

Atlas of MRI in Epilepsy



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Atlas of MRI in Epilepsy

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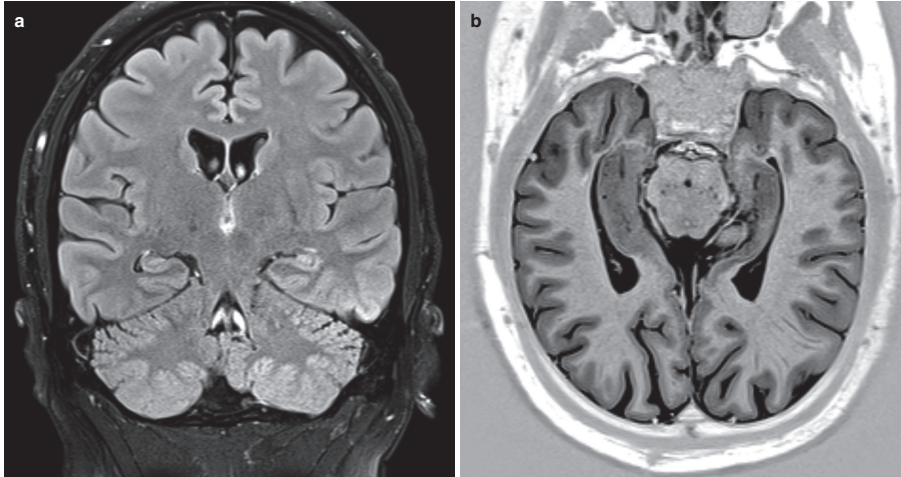
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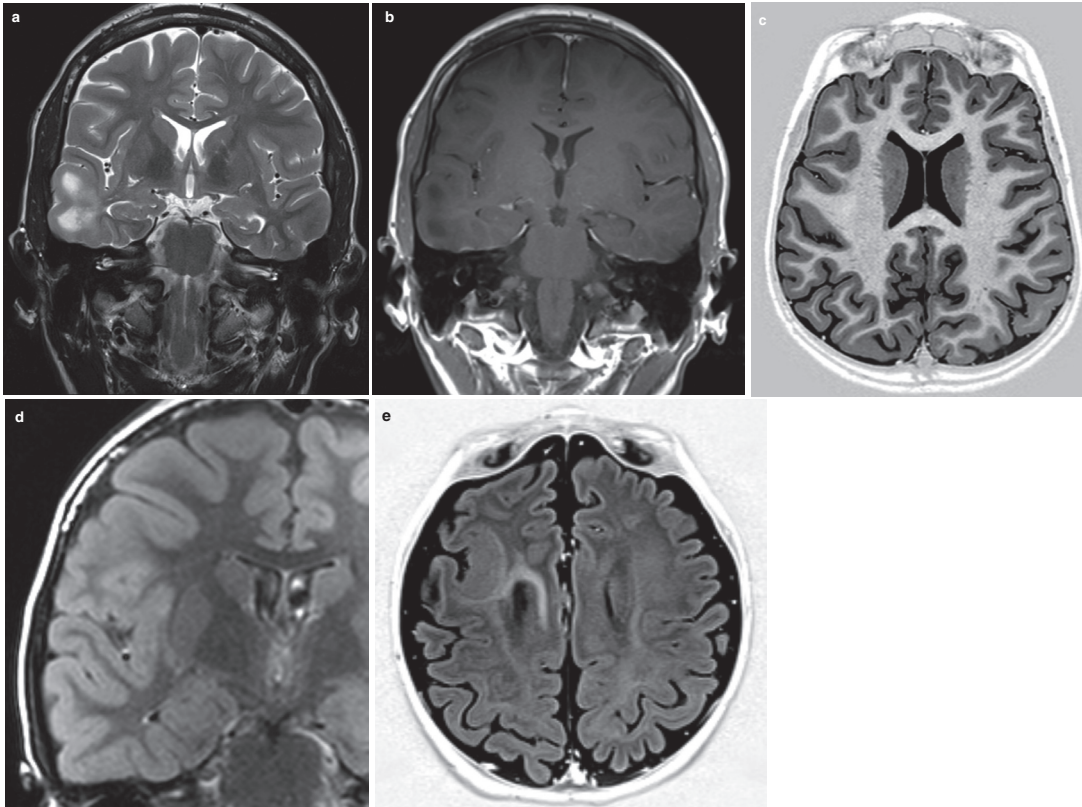


Mesial temporal sclerosis



(a) Coronal T2/FLAIR shows increased signal in the left hippocampus; (b) Axial T1 IR demonstrates volume loss in the left hippocampus. The findings shown are relatively subtle. MRI fails to recognize pathologically detected mesial temporal lobe sclerosis in up to 20% of the cases.

Three cases of focal cortical dysplasia type II

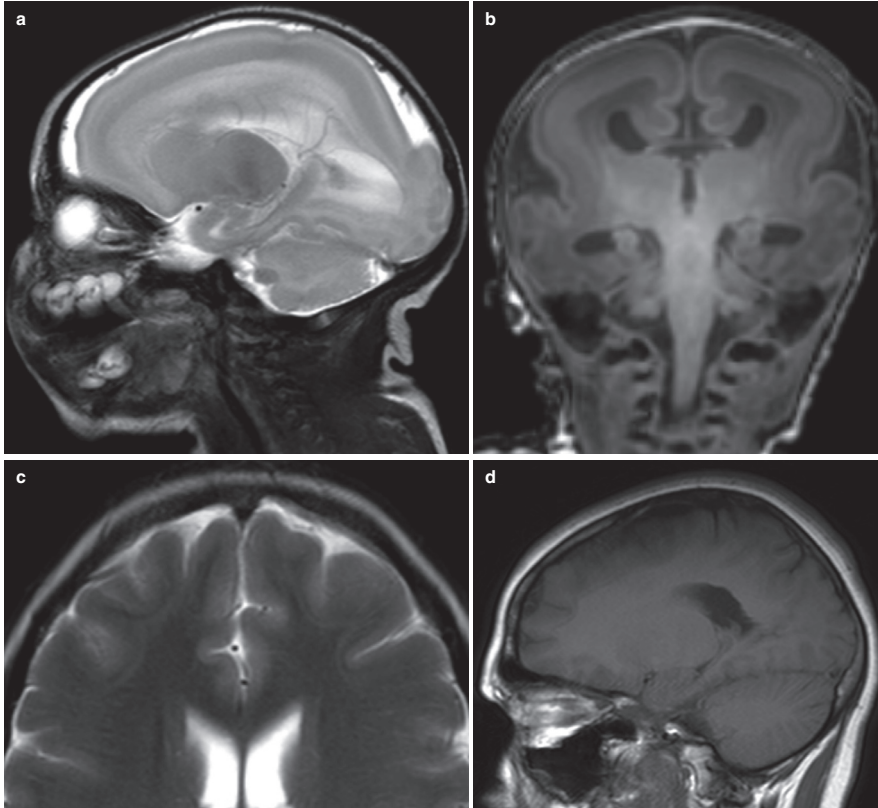


(**a, b**) Patient 1; (**a**) Coronal T2 with large subcortical area in the right temporal lobe with prolonged T2. The increased signal stretches into the temporal horn of the right ventricle; (**b**) Coronal T1 with gadolinium. The corresponding area has decreased signal on T1-weighted image. No enhancement. (**c, d**) Patient 2; (**c**) Axial T1 IR with very subtle signal changes at the bottom of a sulcus lateral in the frontal lobe; (**d**) Coronal T2/FLAIR shows increased signal in the same area with a faint band stretching toward the lateral ventricle. (**e**) Patient 3, boy, 3 months old, axial T1 IR shows a region with thickened cortex in the right frontal lobe. Notice the premature myelination of the white matter tracts involved in the seizures.

Authors: Krings T., Stenberg L
Title: Imaging the Patient with Epilepsy
Book: Diseases of the Brain, Head and Neck, Spine 2016-2019
DOI: 10.1007/978-3-319-30081-8_14
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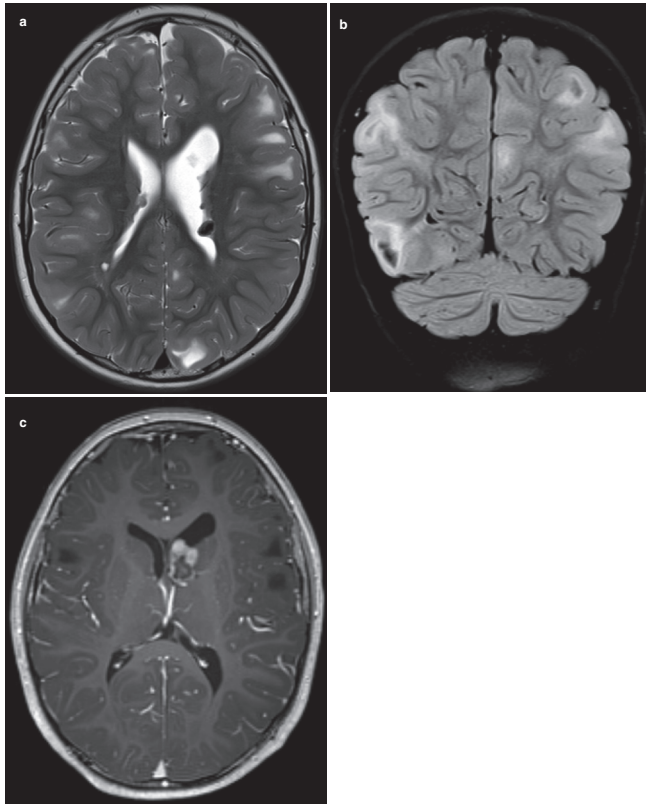
X-linked lissencephaly in a 2-week-old boy



(**a**) Sagittal T2; (**b**) Coronal T1. Lissencephaly with agyria more pronounced in the anterior part of the brain. In addition callosal hypogenesis. (**c, d**) The mother of the boy in (**a**) and (**b**), Female carrier. (**c**) Axial T2 (detail); (**d**) Sagittal T1; Subtle subcortical band heterotopia in both frontal lobes.

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Tuberous sclerosis

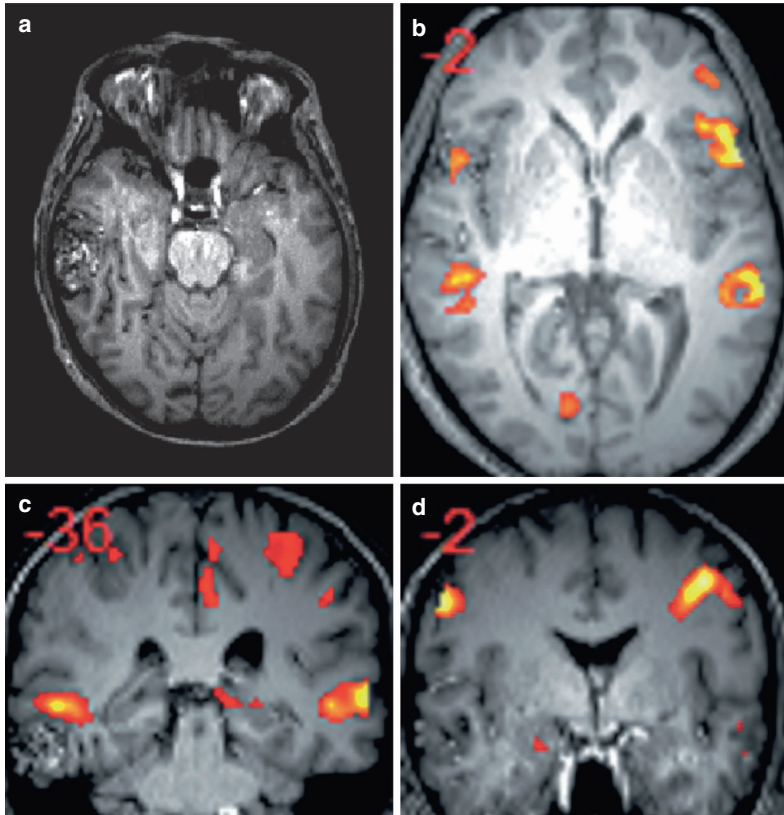


(a) Axial T2 and (b) Coronal T2/FLAIR show subependymal hamartomas and widespread cortical and subcortical signal changes; (c) Axial T1 with gadolinium with a large giant cell astrocytoma in a classical position, close to the foramen of Monro in the left lateral ventricle.

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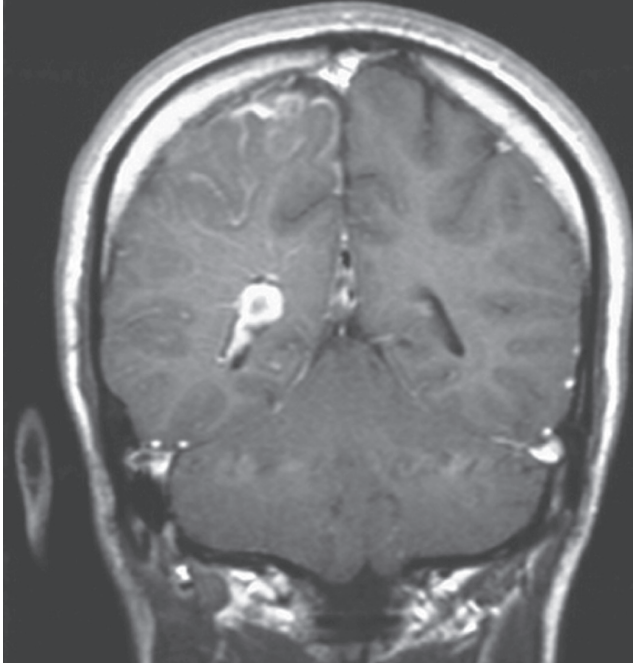
Functional MRI of a 45-year-old left-handed man with a single tonic-clonic seizure



(a) MRI revealed a right temporal lobe arteriovenous malformation (AVM). During the evaluation process for surgical excision of the AVM he underwent fMRI for language localization. This was carried out with three different language paradigms. (b–d) The verb generation paradigm demonstrated bilateral Broca's and Wernicke area activation, with the Wernicke's area just superior to the nidus of the AVM on the right.

Authors: Ziso B., Nicolson A
Title: Resective Surgery for Patients with Epilepsy and Intellectual Disabilities
Book: Epilepsy and Intellectual Disabilities
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Sturge-Weber syndrome

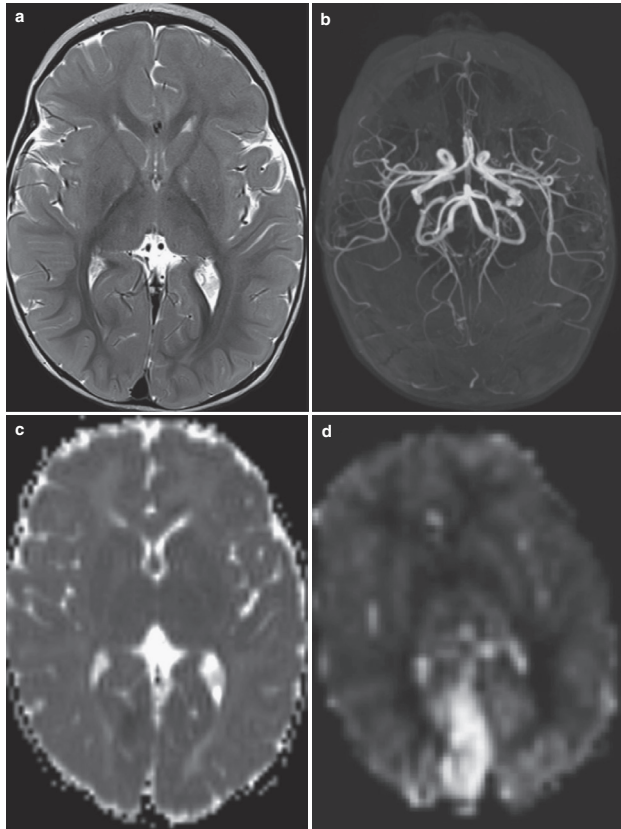


Postcontrast MRI shows the characteristic features of Sturge-Weber syndrome with abnormal enhancement, suggesting calcification in the cortical veins, together with right hemisphere atrophy.

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Title: Resective Surgery for Patients with Epilepsy and Intellectual Disabilities
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DOI: 10.1007/978-3-319-39144-1_9
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An 11-month-old girl presenting with epilepsy partialis continua



(a) Axial T2-weighted imaging was normal apart from subtle loss of gray white distinction in the right parasagittal occipital lobe. (b) Axial MIP from the 3D TOF MRA shows relative prominence of the right PCA compared to the left. (c) Subtle decreased ADC is evident in the right parasagittal occipital lobe. (d) Right parasagittal occipital lobe hyperperfusion is clearly visible on axial PASL. EEG revealed rhythmic high-amplitude delta with superimposed spikes (RHADS), a hallmark of Alpers' syndrome. The imaging findings are consistent with hyperfusion and mild metabolic compromise from ongoing seizure activity. The child was confirmed to have a POLG1 mutation.

Authors: Grant P.E.

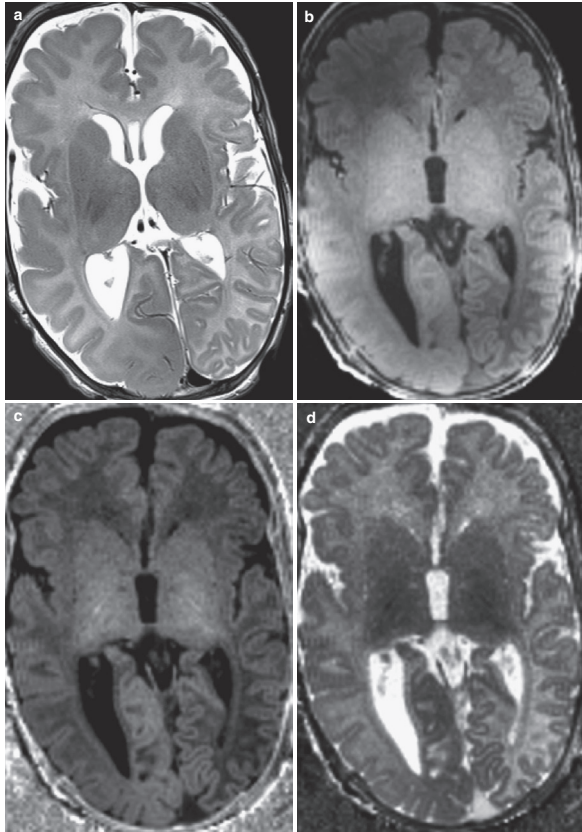
Title: Advanced MR Techniques in Pediatric Neuroradiology: What Is Ready for Clinical Prime Time?

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A 7-week-old infant presenting with fever and concern for sepsis followed by persistent seizure activity



(a) Axial T2 shows an asymmetrically large right hemisphere with an enlarged genu of the corpus callosum. T2 signal throughout the right hemisphere white matter is abnormally low and there is apparent thickening of the cortex diffusely. The left temporal and occipital lobe looks normal but the right frontal lobe is concerning for involvement. (b) Axial reformation of a sagittal MPRAGE has non-uniform signal due to the phased-array coils making further evaluation of the left frontal lobe difficult. (c) Axial reformation of the uniform intensity image created from the MP2RAGE acquisition shows subtle differences in white matter signal in the left frontal and occipital lobe. (d) Axial reformation of the T1 map created from the MP2RAGE acquisition confirms the abnormal T1 values in the left frontal white matter compared to the occipital lobe and more similar to the right frontal lobe. These findings are consistent with right hemimegalencephaly with additional involvement of the left frontal lobe.

Authors: Grant P.E.

Title: Advanced MR Techniques in Pediatric Neuroradiology: What Is Ready for Clinical Prime Time?

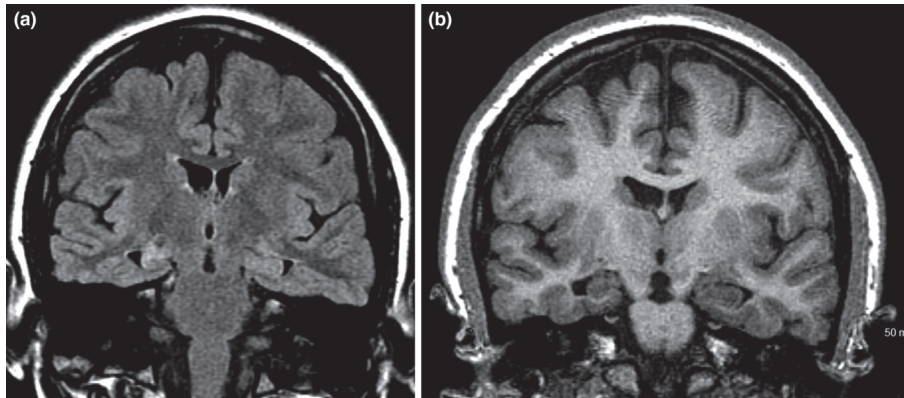
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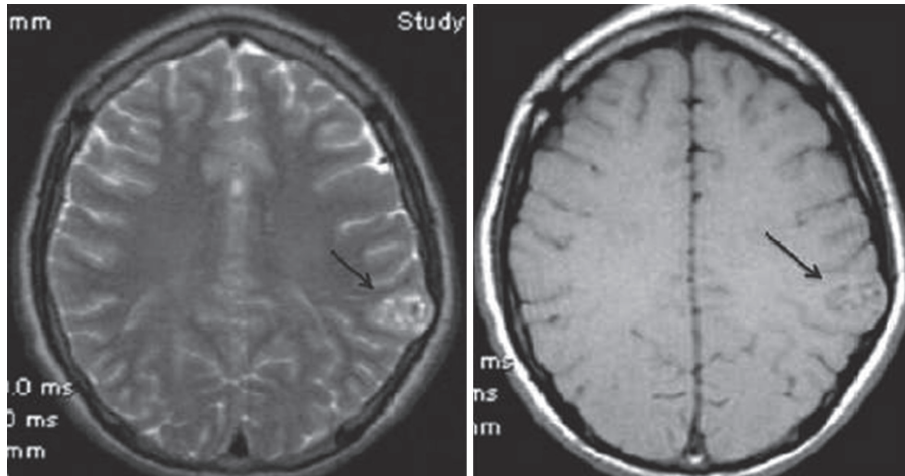
Magnetic resonance imaging scan of an 18-year-old woman with a history of seizures presenting in nonconvulsive status epilepticus



Coronal fluid attenuated inversion recovery (*FLAIR*)-weighted images show high signal intensity in the right hippocampus (**a**). Coronal spoiled gradient echo images show atrophy of the right anterior hippocampus (**b**).

Authors: Edwards J.C., Gomez-Hassan D.M., Bonilha L
Title: Imaging in Status Epilepticus
Book: Status Epilepticus. Current Clinical Neurology
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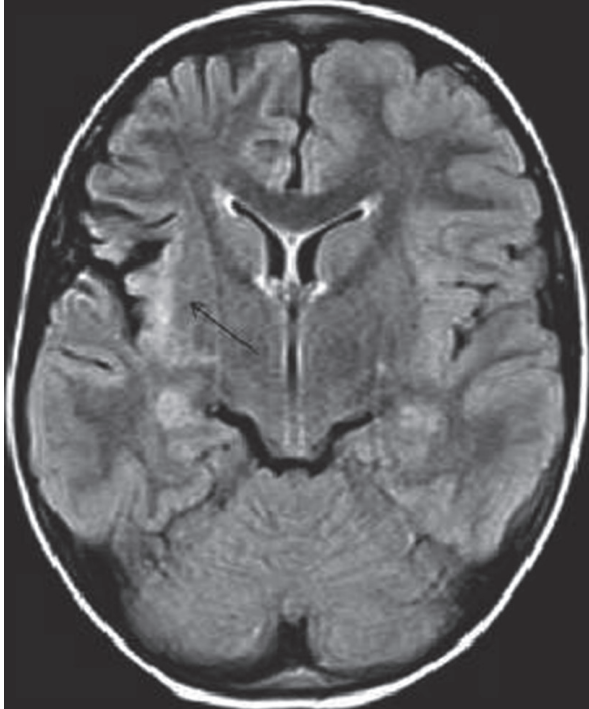
Ganglioglioma in left posterior parietal lobe



T2 (*left*)- and T1 (*right*)-weighted MRI images showing epileptogenic lesion (ganglioglioma) in left posterior parietal lobe as indicated by the *arrows*.

Authors: Batchelder P.L.
Title: Surgical Management of Epilepsy
Book: Nursing Care of the Pediatric Neurosurgery Patient
DOI: 10.1007/978-3-319-49319-0_13
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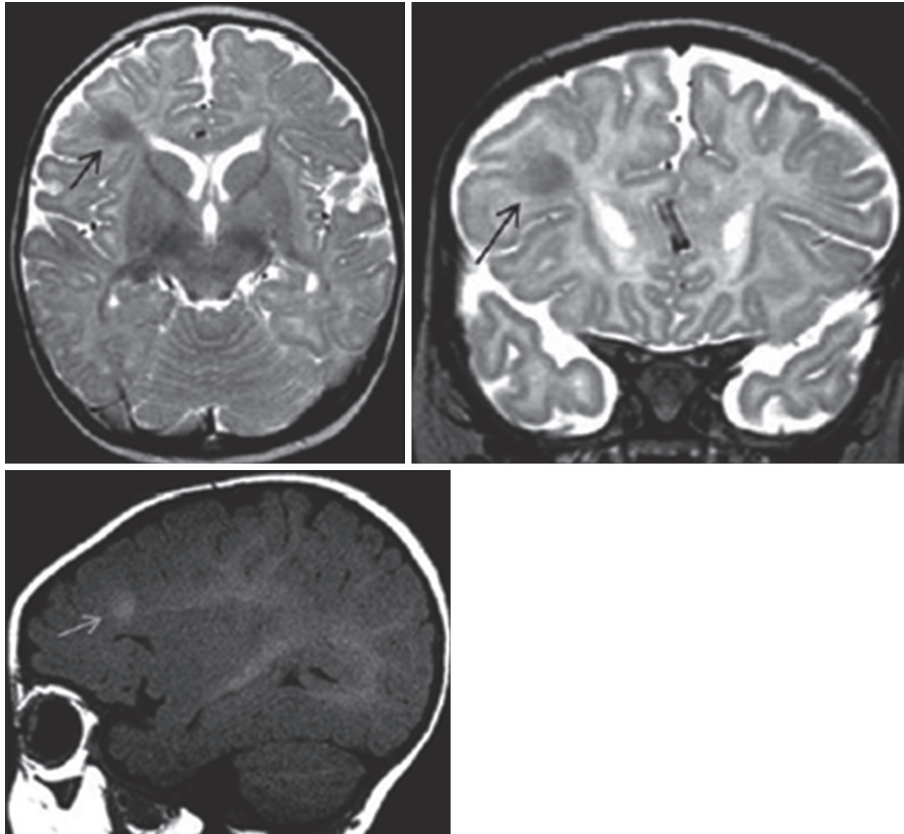
Rasmussen's encephalitis



MRI FLAIR image showing *right-sided* atrophy as evidenced by a widened Sylvian fissure. Also note the increased signal in the area indicating inflammation (indicated by *arrow*).

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Focal cortical dysplasia



Focal cortical dysplasia of the frontal lobe (indicated by *arrow*).

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Book: Nursing Care of the Pediatric Neurosurgery Patient

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