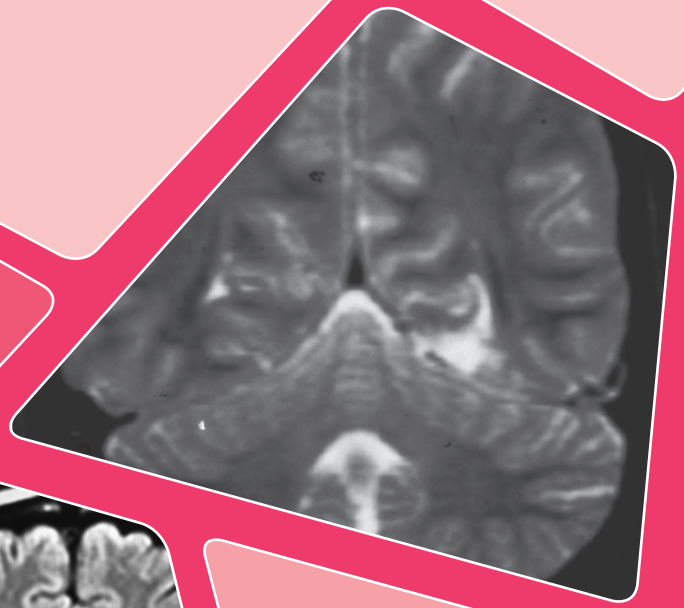
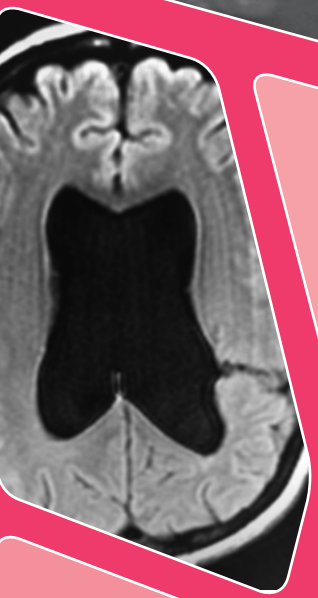
Issue 2





Atlas of MRI in Epilepsy

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Springer Healthcare Education

Atlas of MRI in Epilepsy

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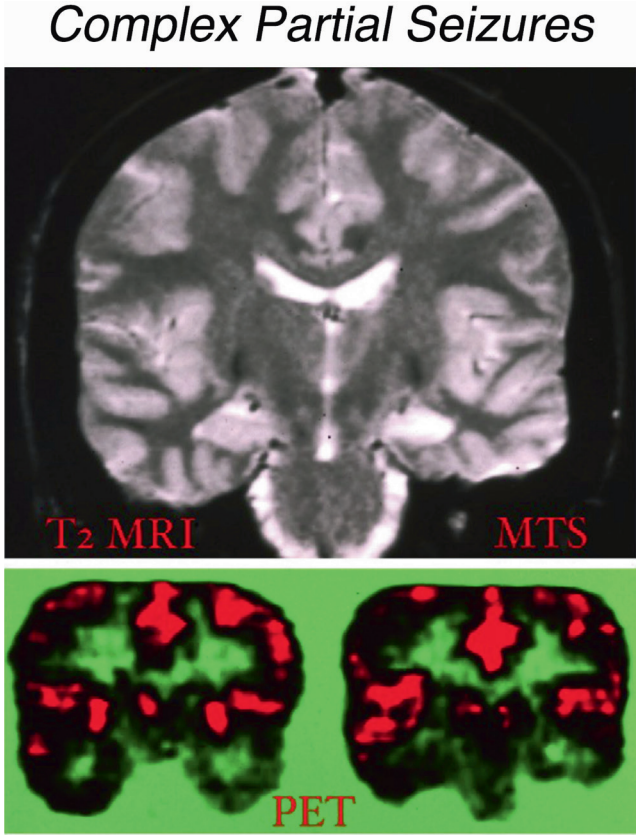
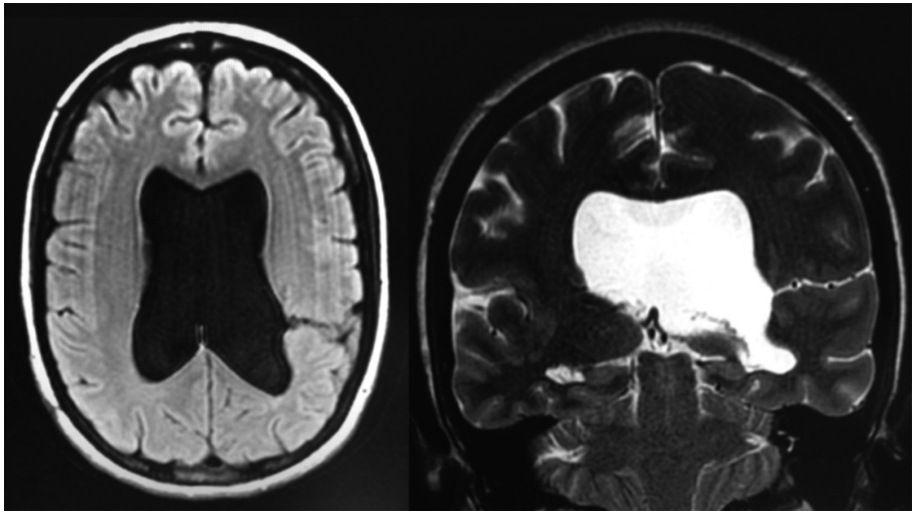
Left mesial temporal sclerosis



Left mesial temporal sclerosis: coronal magnetic resonance (MR) versus positron emission tomography (PET) findings. MR obtained in the coronal plane is the most sensitive way to detect abnormally high T2 signal within the hippocampus of complex-partial seizure patients who harbor a highly focal area of hippocampal scarring, other known as mesial temporal sclerosis (MTS) as shown above in the preoperative evaluation that included ^{18}F-FDG imaging as well to confirm site of suspected inter-ictal metabolic depression (PET confirms inter-ictal left temporal hypometabolism concordant with the left hippocampal area of MTS seen on MRI).

Author: M.A. Meyer
Title: Epilepsy
Book: Neurologic Disease
DOI: 10.1007/978-3-319-39581-4_4

Seizures secondary to parietal schizencephaly



Magnetic resonance imaging (MRI) revealing closed lip schizencephaly. MRI is a very sensitive tool in evaluating seizure patients with closed lip schizencephaly, as shown in the figure. MRI can more accurately diagnose subtle cortical malformations in epilepsy patients that may be missed on axial computerised tomography (CT) brain examinations.

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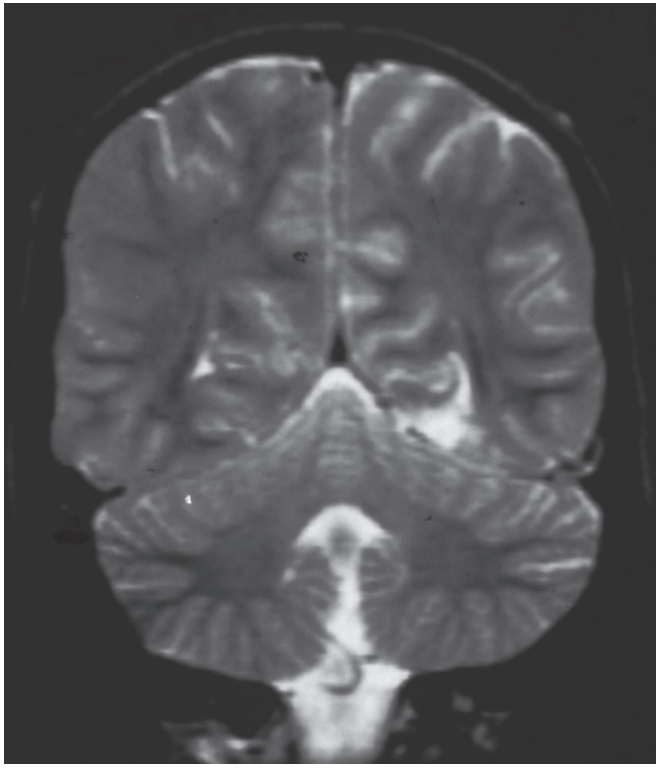
MRI for diagnosing subtle cortical malformations



Magnetic resonance imaging (MRI) can more accurately diagnose subtle cortical malformations in epilepsy patients that may be missed on axial computerised tomography (CT) brain examinations. Focal left occipital-temporal cortical maldevelopment: visual prodrome reported by epilepsy patient in advance of generalized seizure activity corresponding to focal left inferior occipital-temporal cortical lesion seen on coronal T2 MRI.

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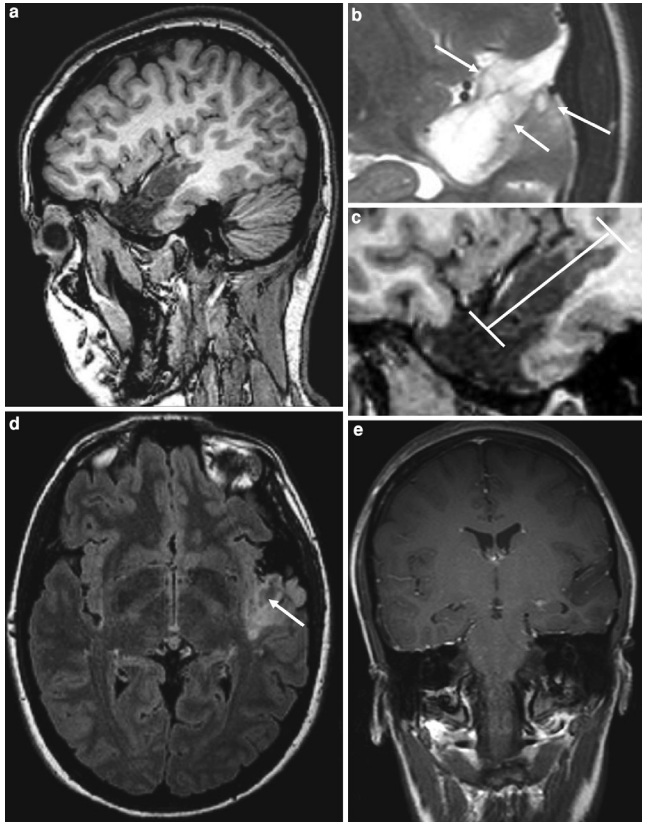
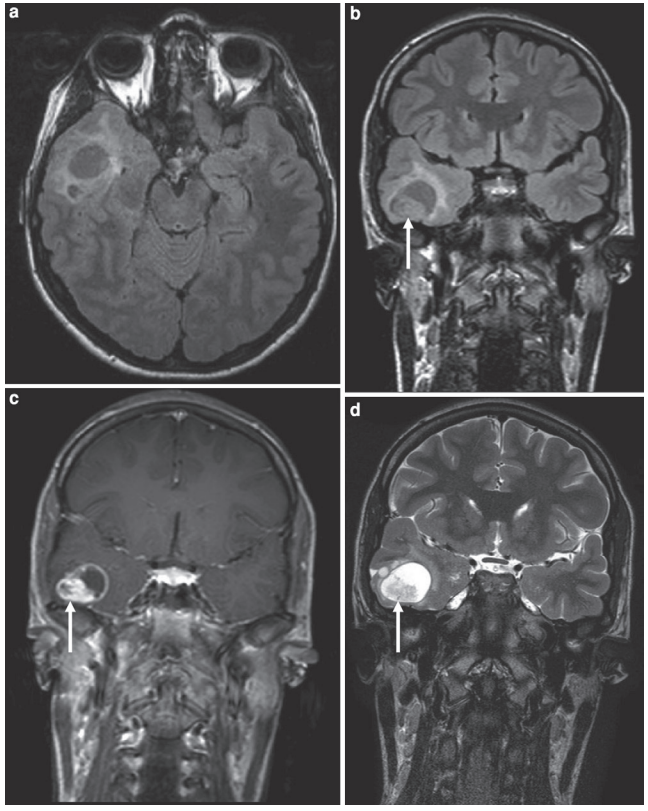
Epilepsy-associated oligodendroglioma



Magnetic resonance imaging (MRI) after surgery of an "oligodendroglioma" in 1991. Posteriorly to the surgical defect, there is a 28 x 12 mm cystic lesion with slightly higher signal intensity than cerebrospinal fluid (CSF) on T1-weighted images (**a, c, e**). Diagnostic hallmark are tiny cysts within the dysembryoplastic neuroepithelial tumour (DNT), which are best appreciated on high resolution T2-weighted images (**b**: *arrows*). Larger cysts are hypointense on FLAIR-images (**d**: *arrow*).

Author: Horst Urbach
Title: Epilepsy associated tumors and tumor-like lesions
Book: MRI in Epilepsy: Medical Radiology: Diagnostic Imaging
DOI: 10.1007/174_2011_525

A 17-year-old woman with a single tonic-clonic seizure



Pilocytic astrocytoma World Health Organization (WHO) grade I: a 17-year-old woman with a single tonic-clonic seizure. MRI shows a three-cm large tumor with a large cyst, a solid, contrast enhancing tumor portion at the border of the cyst (**a–d**: *arrow*) and perifocal edema. The size of the cyst, a single seizure, and perifocal edema go against a ganglioglioma but for a pilocytic astrocytoma. However, the superficial contrast enhancement fits to a pleomorphic xanthoastrocytoma (PXA).

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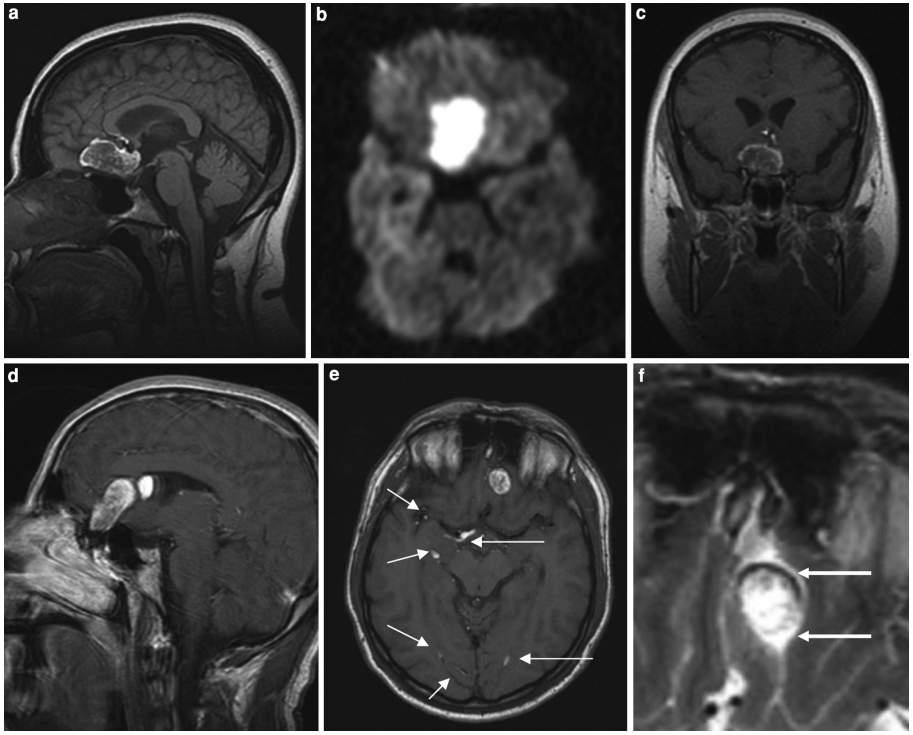
A 30-year-old woman with drug-resistant seizures



A 30-year-old woman (**a–c**) and a 36-year-old man (**d–f**) suffered from drug-resistant seizures difficult to localize. Magnetic resonance imaging (MRI) showed frontobasal "midline" dermoids, which are hyperintense on T1-weighted (**a, c, d, e**), T2-weighted (**f**) and diffusion-weighted images (**b**). Note dermoid droplets in the subarachnoid space (**e**: *arrows*) and chemical shift artefact (**f**). The chemical shift artefact is caused by different resonance frequencies of hydrogen nuclei bound to fat and water molecules. The dermoid contains fat-bound hydrogen nuclei and is displaced in the frequency-encoding direction with a low signal band anteriorly and a high-signal band posteriorly (**f**: *arrows*).

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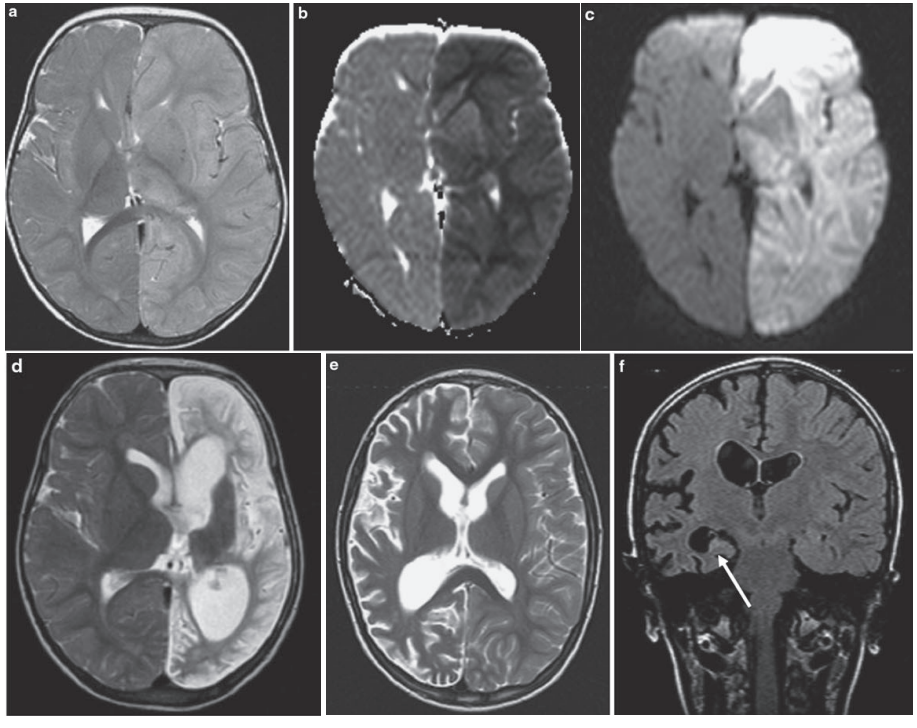
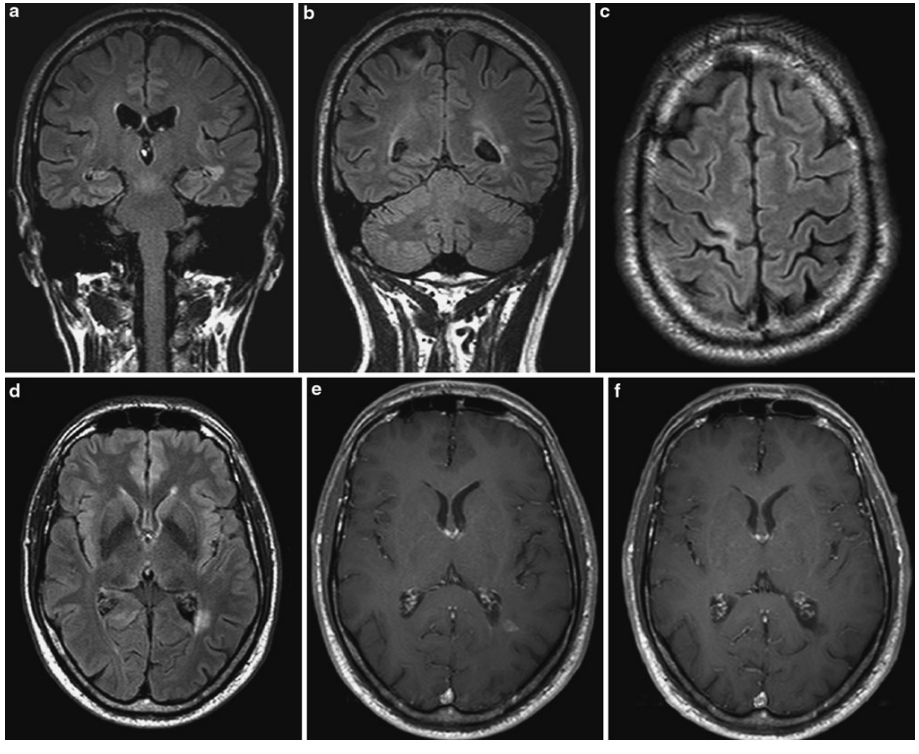
A 13-month-old girl with cytotoxic edema



Magnetic resonance imaging (MRI) of a 13-month-old girl with cytotoxic edema of the left hemisphere (**a–c**) including the thalamus and occipital lobe. No vessel occlusion on TOF-MRA (not shown). **d**. Follow-up MRI after 1 year shows profound left-sided hemiatrophia cerebri et cranii. **e–f**. A 5-year-old boy presented with a prolonged complex febrile seizure with persisting left-sided hemiparesis. MRI after 2 months showed right-sided hemiatrophy and hippocampal sclerosis (**f**: *arrow*).

Author: Horst Urbach
Title: Other epilepsy-associated diseases and differential diagnoses
Book: MRI in Epilepsy: Medical Radiology: Diagnostic Imaging
DOI: 10.1007/174_2012_750

A 51-year-old man with myoclonic seizures



Magnetic resonance imaging (MRI) in a 51-year-old man, who presented with myoclonic seizures of the left leg. MRI showed a right-sided cortical pre- and postcentral lesion (**b, c**: *arrow*) and periventricular lesions (**a, d**: *arrow*). Contrast enhancement of a periventricular lesion at the right trigone disappeared on follow-up MRI after 6 months.

Author: Horst Urbach
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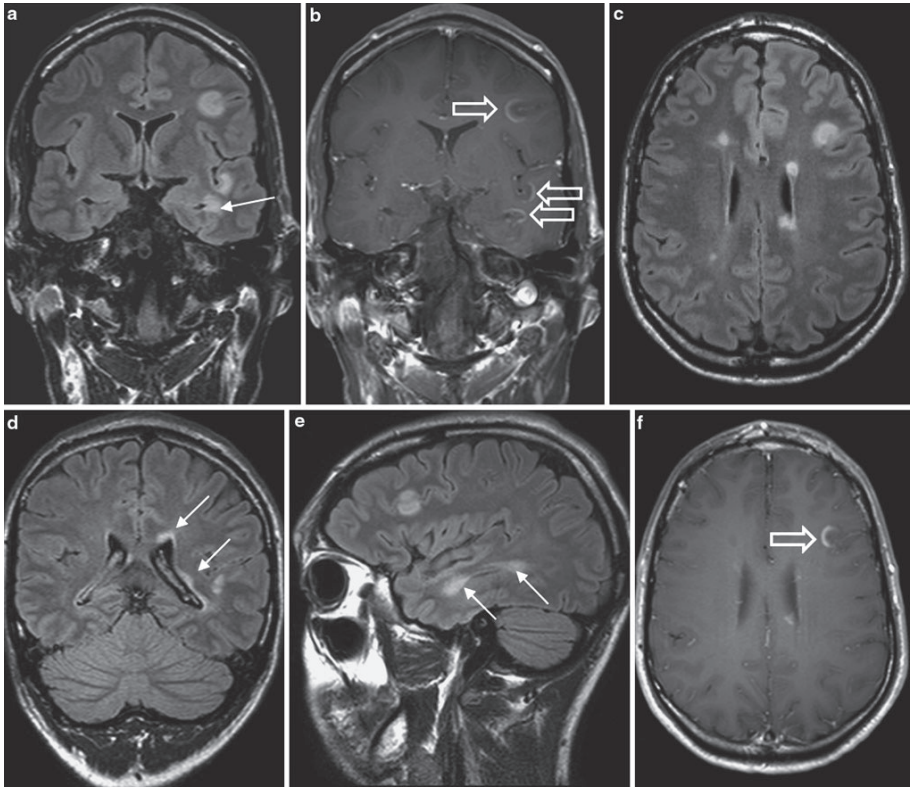
A 31-year-old patient with a generalized tonic-clonic seizure



Magnetic resonance imaging (MRI) in a 31-year-old patient with a generalized tonic–clonic seizure as first manifestation of multiple sclerosis (MS). MRI shows multiple periventricular and juxtacortical demyelinating lesions (**a–e**). Many lesions are contrast-enhancing with some of the larger lesions displaying a so-called open-ring sign (**b, f**: *hollow arrows*). If MS patients present with epileptic seizures, a pattern with (confluent) lesions lining the temporal horns is often found (**a, d, e**: *arrows*).

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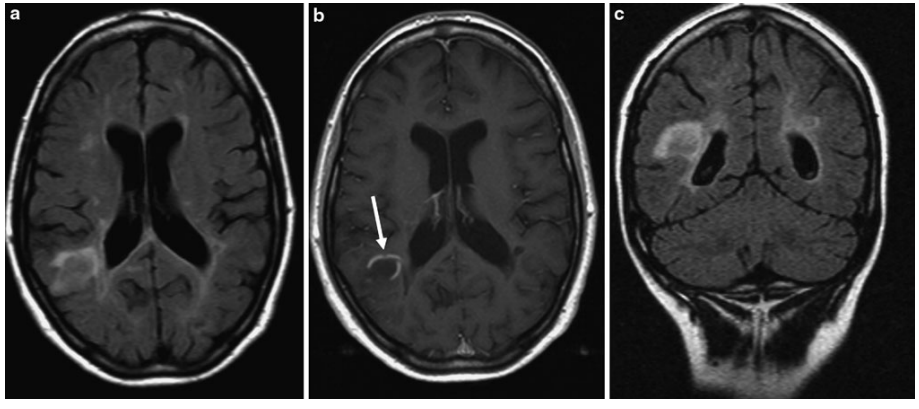
A 49-year-old woman with a generalized tonic-clonic seizure



Magnetic resonance imaging (MRI) in a 49-year-old woman with relapsing–remitting multiple sclerosis and a generalized tonic–clonic seizure. MRI shows multiple periventricular demyelinating lesions (**a, c**) and a large temporo-occipital contrast-enhancing lesion with open-ring sign, which extends from the periventricular region to the U-fibers (**b**: *arrow*).

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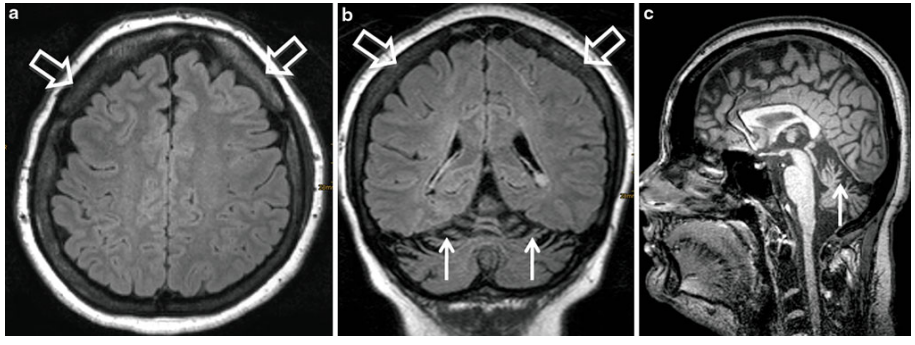
A 38-year-old woman with epileptic seizures



Sequelae of long-lasting phenytoin therapy in a 38-year-old woman who presented with epileptic seizures 22 years ago and was taking phenytoin since this time. Marked cerebellar atrophy (**b, c**: *arrows*) and distinct cranial vault thickening (**a, b**: *hollow arrows*) are distinct imaging features.

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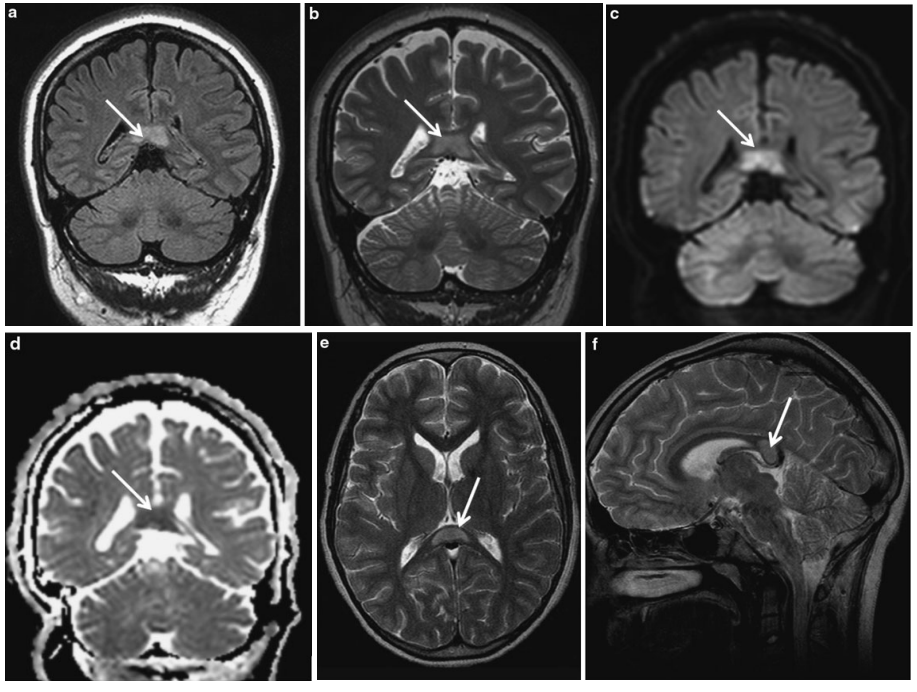
"Reversible" splenium lesions



"Reversible" splenium lesions: non space-occupying cytotoxic edema within the center of the splenium after antiepileptic drug withdrawal for presurgical evaluation (**a–d**: *arrow*) and due to lymphocytic encephalitis (**e, f**: *arrow*), respectively.

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