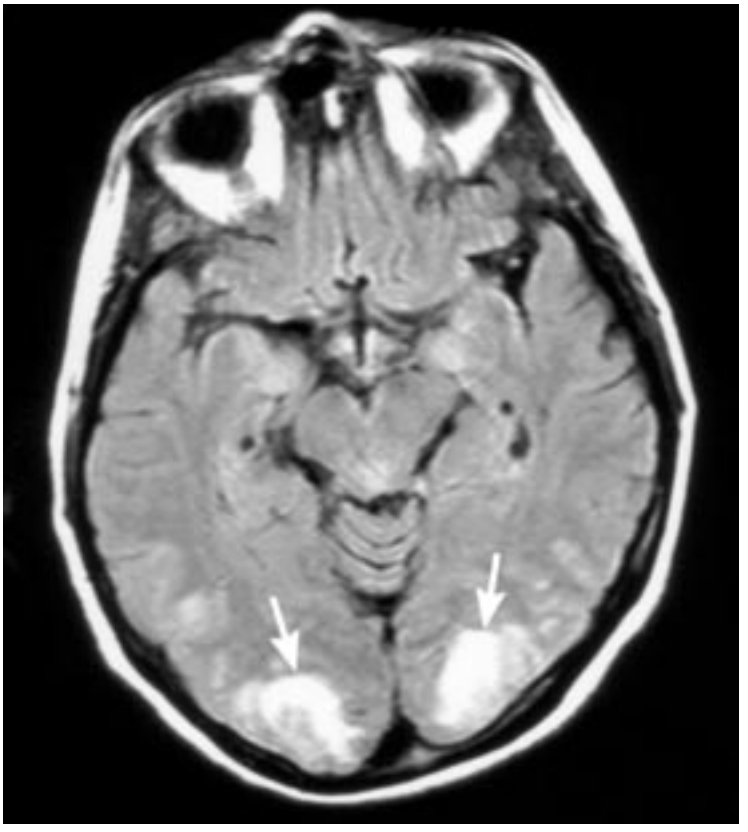

FIGURE 1. Initial magnetic resonance imaging shows patchy symmetrical areas of subcortical edema (arrows) in the posterior parietal and occipital lobes.

Which is the most likely diagnosis?

- ❑ Metastasis from lung cancer
- ❑ Central nervous system lymphoma
- ❑ Bilateral occipital cerebrovascular infarction
- ❑ Posterior reversible encephalopathy syndrome
- ❑ Viral encephalitis

The diagnosis was posterior reversible encephalopathy syndrome, also referred to as hypertensive encephalopathy, reversible posterior cerebral edema syndrome, and posterior reversible leukoencephalopathy. The term hypertensive encephalopathy is misleading, however, since posterior reversible encephalopathy syndrome can occur in patients with normal blood pressure.

CLUES TO THE DIAGNOSIS

Patients present with headache, visual changes, altered mental status (ranging from somnolence to coma in extreme cases), focal neurologic signs, and seizures. MRI or computed tomography of the brain in the presence of consistent clinical symptoms establishes the diagnosis. MRI typically shows symmetrically distributed areas of vasogenic edema, predominantly within the territories of the posterior circulation. The anterior circulation is involved to some degree in almost 90% of

cases. The abnormalities affect primarily the white matter, but the cortex can also be involved. Involvement of the cerebellum and brainstem are common. Localized mass effect and subtle enhancement within the lesions have been described.

Posterior reversible encephalopathy syndrome has been associated with a multitude of etiologic factors. It occurs in patients with hypertensive encephalopathy and eclampsia. It is a known complication of immunosuppressive therapy (eg, with cyclosporin and tacrolimus) and chemotherapy (eg, cisplatin, intrathecal methotrexate, and multi-agent treatment of acute lymphoblastic leukemia). Symptoms can arise after several months of exposure to therapeutic drug levels. This syndrome is also reported in uremia, hemolytic uremic syndrome/thrombotic thrombocytopenic purpura, acute intermittent porphyria, cryoglobulinemia, human immunodeficiency virus infection, metabolic abnormalities, and hydrogen peroxide intoxication.

The common pathogenetic mechanism seems related either to passive overdistention of the vessels due to an increase in the blood pressure, or to a direct toxic effect on the endothelium. A breakdown in cerebral autoregulation results in the leakage of fluid into the interstitium and vasogenic edema. The predilection for involvement of the posterior circulation territories results from the sparse sympathetic innervation of the vertebrobasilar circulation.

TREATMENT

Treatment should be directed at stopping the precipitating factors when possible. Antihypertensive therapy should be used in patients with elevated blood pressure. In most cases, the condition is reversible with appropriate therapy. Occasionally, it can progress to irreversible cytotoxic edema, ischemia, and even death.

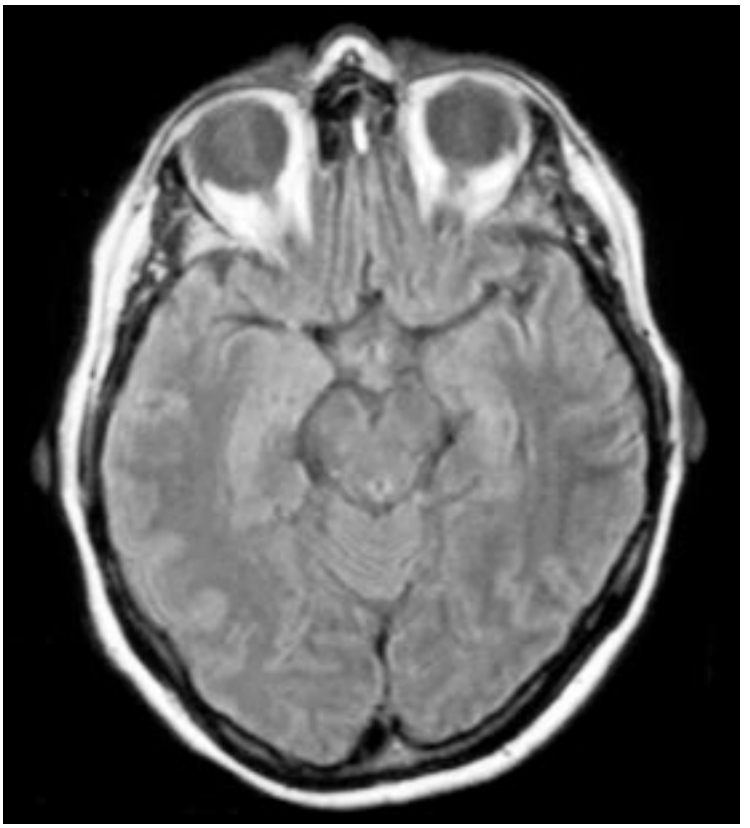

FIGURE 2. Magnetic resonance imaging 2 months later shows complete resolution of the abnormalities.

In our patient, the cause remained unclear. Chemotherapy and hypertension might have played a role. Initial MRI showed patchy symmetrical areas of subcortical edema in the posterior parietal and occipital lobes (FIGURE 1), with subcortical enhancement following contrast administration suggesting disruption of the blood-brain barrier. Her symptoms resolved with antihypertensive treatment. MRI of the brain 2 months later showed complete resolution of previous abnormalities (FIGURE 2).

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