Approach to Classification of Epilepsy

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Case Vignette-1

- 21 year old man presents with one episode of seizure 3 hours ago- 3 p.m.
- Seizure is suggestive of unknown onset generalized tonic clonic seizures
- He has one more episode of generalized tonic clonic seizures while in hospital at 6 p.m.

Question

- Does this patient have epilepsy

1. Yes
2. No
3. Maybe

Diagnosis of Epilepsy

- A disease of the brain defined by any of the following conditions:

(1) At least two unprovoked (or reflex) seizures occurring >24 h apart

(2) one unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years

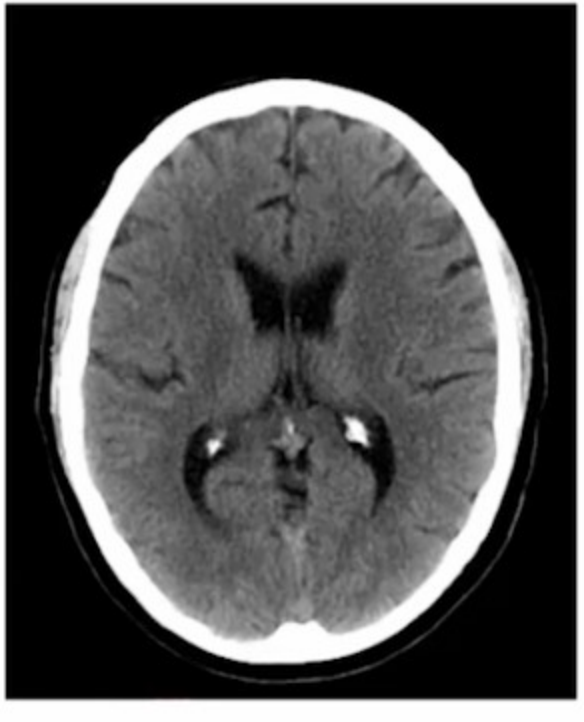
(3) diagnosis of an epilepsy syndrome.

Case Vignette-2

- 65 year old man with Hypertension on diuretics
- Complained of fatigue and drowsiness for 2 days
- Wife woke up in the night and noticed jerking of all 4 limbs
- He had another episode of unknown onset GTCS on the way to hospital

Case Vignette-2

- CT head: normal
- RBS: 112 mg/ dl
- Blood reports-
  - Sodium: 112 meq/ L
  - RFT/ LFT/ CBC: Normal



Question

- What is the diagnosis?

1.Epilepsy

2.Epileptic encephalopathy

3.Acute symptomatic seizures

Acute symptomatic seizure

- Seizures occurring in close temporal association with an acute systemic, metabolic, or toxic encephalopathy or in association with an acute central nervous system disorder

- Common causes-

➢ Infection

➢ Stroke

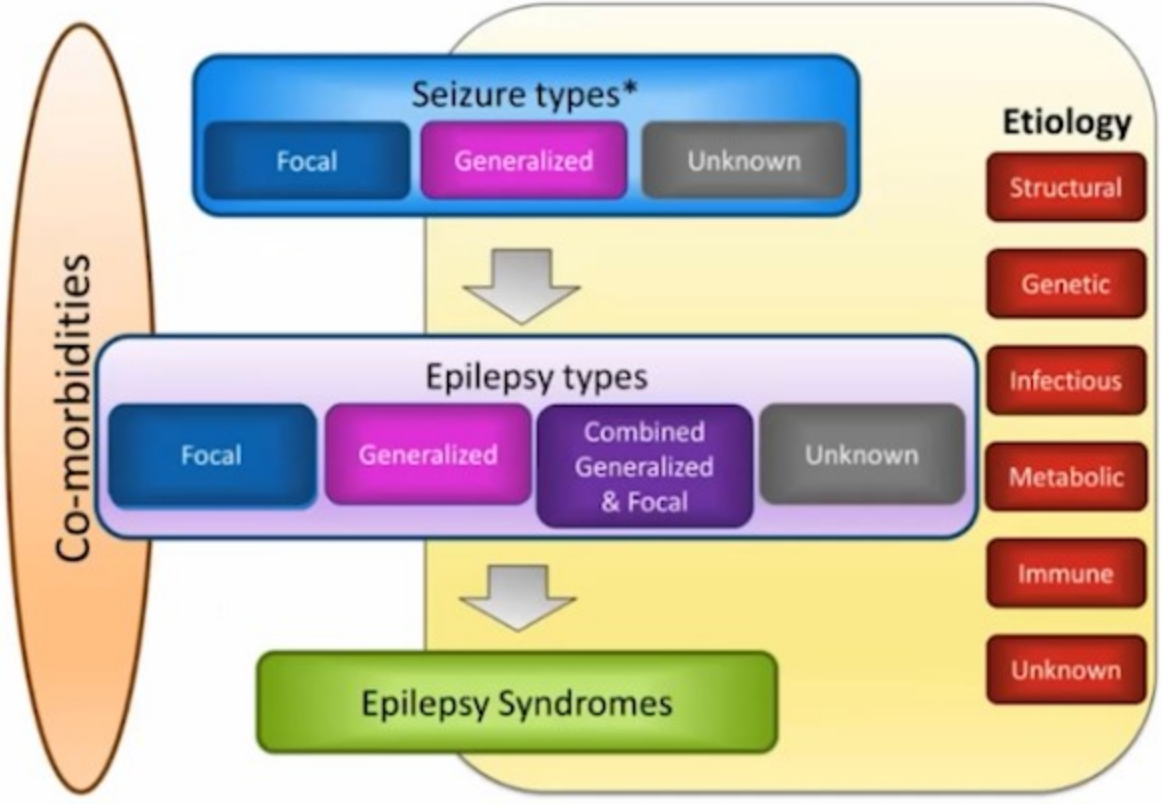
➢ Head injury or

➢ Acute alcohol intoxication or withdrawal

Acute symptomatic seizure

- Metabolic or systemic disorders

- Electrolyte imbalance
- Hypoglycemia
- non-ketotic hyperglycemia
- Uremia
- hypoxic encephalopathy
- hepatic encephalopathy
- hypertensive encephalopathy
- Eclampsia
- Posterior reversible encephalopathy syndrome (PRES)



Scheffer IE, Berkovic S, Capovilla G, et al. ILAE classification of the epilepsies: position paper of the ILAE commission for classification and terminology. *Epilepsia*. 2017;58(4):512-521.

Generalised Epilepsy

- Includes a range of seizure types including absence, myoclonic, atonic, tonic and tonic-clonic seizures

- The patient would typically show generalized spike-wave activity on EEG

- The diagnosis of generalized epilepsy is made on clinical grounds, supported by the finding of typical interictal EEG discharges

Focal epilepsy

- Unifocal and multifocal disorders as well as seizures involving one hemisphere

- A range of seizure types can be seen including focal aware seizures, focal impaired awareness seizures, focal motor seizures, focal non-motor seizures, and focal to bilateral tonic-clonic seizures

- The interictal EEG typically shows focal epileptiform discharges

Epilepsy types

- **Focal and generalized epilepsy-**patients who have both generalized and focal seizures. The diagnosis is made on clinical grounds, supported by EEG findings

- **Unknown**- the patient has epilepsy but the clinician is unable to determine if the Epilepsy Type is focal or generalized because there is insufficient information available

Epilepsy syndrome

- An epilepsy syndrome refers to a cluster of features incorporating-

- Seizure types
- EEG
- Imaging features

Epilepsy syndromes

- Some examples of epilepsy syndromes-

➢ Genetic Generalised Epilepsies- Childhood Absence Epilepsy, Juvenile Absence Epilepsy , Juvenile myoclonic epilepsy

Common features: Generalised seizures, specific age group, normal imaging, generalized interictal discharges, photosensitvity

➢ Benign epilepsy with centrotemporal spikes- Childhood onset, focal seizures, normal MRI, typical EEG, normal development

Epileptic encephalopathy

- Group of disorders in which the unremitting epileptic activity contributes to progressive cerebral dysfunction

- Typically there is regression of milestones and a high frequency of seizures

- Common epileptic encephalopathies
  - Ohtahara syndrome
  - West syndrome
  - Lennox Gastaut syndrome

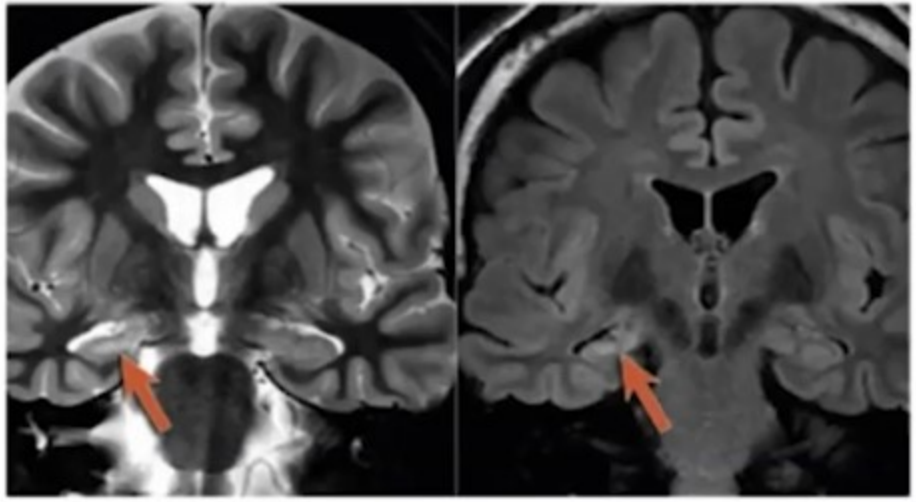
Reflex epilepsy

- Group of epilepsy syndromes in which a certain trigger or stimulus brings on seizures-

- Hot water epilepsy
- Photosensitivity
- Eating Epilepsy
- Somatosensory
- Musicogenic epilepsy

Temporal lobe epilepsy- Mesial temporal sclerosis

- Febrile seizures in childhood
- Latent period
- Seizures- mostly Focal motor unaware with automatisms
- Aura- fear/ rising epigastric sensation
- Drug refractory
- Excellent results from epilepsy surgery



Case Vignette-3

- A 16 year old girl has history of generalized onset seizures- 4 episodes till date in the last 1 year
- Most of them were precipitated by sleeplessness
- She has history of myoclonic jerks on waking up occasionally
- There is no significant family history

- What is the diagnosis

1. Focal epilepsy
2. Acute symptomatic seizures
3. Juvenile myoclonic epilepsy

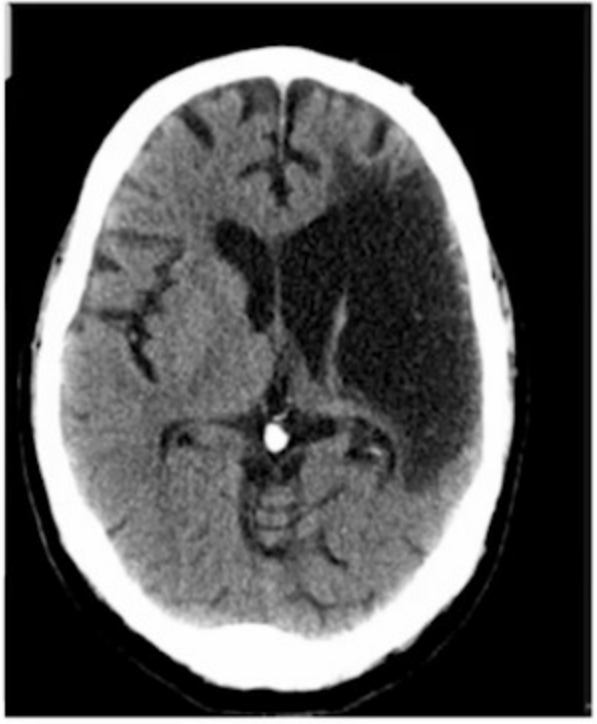
Etiology

- Seizure is a symptom
- The clinician should be aiming to determine the etiology of the patient's epilepsy
- MRI and EEG are helpful in determining aetiology

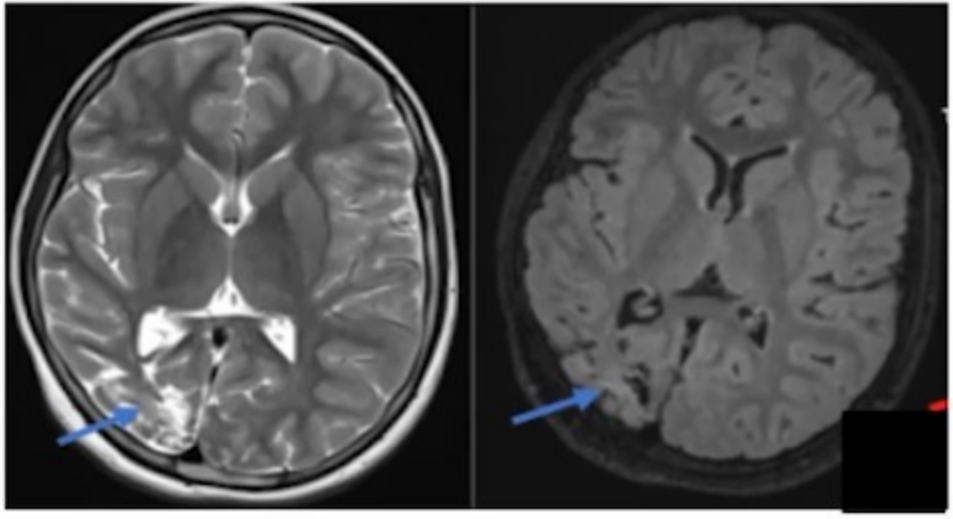
Aetiologies of Epilepsy

1. Structural
2. Genetic
3. Infectious
4. Metabolic
5. Immune aetiology

Structural aetiology of epilepsy

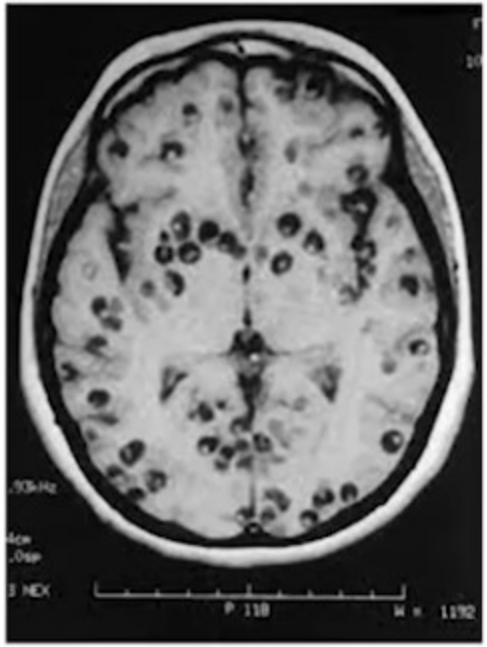


Sequelae of stroke

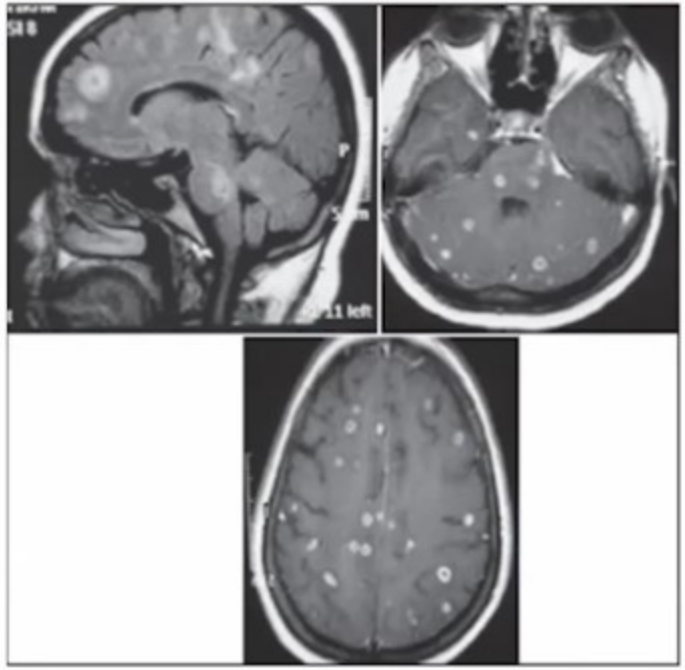


Hypoxic ischemic encephalopathy

Infectious aetiology of epilepsy



Neurocysticercosis



Tuberculoma

Aetiology of epilepsy

- **Genetic:** Dravet syndrome, PME syndromes
- **Metabolic**: Porphyria, amino acidopathies
- **Immune:** Autoimmune encephalitis
- **Unknown aetiology**

Summary

Step 1
- Is it a seizure? Exclude mimics

Step 2
- Identify seizure type

Step 3
- Is it epilepsy? Identify epilepsy type

Step 4
- Determine Aetiology

Step 5
- Recognize epilepsy syndrome