Clinical Epilepsy Case Studies

American Epilepsy Society

Medical Student Cases

Case 1: 5 year-old female with episodes of “Blanking Out”
Case Study 1

- A 5 y/o female is brought to your office because of episodic “blanking out” which began 1 month ago. The patient has episodes in which she abruptly stops all activity for about 10 seconds, followed by a rapid return to full consciousness. The patient’s eyes are open during the episodes and she remains motionless with occasional “fumbling” hand movements.

- After the episode the patient resumes whatever activity she was previously engaged with no awareness that anything has occurred
- She has 30 episodes per day
- No convulsions
Case Study 1

- Past medical, physical and developmental histories are unremarkable.
- No history of previous or current medications; No allergies
- Family history is pertinent for her father having similar episodes as a child.

Case Study 1

- General physical and neurological examination is normal.
- Hyperventilation in your office replicates the episodes.
Case Study 1

EEG for Case Study 1

What additional studies do you perform, if any?

What is the diagnosis?

How do you initiate medication? If so, Which?

Would you counsel the family regarding prognosis?
Case 2: “Nervous” Disorder?

- 25 year-old right-handed marketing executive for a major credit card company, began noticing episodes of losing track of conversations and having difficulty with finding words.
- These episodes lasted 2-3 minutes.
- At times, the spells seemed to be brought on by a particular memory from her past.
- No one at her job noticed anything abnormal.
Case Study 2

- Patient had no significant past medical history, and took no medicines except for the birth control pill.
- She was in psychotherapy for feelings of depression and anxiety, but was not taking medications for mood or anxiety disorder.
- Her therapist notes that she has been under significant stress from the breakup with her boyfriend.

Case Study 2

- What is your differential diagnosis at this point?
Case Study 2

- A careful medical history revealed that she had one febrile seizure at age three; no family members had epilepsy.

- The psychiatrist prescribed a benzodiazepine sleeping pill to be used as needed, and scheduled her for an electroencephalogram (EEG).

Case Study 2

- Prior to the EEG, the patient had an episode while on a cross country business trip, in which she awoke on the floor near the bathroom of her hotel room.

- She had a severe headache and noted some blood in her mouth, along with a very sore tongue. She called the hotel physician and was taken to the local emergency room.
Case Study 2

- What is your differential diagnosis now?
  - How would you classify her event?

- How would you evaluate the patient in the ER if you saw her after this episode?

In the ER, a diagnosis of nocturnal convulsion was made.

A head computerized tomographic (CT) scan was normal.

Laboratory tests including a CBC, chemistries and toxicology screen were normal.
Case Study 2

- She was given fosphenytoin 1000 mg PE intravenously and observed.
- She was discharged home on phenytoin 300 mg per day and referred to a neurologist.
- What would the continued evaluation and treatment consist of?

Neurologist took a complete neurologic and medical history and found patient had an uncomplicated febrile seizure as a toddler, but no other seizures.

There was no family history of epilepsy in her immediate family members.

Medical history is otherwise benign and she has no medication allergies. She had regular menstrual periods since age 13 and has never been pregnant, although she wants to have children.

General and neurologic examination was normal.
Case Study 2

- EEG showed right anterior temporal spike and wave discharges.
- An MRI of the brain was normal.
- Complaint of persistent sedation led to change from phenytoin to lamotrigine, at a dose starting at 50 mg BID increasing by 50 mg/day every two weeks to reach a target dose of 300 mg/day.

Case Study 2

- Side effects were explained to the patient. She was also started on folic acid 1 mg per day and was advised to take a multivitamin daily.
Case Study 2

What are the most reasonable choices of antiseizure treatment for this patient?

Was an appropriate choice made?

What considerations must be made since she is a woman of child-bearing potential?

Case Study 2

Are there considerations regarding the oral contraceptive pill?

What is the reason for the extra folic acid and multivitamin?

What advice should be given regarding lifestyle (sleep habits, alcohol intake) and driving?
Case 3: 70 yo man with his first seizure

70 y/o male presents to the ER with a history of a single seizure.

His wife was awakened at 5:30 am by her husband making an odd gurgling noise with his head deviated to the left and left arm tonically stiffened.

This was followed by generalized body jerking

Patient was unresponsive

Event lasted 2 minutes with 10 minutes until full recovery
Case Study 3

- In the ER, initially the patient is weaker in the left hand than the right side and is fully responsive and his wife feels that he has returned to baseline.
- PMH: Non-insulin dependent diabetes
- Family history: Negative for seizures
- Social history: No smoking or alcohol use.
- Neurological examination: Normal

Case Study 3

- Current medications: Glyburide
  - 5 mg/day
- Vital signs: BP 200/130, HR 75 (regular)
- RR 14, Temp 100.1
Case Study 3

- Sodium 141 meq/L
- Potassium 4.2 meq/L
- Chloride 99 meq/L
- Bicarbonate 27 meq/L
- BUN 8 mg/dL
- Cr 0.7 mg/dL
- Glucose 60 mg/dL
- Hematocrit 44%
- Hemoglobin 15.4 g/dL
- WBC 12,000/
- 80% Neutrophils
- Platelets 180,000

Case Study 3

- Urine analysis: 15 WBC/HPF, nitrite positive
- ABG: pH 7.3, pCO2- 36, pO2- 86, O2 saturation 93%
- CT scan: normal
- EEG: minimal bitemporal slowing
Case Study 3

CT Scan

- What work-up is needed after a single seizure?
- What are the causes of seizures, including what conditions lower the seizure threshold?
- Would you treat this patient or not? If you choose to start a medication, which drug would you choose and why?
- What are the predictors of seizure recurrence?
Case 4: A 62 yo male with Continuous Seizures

Case Study 4

A 62 y/o male without significant previous history of seizures presents to the E R following one generalized tonic-clonic seizure.

Initial assessment after the first seizure revealed poorly reactive pupils, no papilledema or retinal hemorrhages and a supple neck.
Case Study 4

- Oculocephalic reflex is intact.
- Respirations are rapid at 22/min and regular, heart rate is 105 with a temperature of 101.
- As you are leaving the room, the patient had another seizure.

Case Study 4

- What should the initial management be?
- What initial investigations should be performed in this setting?
- What is the appropriate management with continued seizures if initial therapy does not terminate the seizures?
Case Study 4

Laboratory study results:

- CBC
  - WBC - 13.1
  - Hgb - 11
  - Plt - 200,000

- Creatinine - 1.0
- Mg - 1.0
- Na - 132
- K - 4.5
- Ca - 9.0
- Glucose - 90

What are indications for lumbar puncture in this case?

- CSF color - clear
- Cell count tube # 1 - 500 RBC/ 35 WBC - 100% Neutrophils
- Tube # 3 - 100 RBC/ 11 WBC
- Protein - 65
- Glucose - 60
Case Study 4

- Urinalysis- (+) ketones
- No White Blood Cells or bacteria
- Tox screen: negative for alcohol positive for benzodiazepines

You obtain an MRI of the brain with the following images
Case Study 4

- Which of the above studies helps to explain the current seizures?

- Would you ask for other studies?

- What are the CSF findings during repeated convulsions?
Case Study 4

- Define Status Epilepticus.

- Describe the systemic manifestations of status epilepticus.

- What causes status epilepticus?

- What is the role of EEG in status epilepticus management?

Medical Student Cases

- Case 5: 51 year old female with frequent seizures
Case Study 5

- **Seizure History:** Her birth was unremarkable except that she was born with syndactyly requiring surgical correction.
- Early developmental milestones were met at appropriate ages.
- She had her first convulsive episode at age 2 in the setting of a febrile illness.

Case Study 5

- How would you evaluate and treat a patient with a febrile seizure?
- What clinical features are important in guiding your evaluation?
Case Study 5

- She began to develop a new type of episode in the third grade.
- The attacks consisted of her seeing a pink elephant that was sitting on various objects and waving to her.
- The patient has subsequently found a ceramic model of an elephant that was the same as the elephant that she saw during her seizures.

Case Study 5

- How are her symptoms different from most patients with schizophrenia?
Case Study 5

- She was not diagnosed with seizures until the age of 15.
- Initially, the seizures were controlled with medicine.
- After a few years, however, the attacks re-occurred despite treatment with anticonvulsants.

Case Study 5

- At age 20, the seizures changed in character to the current pattern.
- The seizures begin with an aura of “a chilling sensation starting at the lower back with ascension to the upper back over the course of 10-20 seconds”.
Case Study 5

- Observers then note a behavioral arrest.
- She tends to clench her teeth and breath heavily, such that her breathing sounds “almost as if she were laughing”.
- She is unable to fully respond to people for 5-10 minutes.
- Typically, she experiences 4-5 seizures per month.

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Case Study 5

- She has had several EEGs in the past; the most recent available report is from seven years ago, which revealed mild, diffuse slowing of background elements with no abnormalities noted during three minutes of hyperventilation and photic stimulation.
- She had an MRI 13 years ago with no reported abnormalities.
Case Study 5

- She has tried several different medications, but is currently maintained on carbamazepine and lamotrigine. Her carbamazepine dose is 700 mg/day and Lamotrigine 125 mg/day with BID dosing.
- She feels excessively tired on higher doses.
- She has been on carbamazepine 32 years and on lamotrigine for four years.
- She states that she has had some success with the lamotrigine.

In the past, she has been unsuccessfully tried on phenobarbital, primidone, valproate, gabapentin, phenytoin and ethosuximide.
- She had marked weight gain while taking valproate.
- She hated having seizures in public and she “felt like a prisoner in my own home”.
- Upon hearing of seizure surgery, she requested a referral for evaluation.
Case Study 5

- When are seizures “medically refractory”?
- When should you consider an inpatient video EEG evaluation?
- What might you learn from such an evaluation?

Past Medical History:
1) Migraine headaches (with the last one occurring four years ago)
2) status-post hysterectomy with removal of one ovary 25 years ago
3) history of syndactyly at birth with surgical corrections;
4) partial thyroidectomy 32 years ago during pregnancy.
Case Study 5

Social History:

- She currently lives with her mother.
- She works as a sales clerk.
- She completed twelve years of school and finished one semester of college.
- She has not driven a car after being reported to the DMV by her doctor 23 years ago.

Case Study 5

- She tells you that she still has her driver’s license.
  1) What are your legal and ethical obligations as a physician?
  2) What are some of the employment issues experienced by people with epilepsy?
Case Study 5

- **Family History**: She has a cousin with a history of "grand mal" seizures who died at age 12.

- **Habits**: She does not use alcohol, tobacco, or illicit drugs.

- **Medications**: Carbamazepine 600/400 mg/day BID, Lamotrigine 50/75 mg/day BID, Conjugated estrogens 1.25 mg PO qd, thyroxine 100 mcg PO qd, and sumatriptan PRN.

- **Neurologic Examination**: Normal

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**Impression**
- Possible Mesial Temporal Lobe Epilepsy
  - Auras of forced recall and rising autonomic experience
  - Complex Partial Seizure
  - Seizures refractory to multiple antiepileptic medications

**Recommendation**
- Epilepsy Surgery Evaluation
Case Study 5

- The patient underwent video-EEG monitoring.

Case Study 5

- During 5 days of video EEG, she had 3 typical CPS.
- Her seizures began with her typical aura followed by lip smacking and left hand automatisms. Right hand had tonic posture
- She had a brief post-ictal aphasia
Case Study 5

EEG onsets consisted of a rapid build up of rhythmic theta frequency activity over the left temporal region (Arrows)

MRI reveals an atrophic L. Hippocampus
Case Study 5

Pre-surgical Evaluation:

- Neuropsychological Testing
  - Performance and Verbal IQ normal

- Wada (Intracarotid amobarbital) test
  - Language on Left side only
  - No memory difference with left and right injections

Case Study 5

Pre-surgical Evaluation: Conclusions

- She has complex partial seizures refractory to anticonvulsant treatment
- Clinical and EEG features are compatible with seizure origin from the left, language-dominant temporal lobe
- MRI suggests mesial temporal sclerosis is the underlying pathology
- She has an excellent chance for a seizure-free outcome with a left anterior temporal lobe resection
Case Study 5

Surgery

- Surgery under local anesthesia
- Language map determined by electrical stimulation
- Language areas (green arrow) and epileptogenic tissue (white arrow) labeled on next slide

Case Study 5

- MRI showing language areas
Case Study 5

Surgery

- Anterior temporal lobe resected (arrow)
- Amygdala and hippocampus also resected

Follow-up

- Immediately following surgery she had mild dysnomia
- At three months post-op, cognitive testing confirmed no change from pre-op
- She has had no seizures for two years. She declines a trial off of anticonvulsants for fear of recurrent seizures. She drives to her appointment in a new car.
- She writes, “I’m now having a life I never knew was possible”