

DIAGNOSIS OF ACUTE HEADACHE

PRECIPITATING EVENTS

- New drug prescription
- Lumbar puncture
- Head trauma
- Stressful event
- FEVER Associated with Headache
 - viral encephalitis
 - Viral, fungal, chemical or carcinomatous meningitis
 - Parameningeal infection: otitis, sinusitis
 - Granulomatous arteritis
 - Systemic viral illnesses or malaria
- NUCHAL RIGIDITY and Headache
 - Meningitis
 - Subarachnoid hemorrhage *Note: 10% patients may not have Kernig's/Brudzinski's*
 - Cerebellar tonsillar herniation
 - Severe osteoarthritis of the spine
 - Chronic CNS disorders
- Parkinson's disease
- Progressive supranuclear palsy
- Multi-infarct dementia

ALTERED MENTAL STATUS

- Diffuse cerebral dysfunction
- Toxins, infection, multiple infarcts, edema, hydrocephalus
- Sub-dural hematoma
- Other large space-occupying mass
- Look for BLURRED DISC MARGINS:
 - Papilledema (increased intracranial pressure)
 - Pseudotumor cerebri
 - Secondary to mass lesion or obstruction of foramina CAUTION - may take 48 hours to develop acutely - very slow masses may not develop it
 - Pseudopapilledema
 - Optic neuritis
 - Ischemic optic neuropathy (usually painless)
 - Malignant hypertension
 - Dysthyroid orbitopathy

FOCAL NEUROLOGIC SIGNS may be very helpful for localization

- Tumor
- Stroke relatively uncommon in simple infarcts more common in intracerebral hemorrhage most common in venous thrombosis
- Encephalitis - often have fever or subdural empyema.
- Brain abscess

PAIN, "PAINKILLERS" AND YOUR BODY

Pain is a common, every day occurrence. In the normal setting it is a useful indicator of abnormal functioning or compromise of part of the body. It is the signal that effects action to correct the offending problem and thus preserve the organism (your body).

Just as in other areas of communication between different parts of the body, there is a built-in system of checks and balances (feedback mechanisms) for pain production and perception. One of these pathways uses the pain itself to stimulate production of "antinociceptive" (antipain) chemicals in the brain, such as endorphins (which may be more important in acute, severe pain) and other non-endorphin chemicals (which may be more important in chronic dull pain).

It is thought that when this system breaks down, chronic daily pain can occur in the absence of a provoking trigger. One of the most common reasons for such system failure is the daily intake of painkillers, or analgesics. Research in many headache centers around the world has shown that patients who use analgesics more than two to three days per week suppress this antinociceptive activity. They therefore need to rely upon the painkilling properties of the drug more and more as their own body's ability to suppress the perception of pain diminishes. A vicious circle of drug dependence then develops in which the patient has a constant headache which will get worse if he or she does not consume the drug, but is never completely relieved. This is known a drug-induced headache. Analgesics become completely ineffective painkillers.

A complicating feature of drug-induced headache is that other nonanalgesic treatments are usually ineffective as well as long as the patient takes analgesics. This is because these drugs are aimed at the same antinociceptive system that the analgesics are blocking. Once the patient is withdrawn from the analgesics, the pathway is reopened, and medications which did not work in the past may improve the overall headache.

Remember that analgesics can be obtained both by prescription and off the shelf. They include all products containing aspirin, acetaminophen (Tylenol), ibuprofen, the butalbital headache compounds such as Fiorinal, etc., and narcotic analgesics of all kinds. Ergotamine (Cafergot, etc.) is also known to produce drug-induced headache. Use any of these products no more than twice per week.

Case studies

1. A 42 year-old woman is active in her church and does volunteer work with the Salvation Army. She has 5 children aged 3 to 14 years. She is brought into the ER unresponsive after a concerned neighbor called 911 after she was found in her yard with her 3 year-old crying beside her. The ER stabilizes her, intubates her and orders a CT scan. Since you are cruising by and interested, you decide to examine her (after checking for malpractice coverage), as the charge nurse tells you she will need a neurology consult soon anyway. Her chart indicates a history of hypertension and smoking, and a recent hysterectomy. You see an obese woman with a blood pressure of 210/140. She is being mechanically ventilated. Her eyes are closed and do not open with stimulation. She has a minimal movement of the arms inward in response to painful stimulus to the chest or limbs. Upon forced eyelid opening, which she does not resist, her pupils are pinpoint, and possible reactive to a very bright light. Every few seconds you note that her eyes look downward quickly then drift up to midline. There is no eye movement when you move her head from side to side or instill cold water into the ear canal; except this occasional "bobbing" - like movement. However, when you do this you note that she had a cough response. She also has bilateral Babinski's.

- Where is the lesion?
- What type of pathology could cause this picture?

2. A 24 year-old woman is found in the street severely bruised upon her body and head, and brought to the ER. She responds to loud calling of her name by opening her eyes slowly. You note her pupils are 3 mm and reactive, and sometimes she has roving eye movement. She doesn't track an object or look at you for long. She is able to tell you her name ("Jane"), and that she was at a party. She is able to give no other details, but is able to give her phone number and address, and that her head hurt a lot. She is dysarthric. Her neck is supple, and she has generally decreased tone. She yells out an obscenity to painful stimuli to the limbs. Her breathing is regular and sonorous and her breath smells of stale vodka and orange juice. You note that one of the bruises is around her right eye and another in the right ear area, and that ear canal is swollen. She is taken to X-ray for some films.

- a. What anatomic localization do you think is associated with this woman's level of consciousness?
- b. What type of pathology most likely caused this picture?
- c. What specific films will you ask the ER to obtain?

3. The ER staff tells you not to worry about Jane, the X-rays were negative and they will let her sleep it off. At 6am you are called for another consult, and note that Jane is still there in the corner cubicle. You pass by and try to wake her. You note her breathing is sometimes shallow, sometimes vigorous. She does not respond to calling her name, but with sternal rub she flexes the elbow of the left arm and stiffens both lower extremities. She also opens the eyes, and you see that the right pupil is now 7 mm and unreactive to light. When you move her head to the left, the eyes both move to the right. When the head is turned to the right, the left eye moves outward and the right eye stays midline.

- a. What happened to Jane overnight?
- b. Where is the lesion?
- c. What needs to be done next?
- d. How could you have predicted this?

4. A 15 year-old boy has been complaining of dizziness and headache for 2 days. On the day of admission he begins vomiting profusely and within a couple of hours is lethargic. VS are temp 38.7 C, 148/91, 108, 26. He is arousable, and will say his name, but responds with gibberish most of the time. When the nurse tries to put in an IV he starts screaming and kicking and needs to be restrained. When his mother talks soothingly to him he settles down, but cries and tells her not to "let them take his ball away". As you enter the room and call his name he yells "NO! NO! NO! NO!" but then drifts off to sleep. On exam his neck is stiff. You note that he doesn't look to the left much. He becomes violent when you inflict moderate pain on the right side, but on the left he just frowns. He has a Babinski sign on the left. Before you leave, he has a focal seizure starting in the left face, which secondarily generalizes.

- a. Where is the lesion?
- b. What may be the cause?
- c. Will you do calorics to test his eye movements? Why or why not?
- d. How will you manage his behavior?

HEADACHE CASES

1. A 24-year old nurse calls your office. She has had four episodes of an excruciating right-sided headache in the last six months. Twice there was an associated tingling of the left side of the face and left hand. The pain, which is throbbing, builds up over an hour or two until she is forced to lie down in a dark room. She experiences nausea and vomiting, and blurred vision. The headache usually subsides once she is able to sleep. She also gets less severe headaches, also on the right, relieved by 2-4 aspirin per day. She denies family history of headache. Her sister works on a neurology ward and insisted she call for an appointment.

2. An 18-year-old college student comes to the ER with a headache which is holocephalic, steady, and unaccompanied by any other symptoms or findings. You give him a prescription of Fiorinal, (butalbital, aspirin and caffeine). He returns on a different shift 2 days later with continuing symptoms. The Fiorinal was slightly effective, but, he thinks he took too much. He is slightly groggy, but there are no other findings. He has no history of drug use or chronic headaches. The physician prescribes a shot of Demerol hoping he can stop the headache so the student can study for his finals. When he returns 12 hours later, there is little change in his story or exam. He demands another shot.

3. A 68-year-old woman is referred to you by her dentist. She has suffered some tooth decay because she refuses to brush her teeth due to facial pain. She explains that she has developed an excruciating pain in the right side of her face. It is exacerbated by facial movements or touch, and is most severe in the morning. She is suing the dentist as she claims it all started after a root canal.

4. A 35-year-old businessman has a six-year history of twice weekly headaches which have increased to almost daily. They are usually non-throbbing and occur towards the end of the day. He has tried many off-the-shelf medications, but finds himself taking a handful of pills without much relief. His friend gave him a prescription drug that worked. He would like for you to give him some. There are no other symptoms or neurologic findings.

5. A woman has a new onset seizure. She is thoroughly examined including a CT, LP, and EEG. No findings were abnormal. Two days later, she calls the office with complaints of a headache that developed the day before. She has not been able to get out of bed due to the pain.

6. A 40-year-old policeman states that he has headaches which are unilateral, occur once or twice per night, but at least once around 3 AM. They last only an hour, but they are excruciating and he paces the floor. He claims his eye swells and tears. This has been going on for a week. His mother had migraines, but nothing like this.

7. A 28 year old white female complains of headaches for 1 year, recently daily. They are often throbbing, usually bitemporal, and do not usually cause too much nausea, although she has vomited once or twice. She also says her vision has changed, but she went to get her glasses checked and they told her they were fine. Other pertinent history is obtained that she had a child 9 months ago, and gained 80 pounds during pregnancy. She has lost 30. On physical exam she is obese. Vital signs are normal. Fundoscopic exam shows bilateral disc margin blurring with a flame hemorrhage in the right. Pupils are equally reactive. Visual fields are full on finger confrontation. There is a question of mild lateral rectus weakness on the right. The rest of the cranial nerves are normal, as is her strength, sensation, and reflexes. There is no Babinski. Coordination and gait are intact. CT of the head is normal. EEG is normal. CSF is normal except for an opening pressure of 410 mm H₂O.

What is the name of this syndrome? And What severe disability is she at risk for? What would you expect to see on formal visual field testing (perimetry)?

HEADACHE CASE ANSWERS

1. Migraine with aura is likely. The side-locked location is a little worrisome for possible referred pain due to intracranial pathology. Remember that according to International Headache Criteria for migraine headache the patient has to have at least five headaches which are similar in nature. She is also overusing analgesics to a small extent, which could lead to medication-induced chronic headache. She needs an exam to rule out focal neurologic signs and more specific migraine therapy.

2. This person could be drug seeking. Signs which may point to this are a family history of drug abuse or alcoholism. However, he could also have his first prolonged migraine. This would be unusual, but not unheard of even though it is not unilateral or throbbing.

On the other hand, you are obligated at this point to work him up because he is presenting with “the First and the Worst” headache of his life. He should have a blood screen for infection and metabolic disease, a CT scan without contrast to look for blood, and an LP to look for blood and infection.

3. She has trigeminal neuralgia. It will likely respond to anticonvulsants such as Neurontin or Tegretol. If she has no other signs of cranial nerve dysfunction she doesn’t need imaging, though it is not unusual to do it as a precaution. Remember that TN is not associated with true sensory loss, although the patients will say they have a relative numbness in the area.

4. This is the more classic “rebound” or analgesic induced chronic tension-type headache. He should change his lifestyle somewhat, participate in exercise and stress reduction activities, stop the daily butalbital and perhaps get on a more stabilizing preventive such as amitriptyline.

5. The two most important clues to the correct diagnosis is that she recently had an LP, and when she tries to get up from bed the headache worsens. This is acute post-LP, or “hypoliquorric” headache. It is treated with strict flat bedrest for three days; if they are not better at the end of that time an autologous blood patch to the epidural lumbar area by an anesthesiologist is almost always curative. IV or high dose PO caffeine can sometimes help, but I can’t think of anything more uncomfortable than to be buzzing but have to stay in bed, so I don’t usually suggest it.

6. These are cluster headaches, the most painful headache there is most likely. Acutely a triptan intranasally or 100% oxygen can abort it; preventively the most helpful are valproate, verapamil, lithium and/or pulse steroids. It will usually go away on its own in 6-8 weeks.

7. Idiopathic intracranial hypertension. She is at risk for visual loss, often not noticed by the patient until it is severe, due to foveal sparing. On perimetry testing she will have an enlarged blind spot and sometimes a “nasal step” of visual loss. If acetazolamide does not decrease her intracranial pressure, surgery to open a window in the optic nerve sheath (“optic nerve sheath fenestration”) is indicated to preserve her eyesight.