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AJNR

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AJNR Am J Neuroradiol 2022, 43 (11) 1685

doi: <https://doi.org/10.3174/ajnr.P6845>

<http://www.ajnr.org/content/43/11/1685.citation>

This information is current as
of May 15, 2025.

Celebrating 35 Years of the AJNR

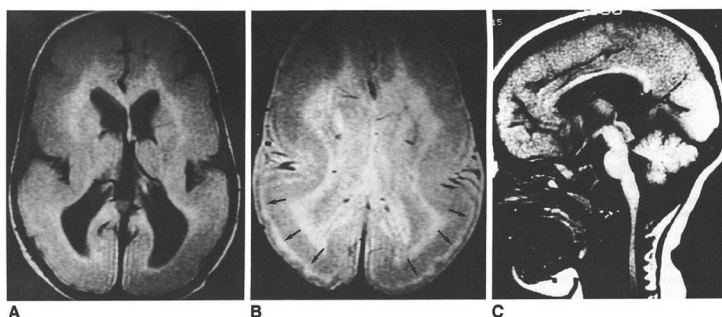
November 1987 edition

MR of Neuronal Migration Anomalies

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Migration anomalies are congenital malformations of neuroblasts during the third to fifth gestational months. They include pachygyria, polymicrogyria, unilateral megalencephaly, heterotopias. Patients who have these conditions present with delay and seizures, and abnormal motor skills are noted in infants. To determine the utility of MR as a method to detect these anomalies, we evaluated 13 patients who had the full spectrum of migration anomalies. We found that MR was more sensitive than CT in detecting these anomalies. We found that MR was more sensitive than CT in detecting these anomalies. We found that MR was more sensitive than CT in detecting these anomalies.

Anomalies of cell migration are characterized by abnormalities of the cerebral cortex. This broad group of anomalies includes pachygyria, polymicrogyria, unilateral megalencephaly, heterotopias. All these entities have been characterized by CT. MR is an imaging technique that can detect these anomalies because of its exceptional differentiation of gray and white matter. In a review of 537 MR studies in the pediatric population with migration anomalies, we review the clinical and their MR appearance. The relationship of these anomalies to theories of pathogenesis is emphasized.



This article appears in the November/December 1987 issue of AJNR and the January 1988 issue of AJNR.

Received March 13, 1987; accepted June 1, 1987.

The views expressed in this article are those of the authors and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

Presented in part at the annual meeting of the American Society of Neuroradiology, New York, May 1987.

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AJNR 6:1009-1017, November/December 1987
0195-6108/87/0609-1009
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Variable Appearances of Subacute Intracranial Hematomas on High-Field Spin-Echo MR

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Subacute intracranial hematomas have variable appearances on MR. They are hyperintense on T1-weighted images owing to methemoglobin. On T2-weighted images, observation of the different methemoglobin states may be possible. In intracranial methemoglobin is hyperintense on T1-weighted images and hypointense on T2-weighted images, undiluted free methemoglobin is hyperintense on T1-weighted images and isointense or slightly hypointense on T2-weighted images. However, it appears that certain regions of subacute hematoma may be differentiated, by intensity patterns alone, from melanotic melanoma. We believe that, despite some limitations, MR is useful in dividing subacute hematomas into their respective methemoglobin states, and also in suggesting a differential diagnosis.

Early experience with MR imaging of intracranial hematomas revealed three characteristic signal-intensity patterns [1]:

1. Acute hematomas (<1 week old) are isointense to gray matter on T1-weighted images and markedly hypointense on T2-weighted images. The selective T2 proton relaxation enhancement (relaxation time of cellular deoxyhemoglobin).

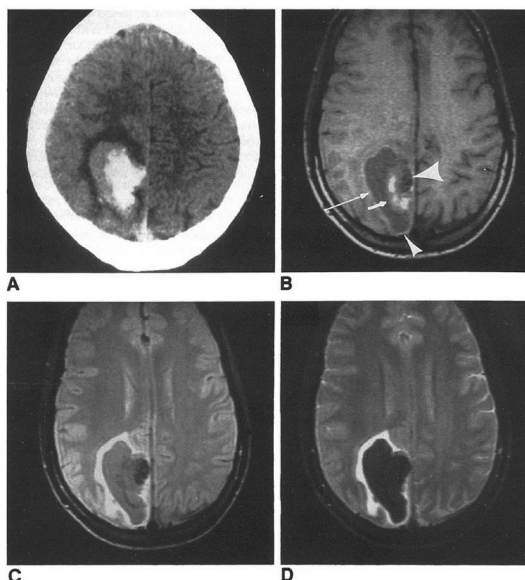
2. Subacute hematomas (about 1 week to <1 month old) are isointense to gray matter on T1-weighted images. The hypointense images proceed to fill the whole hematoma and even become observable on T2-weighted images as well. This is formation of intracellular methemoglobin, which is paramagnetic, cell lysis and watery dilution by resorption of the resultant free iron.

3. In subacute and chronic hematomas, the adjacent brain parenchyma is hypointense on T1-weighted images and markedly hypointense on T2-weighted images. This is because hemosiderin deposits produce a selective enhancement.

We report our observations on the previously unappreciated high-field MR intensities of subacute hematomas and discuss relaxation mechanisms and relevant differential diagnoses.

Subjects and Methods

Over a period of 1 year, we observed five patients with subacute intracranial hematomas. All hematomas were diagnosed and staged by CT. Two were confirmed surgically and pathologically. MR imaging was performed on a 1.5-T superconducting unit. Spin-echo pulse sequences were obtained with two excitations, and 256 × 128 acquisition matrices. T1-weighted images



This article appears in the November/December 1987 issue of AJNR and the January 1988 issue of AJNR.

Received October 27, 1986; accepted after revision May 21, 1987.

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AJNR 6:1018-1026, November/December 1987
0195-6108/87/0609-1018
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