

Diagnostic Imaging Review

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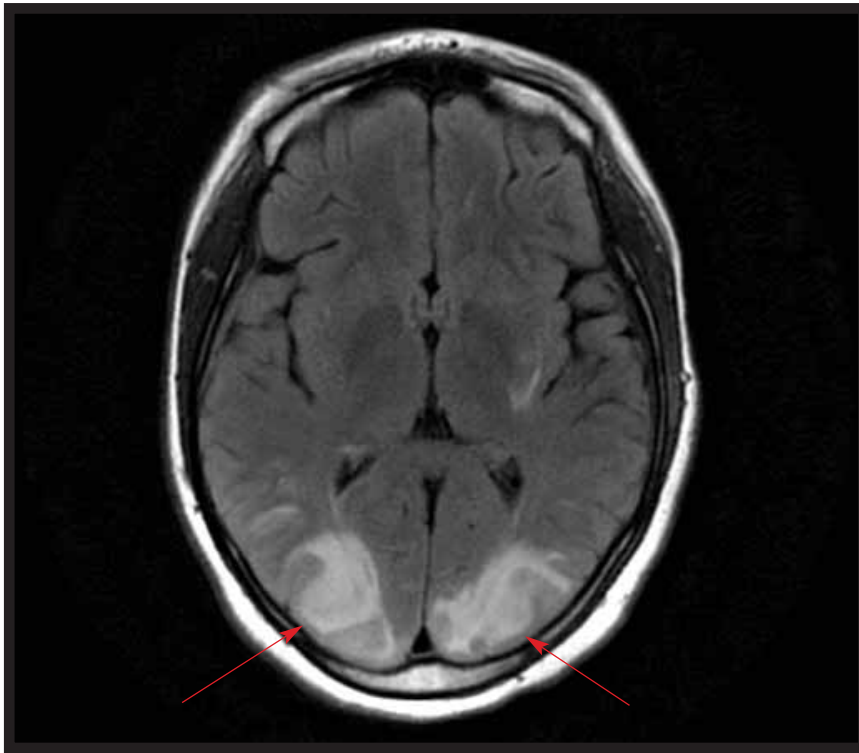


FIGURE 1. Hyperintense signal within the white matter tracts of the parieto-occipital lobes posteriorly and bilaterally (arrows) is seen on fluid-attenuated, inversion recovery T2-weighted MRI.

Eclampsia causes a reversible condition in a young woman

›CASE

A 19-year-old woman presented to the emergency department with a history of seizures at home. She also had a seizure in the ambulance on the way to the hospital. At the time of presentation, she had an elevated BP and was noted to be about 34 weeks' pregnant without history of prenatal care.

Eclampsia was diagnosed and the patient was admitted for immediate

cesarean section. The following day, the patient complained of a mild headache and blurred vision in the left eye. She was seen by the neurology service and an MRI of the brain was ordered (see Figure 1 and Figure 2). What do these images show?

›DISCUSSION

Figure 1 is a fluid-attenuated, inversion recovery T2-weighted MRI of the brain

that shows a hyperintense signal within the white matter tracts of the parieto-occipital lobes posteriorly and bilaterally. Figure 2 is a diffusion-weighted MRI image that demonstrates a small area of increased signal intensity in the right occipital lobe. This is compatible with an early infarct. The findings in Figure 1 are consistent with posterior reversible encephalopathy syndrome (PRES). Figure 2 reveals a small infarct in the right occipital lobe.

PRES, also known as *reversible posterior leukoencephalopathy syndrome*, is a condition that can be caused by several etiologies, but imaging findings are usually characteristic. Patients often present with headaches, hypertension, seizures, visual disturbances, and altered mental status. Other symptoms can include vomiting, impaired memory, lethargy, or agitation. Common precipitants include acutely elevated blood pressure, renal decompensation, fluid retention, preeclampsia or eclampsia, and treatment with immunosuppressive or antirejection drugs. Other associated clinical entities include systemic lupus erythematosus, thrombotic thrombocytopenia purpura, and hemolytic-uremic syndrome. The antirejection and chemotherapeutic agents frequently associated with PRES include cyclosporine, tacrolimus, cisplatin, interferon alpha, and intrathecal methotrexate.¹ Epoetin has also been associated with PRES. The pathophysiology of PRES appears to be related to disorders of cerebral autoregulation and endothelial dysfunction, with two proposed mechanisms. One suggests there is cerebral vasospasm resulting in ischemia and cytotoxic edema. The other suggests vasodilatation is the causative factor resulting in vasogenic edema.² The posterior aspect of the brain is considered to be at greatest risk of insult, as there is less sympathetic innervation, making this area less able to adjust for changes in BP.³

MRI findings suggestive of PRES include white matter edema predomi-

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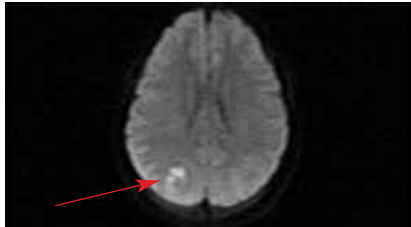


FIGURE 2. A small area of increased signal intensity in the right occipital lobe is compatible with an early infarct.

nantly in the occipital and parietal lobes. This finding is fairly symmetric. PRES does not affect the calcarine and paramedian aspects of the occipital lobe; this characteristic distinguishes PRES from an infarct in the posterior cerebral artery (PCA) territory.⁴ Other areas of the brain, however, may be affected, including the brain stem, cerebellum, basal ganglia, and frontal lobes. CT findings appear as bilateral, fairly symmetric, low-attenuation areas in the posterior

parietal and occipital lobes. The differential diagnosis includes PCA territory infarct, demyelinating disease, venous thrombus, vasculitis, or encephalitis.⁵

Prompt diagnosis of PRES is very important because, as the name implies, it can be reversible. Treatment includes stabilizing the BP, discontinuing or lowering the dose of causative drugs, and treating the seizures. With treatment, most patients have complete neurologic recovery within 2 weeks and imaging findings similarly resolve.⁶ If the syndrome is not treated, the condition can progress to ischemia, infarction, epilepsy, and even death. Pregnant patients must be counseled about the signs and symptoms of preeclampsia, eclampsia, and late postpartum encephalopathy. **JAAPA**

DRUGS MENTIONED

Cisplatin (Platinol-AQ)
Cyclosporine (Gengraf, Neorel, Sandimmune)
Epoetin (Erythropoietin Human Glycoform alpha)

Interferon alfa (Intron A [alfa-2b], Roferon-A [alfa-2a])
Methotrexate (Rheumatrex, Trexall)
Tacrolimus (Prograf)

REFERENCES

1. Covarrubias DJ, Luetmer PH, Campeau NG. Posterior reversible encephalopathy syndrome: prognostic utility of quantitative diffusion-weighted MR images. *AJNR Am J Neuroradiol.* 2002;(23):1038-1048. <http://www.ajnr.org/cgi/content/full/23/6/1038>. Accessed February 2, 2009.
2. Lee HJ. Posterior reversible encephalopathy syndrome. *Appl Radiol.* 2007;36(5):42-43. Medscape Today Web Site. <http://medscape.com/viewarticle/559553>. Accessed February 2, 2009.
3. Nuwer JM, Eshaghian S. Late postpartum eclampsia with posterior reversible encephalopathy syndrome. *Hosp Physician.* 2007;43(6):45-49. http://www.turner-white.com/memberfile.php?PubCode=hp_jun07_late.pdf. Accessed February 2, 2009.
4. Hinchey J, Chaves C, Appignani B, et al. A reversible posterior leukoencephalopathy syndrome. *N Engl J Med.* 1996; 334(8):494-500. <http://content.nejm.org/cgi/content/full/334/8/494>. Accessed February 2, 2009.
5. Das CJ, Seith A. Posterior reversible encephalopathy syndrome (PRES). [Letters to the Editor]. *Indian Pediatr.* 2006; 43(7):657-658. <http://indianpediatrics.net/july2006/july-657-658.htm>. Accessed February 2, 2009.
6. Herrington T, Lieberman G. Posterior reversible encephalopathy syndrome. [Slide presentation]. 2008. <http://radnet.bidmc.harvard.edu/education/medicalStudents/learningLab/central/Herrington.pps>. Accessed February 2, 2009.