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Differential Diagnosis for Seizure

Seizure	Goroll & Mulley	Labus and Kowalak	Eisenberg	Kasper	Gomella	Wasson	Total	Collected Cases
Brain tumor	x	x	x	x	x	x	6	4
Drugs (Alcohol withdrawal)	x	x	x	x	x	x	6	
Trauma	x	x	x	x	x	x	6	
Primary epilepsy	x	x	x	x	x	x	6	
Hypoglycemia	x	x	x	x	x		5	
Renal failure		x	x	x	x	x	5	
Encephalitis		x		x	x	x	4	1
Hyperosmolar state	x		x	x	x		4	
Hyponatremia	x	x	x	x			4	
Stroke	x	x	x	x			4	1
Brain abscess		x			x	x	3	1
Febrile convulsions			x		x	x	3	
Eclampsia		x			x		2	
Hepatic failure			x	x			2	
Hypoxia		x			x		2	
Neurofibromatosis		x			x		2	
Meningitis					x	x	2	
Hypertensive encephalopathy					x	x	2	
AVM			x				1	1
Congenital/developmental anomaly			x				1	
Hypoparathyroidism		x					1	
Mesial temporal sclerosis			x				1	
Systemic lupus erythematosus					x		1	
Whipple disease					x		1	
Sickle cell disease					x		1	

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Cause	Clinical Findings	Imaging Findings
Brain and CSF Spaces		
Brain abscess	Fever, N/V, stiff neck, FND, MSC	Rim-enhancing mass with surrounding white matter edema
Brain tumor	N/V, FND, MSC, personality change, difficulty with balance	Rim-enhancing mass with surrounding white matter edema; multiple lesions with metastatic disease
Meningitis	Fever, stiff neck, MSC, photophobia, phonophobia	Thickened and/or enhancing meninges
Arteriovenous malformation	Bruit, FND, MSC	Mass with characteristic "bag of worms" appearance
Encephalitis	MSC, FND	Brain swelling; abnormal signal/density and enhancement
Mesial temporal sclerosis	Seizures	Increase SI on T2WI in the hippocampus; atrophy of the hippocampus
Stroke	FND, MSC, N/V	Abnormal brain density/SI; brain swelling; abnormal enhancement; restricted DWI; associated hemorrhage
Neurofibromatosis	NF1:café au lait spots, peripheral neurofibromas, cognitive disability; CNS symptoms secondary to tumors. NF2: hearing loss	NF1: masses (optic nerves, brainstem, spine, brain), sphenoid wing dysplasia; axillary or inguinal freckles; NF2: bilateral schwannomas, meningiomas, and ependymomas
Hypertensive encephalopathy (PRES)	HA, encephalopathy, visual disturbance; history of severe hypertension (e.g. eclampsia, post-partum), SLE	Vasogenic edema in the parieto-occipital region with associated increased SI on T2WI; normal DWI
Congenital or developmental brain anomaly[1]	Depends on the nature and extent of the specific disease (see footnote).	Depends on the nature and extent of the specific disease (see footnote). Some are quite subtle and are best evaluated with 3T studies interpreted by subspecialists.
Trauma	Injury, MSC, N/V, FND	Brain swelling; abnormal SI and enhancement
NO SPECIFIC IMAGING FEATURES ON CT OR MRI		
Drugs (alcohol withdrawal), hypoglycemia, renal failure, hyperosmolar state, hyponatremia, febrile convulsions, eclampsia (uncomplicated by stroke etc.), hepatic failure, hypoxia, hypoparathyroidism, Whipple disease, sickle cell disease (uncomplicated by stroke etc.), "primary epilepsy" (a term which has been used for epilepsy without specific cause; this term has now fallen out of favor).		

FND = focal neurologic deficit; MSC = mental status changes; Sz = seizures; N/V = nausea/vomiting; SI = signal intensity; CN = cranial nerve; UE = upper extremity; SAH = subarachnoid hemorrhage; IPH =

[1] A term which covers various malformations of cortical development presenting with seizures including tuberous sclerosis, focal cortical dysplasia, hemimegalencephaly, lissencephaly, subcortical band heterotopia, periventricular nodular heterotopia, polymicrogyria, and schizencephaly.

intraparenchymal hemorrhage; NF1 = neurofibromatosis type 1; PRES = posterior reversible encephalopathy syndrome