

Chemotherapy Associated Neurotoxicity

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01/15/2013

History

Teenage female with ALL and seizure.

Diagnosis

Chemotherapy Associated Neurotoxicity

Additional Clinical

Recent asparaginase and methotrexate therapy.

Discussion

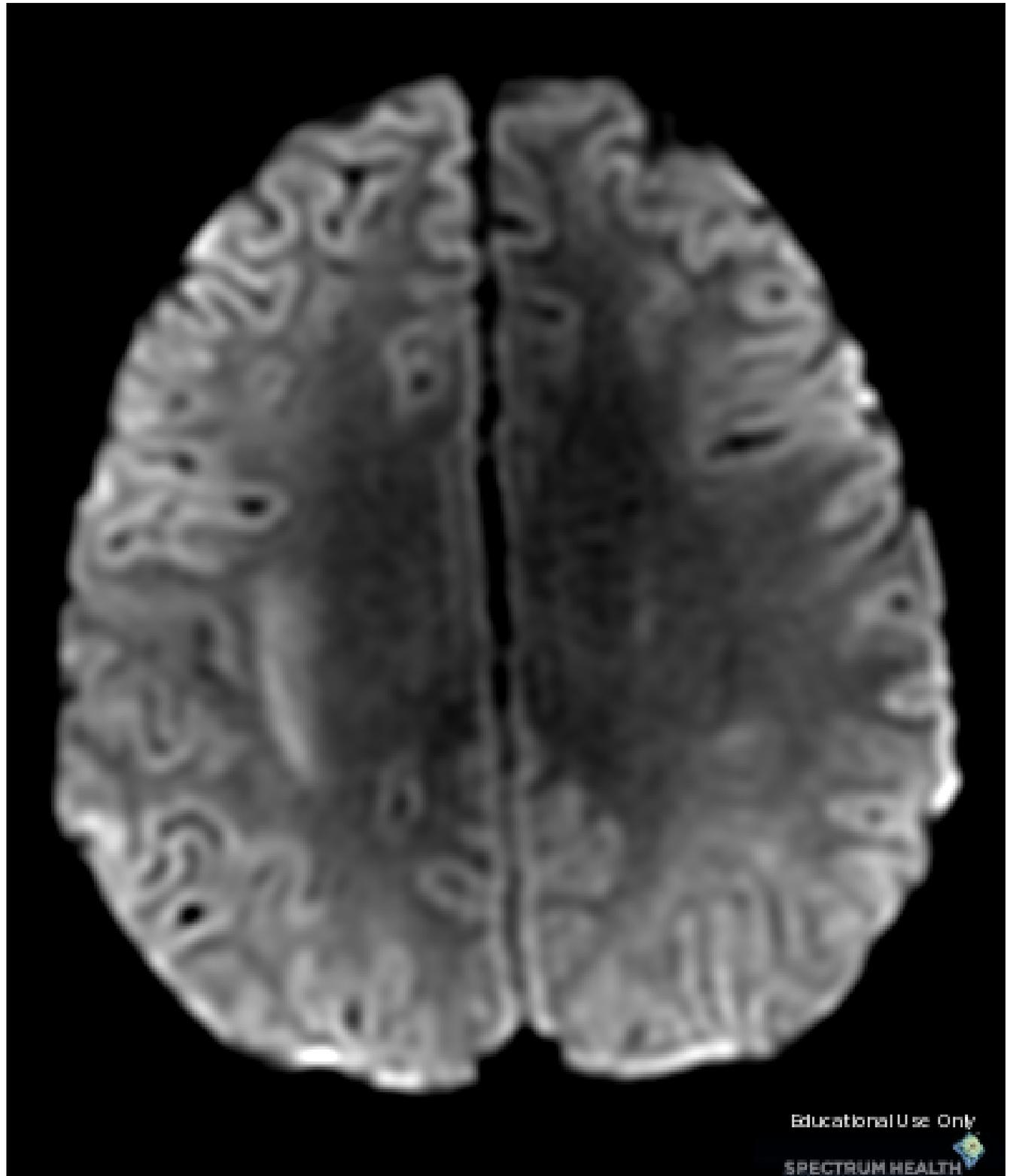
Seizure, transient ischemic attacks, encephalopathy, ataxia and/or myelopathy occur in 5-18% of patients being treated for acute lymphoblastic leukemia. Acute neurotoxicity is probably related to methotrexate, cytarabine, vincristine, asparaginase and/or steroids. Methotrexate is most often implicated and associated with high dose therapy, intrathecal administration, young age and irradiation. The centrum semiovale is most often affected. Pathophysiology is unclear but may be related to adenosine accumulation, homocysteine excitation of n-methyl-d-aspartate receptors and/or altered biopterin metabolism. Diffusion abnormalities precede T2 and T2-FLAIR signal disturbances. Despite restriction, recovery usually occurs, suggesting transient impairment of cell membrane handling of water.

Findings

MR-Isotropic diffusion and apparent diffusion coefficient images show right greater than left frontal and parietal restricted diffusion.

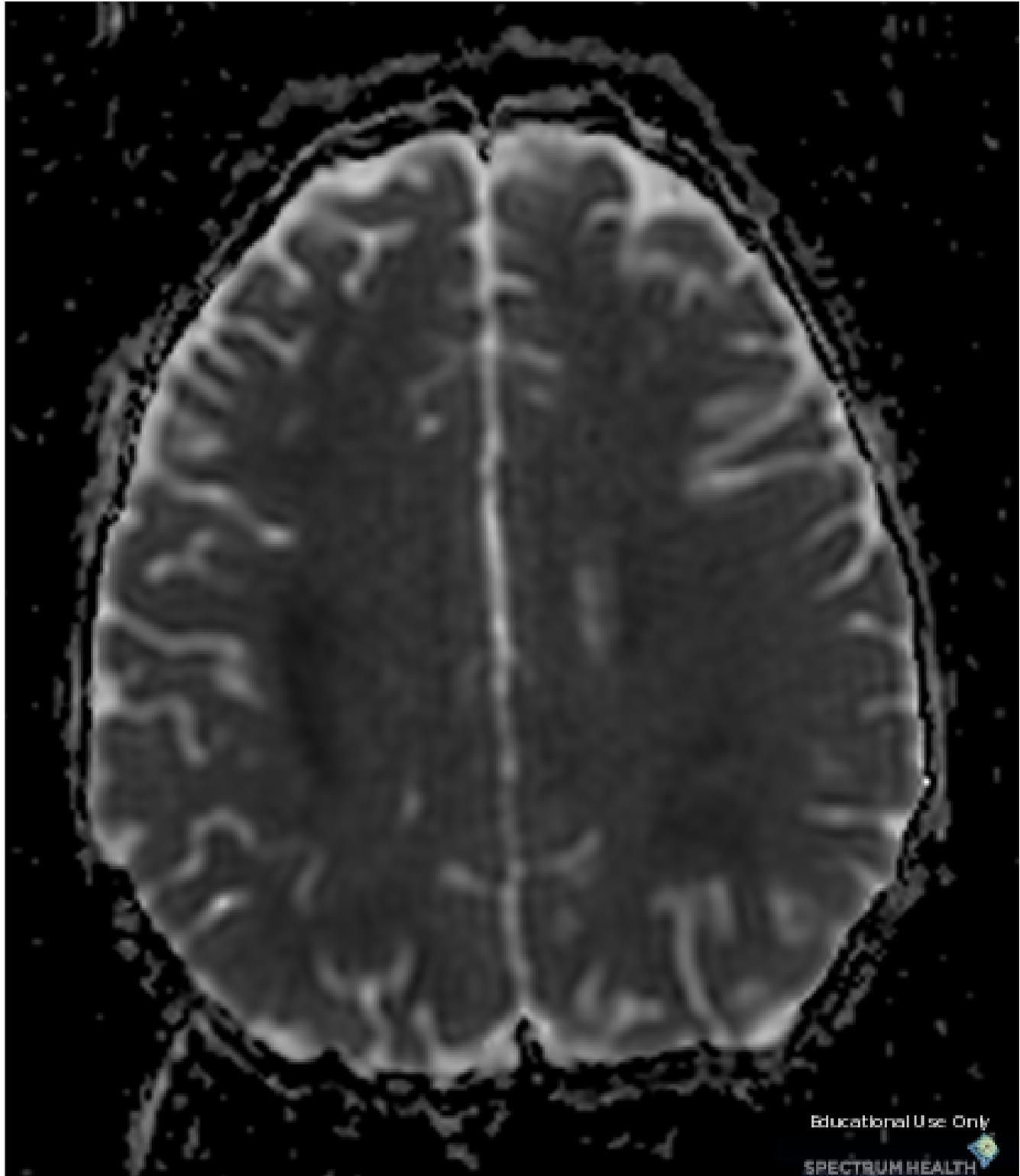
Reference

Fisher MJ, Khademian ZP, Simon EM, et al. Diffusion weighted MR imaging of early methotrexate-related neurotoxicity in children. *Am J Neuroradiol* (2005); 26:1686-1689.



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