Seed
GLOBAL HEALTH

Registrar Education Series

Headache

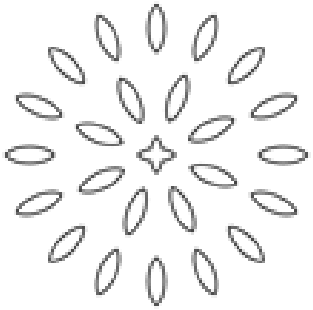
Continuing education for personal growth and quality improvement

DynaMed

How to…

- What is the differential based on the chief complaint?
- What additional information do you want?
- How does the history narrow down the differential?
- What labs/imaging would be most helpful?
- What is the diagnosis?
- What is the assessment?
- What is the treatment/plan?



HEADACHE CASES

challenging the status quo

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Headache Case 1

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Blessing is a 33yoF with no significant PMH who presents for headaches.

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Histories

HPI: She describes the headaches as a bilateral squeezing pain wrapping around her head to her neck/shoulders lasting anywhere from 30 minutes to days. Occasionally may get photo or phonophobia. Has a headache at least weekly.
Denies nausea, vomiting. Not pulsing in nature. Not aggravated by physical activity.

PMH: anxiety and depression

PSH: none

FH: none

Social: Originally Lusaka. Lives with her husband and 7 children. Has a high stress job working many hours including through the night when she should be sleeping. Denies alcohol, tobacco, drugs.

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Physical Exam

Vitals: T 37.1, BP 113/72, P 70, R 13

GEN: Female appearing stated age in mild psychologic distress

HEENT: Suboccipital muscle tenderness
Fundoscopic exam without papilledema or hemorrhage. C/D ratio 0.5.

NECK: no stiffness/rigidity.

MSK: tenderness to palpation of neck, traps and rhomboids.

NEURO: CN 2-12 intact, sensation intact and equal b/l, strength 5/5 diffusely, reflexes 2+ diffusely, coordination intact. Kernig/Brudzinski negative.

Labs

Imaging

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Labs:

*FBC	
WBC	7.5
Hgb	13
Hct	36
Plt	220

*RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	11
Cr	96
Glucose	6.9
Ca	9.5
T bili	7
AST	35
ALT	32
Alk Phos	125

*Urine	
LE	Negative
Blood	Negative
Nit	Negative
Bili	Negative
UPT	Negative

*Other	
A1c	5.1
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
TSH	3.1
ESR	5
CRP	3

Imaging

*indicates the test was likely not indicated with this clinical presentation

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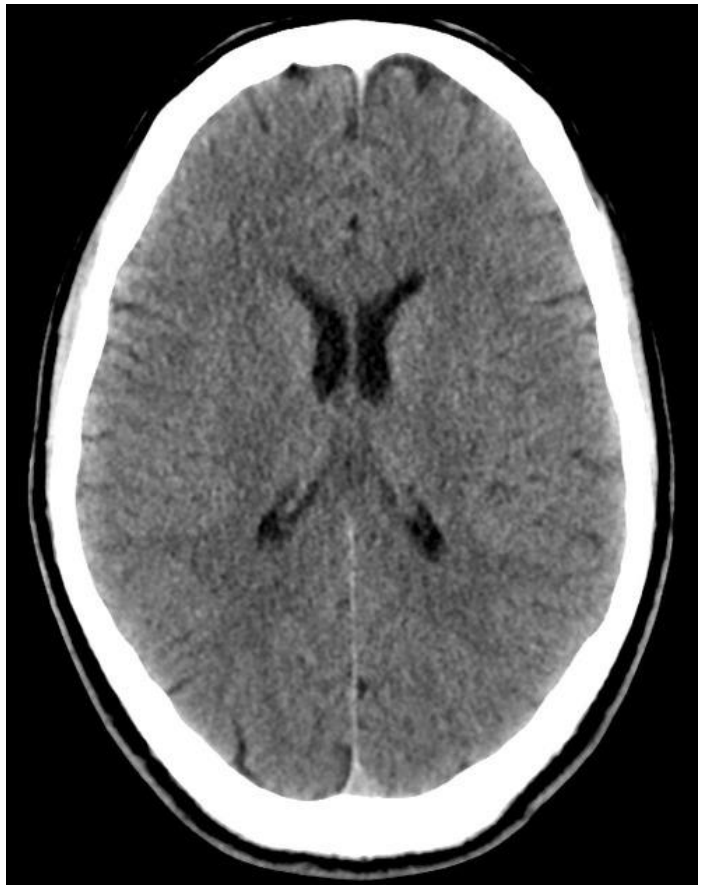
Imaging



*Head CT normal

Labs

*indicates the test was likely not indicated with this clinical presentation

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Assessment

- Blessing is a 33yoF with a PMH of anxiety and depression who has a number of stressors both at home and work who presents with a typical tension headache in a frequent pattern without any signs or symptoms that would be red flags for secondary causes based on the SNNOOP 10 criteria.

- Other diseases on the differential but not supported by history, physical and/or labs include migraine, temporal arteritis, medication overuse headache, cluster headache, intracranial bleed, intracranial mass, trauma

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Plan

- No labs or neuroimaging are indicated at this time.
- Can take ibuprofen as needed, but limit intake to 2-3 days per week. If needed caffeine 64 - 200mg can be added.
- There is evidence for parenteral metoclopramide, diphenhydramine and chlorpromazine from emergency departments.
- To decrease frequency of headaches can learn relaxation techniques, decrease stress, massage/PT/OMM/neck traction, treat anxiety and depression.
- Return in 1 month with a headache diary to evaluate efficacy of treatment, if needed can add prophylaxis with amitriptyline at that time.

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Tension Headache Summary

Tension headaches are the most common primary headache

Risk factors

- Stress, mental tension, emotional disturbance, poor sleep, inability to relax, poor self rated health, anxiety, depression

Peak age 30 - 39yo

- F:M 5:4

Labs and/or imaging are unnecessary in the absence of red flags

- acute thunderclap headache, fever, meningeal signs, papilledema with focal neurologic signs, impaired consciousness, and concern for acute glaucoma

First line acute treatment are NSAIDs, limited to 2-3 days per week

- Can add caffeine, metoclopramide, diphenhydramine and chlorpromazine
- Avoid opioids, triptans and muscle relaxants

Prevention aims at identifying and avoiding triggers

- Massage/PT/OMM, neck traction, relaxation techniques, treating anxiety/depression

Prophylaxis: first line amitriptyline 30-75mg/day

- Second line mirtazapine 30mg, venlafaxine 150mg

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Headache Case 2

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Sara is a 41yo female with a PMH of obesity who presents for chronic headaches.

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Histories

HPI: She started having headaches in her 30s and now has them more than half of the days in a month. They are described as moderate to severe unilateral pulsating headaches that will last for the remainder of the day. She gets nausea and has light sensitivity. When they occur she says she is useless and has to leave work and cannot help around the house until it resolves. She always has them around her periods.

PMH: Obesity

PSH: None

FH: Migraines

Social: Lives with her husband and 2 children. Works as a nurse. Usually skips breakfast and has nshima for meals. Enjoys shopping. Denies alcohol, smoking and drugs.

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Physical Exam

Vitals: T 37.1, BP 113/72, P 70, R 13

GEN: Female appearing stated age in moderate distress

HEENT: No pericranial muscle tenderness
Fundoscopic exam without papilledema or hemorrhage. C/D ratio 0.5.

NECK: no stiffness/rigidity.

MSK: No tenderness to palpation of neck, traps and rhomboids.

NEURO: CN 2-12 intact, sensation intact and equal b/l, strength 5/5 diffusely, reflexes 2+ diffusely, coordination intact. Kernig/Brudzinski negative.

Labs

Imaging

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Labs

*FBC	
WBC	7.5
Hgb	13
Hct	36
Plt	220

*RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	11
Cr	88
Glucose	6.9
Ca	9.5
T bili	7
AST	35
ALT	32
Alk Phos	125

*Urine	
LE	Negative
Blood	Negative
Nit	Negative
Bili	Negative
UPT	Negative

*Other	
A1c	5.1
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
TSH	3.1
ESR	5
CRP	3

Imaging

*indicates the test was likely not indicated with this clinical presentation

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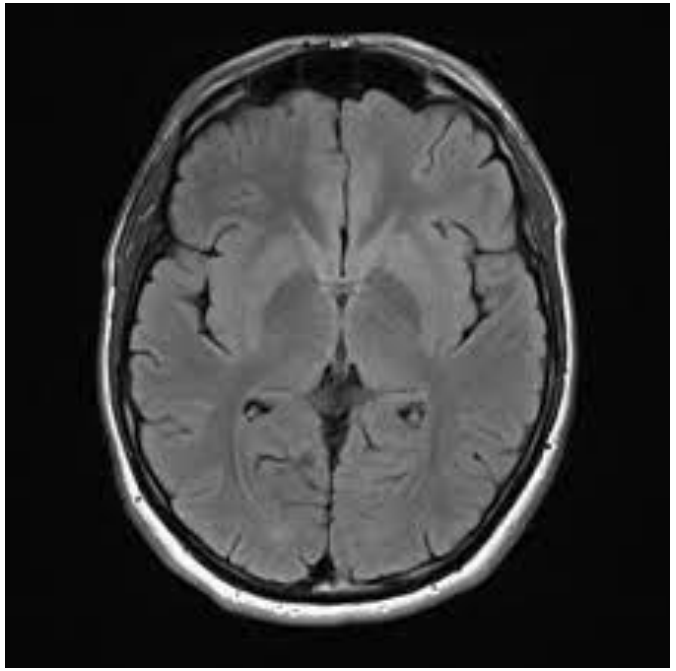
Imaging



*Normal brain MRI

Labs

*indicates the test was likely not indicated with this clinical presentation

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Assessment

- Sara is a 41yoF with a PMH of obesity who presents with chronic episodic headaches with a positive POUNDS and ID MIGRAINE screening without signs or symptoms that would be red flags for secondary causes based on the SNNOOP 10 criteria.

- Differential includes: Other diseases on the differential but not supported by history, physical and/or labs include tension headaches, temporal arteritis, medication overuse headache, cluster headache, intracranial bleed, intracranial mass, trauma

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Plan

- No labs or neuroimaging are indicated at this time.
- For mild-moderate attacks can take NSAID/Tylenol + caffeine, +/- antiemetic
- Moderate-severe attacks can take sumatriptan 50-100mg or sumatriptan 50-85 + naproxen 500mg +/- antiemetic
- If frequent treatment is needed consider prophylaxis with propranolol 20-40mg bid titrated to 40-240mg/day, metoprolol 25-50mg bid titrated to 100-200mg/day, topiramate 15-25mg qhs titrated to 100mg/day, amitriptyline 10mg at bedtime titrated to 10-50mg/day
- Frovatriptan 2.5mg bid can be used 2 days before to 3 days after menstruation
- If she fails at least 3 prophylactic treatments can consider botulin A toxin.
- Counsel on lifestyle maximization with a regular healthy diet, adequate fluid intake, sufficient sleep, regular physical activity and stress reduction.
- Return in 1 month with a headache diary to evaluate efficacy of treatment and need for escalation of therapy. Warned about the risk of medication overuse headaches.

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Migraine Summary

Migraines are the #1 cause of disability worldwide

- Similar effect on quality of life as diabetes, CHF or hypertension

Occurs from 20-50yo, peaking in a person's 40s

Clinical decision rules are helpful with diagnosis

- *POUNDS* pneumonic and *ID Migraine* risk

Episodic <15/month, Chronic ≥15/month > 3 months

No labs or imaging are indicated if *SNNOOP* evaluation is not concerning for red flags

- acute thunderclap headache, fever, meningeal signs, papilledema with focal neurologic signs, impaired consciousness, and concern for acute glaucoma

Mild-moderate: NSAID/Tylenol + caffeine +/- antiemetic

Moderate-severe: sumatriptan 50-100mg or sumatriptan 50-85mg + naproxen 500mg +/- antiemetic

- If nausea is severe an intranasal, subcutaneous or disintegrating triptan can given

Triptan contraindications:

- Ischemic heart disease, previous myocardial infarction, coronary vasospasm, cerebral or peripheral vascular disease, or severe or uncontrolled hypertension

Prophylactic therapy: betablockers, frovatriptan, topiramate, amitriptyline, botulin A toxin

Counsel on regular diet, adequate water intake, sufficient sleep, regular physical activity, stress reduction

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Headache Case 3

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Michael is a 71yo male who is brought to the emergency department by his daughter with altered mental status.

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Histories

HPI: He was found down in his house for an unknown amount of time. He has a PMH of HTN and drinks alcohol every night. She says she was worried he had been drinking more lately because he has not been acting himself for the last week or so. He seemed confused, was walking with a limp and had been complaining about a headache that was not going away. He was last at Kanyama 3 weeks ago for a scalp laceration after a fall when he was drunk needing sutures otherwise does not typically go to the doctor or hospital. He does not take aspirin, other antiplatelets or anticoagulants.

PMH: HTN, alcohol use disorder

PSH: None

FH: No early heart disease or cancers

Social: From Northern Province. Lives with a friend. Has 5 children. Used to work on cars but stopped a couple years ago. Enjoys watching football and drinking. Denies smoking and drugs.

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Physical Exam

VITALS: T 37.1, BP 102/64, P 110, R 18

GEN: 71yoM with altered level of consciousness.

HEENT: Previous head trauma on occiput with 7 sutures still in the scalp. No erythema, warmth or discharge. Unable to assess for neck rigidity.

CV: S1, S2 normal. Regular rhythm. Tachycardic at 110bpm. No m/r/g.

RESP: Clear to auscultation bilaterally. No wheezes, rhonchi or crackles.

Neuro: GCS:7 (E2, V2, M3)
CN II-XII difficult to assess, strength difficult to assess but decreased on R, reflexes 2+/4 (R) and 3+/4 (L), withdraws to pain.

Labs

Imaging

Procedures

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Labs

FBC	
WBC	7.5
Hgb	13
Hct	36
Plt	220

RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	35
Cr	210
Glucose	3.7
Ca	9.5
T bili	10
AST	35
ALT	32
Alk Phos	97

Urine	
LE	Negative
Blood	Negative
Nit	Negative
Bili	Negative
Alb/Cr	475
UDS	Negative

Other	
A1c	5.4
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
HIV	negative
TSH	3.1
Alcohol	negative

Coags	
PT	10
aPTT	26
INR	0.9

Imaging

Procedures

*indicates the test was likely not indicated with this clinical presentation

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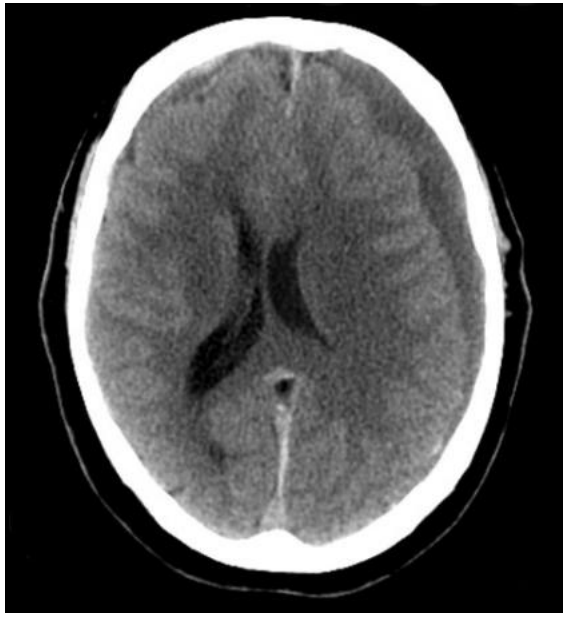
Imaging



*CT Head Abnormal

Labs Procedures

*indicates the test was likely not indicated with this clinical presentation

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Procedures

LP

CSF	
Opening pressure (cmH20)	12
Appearance	clear
Protein (g/L)	0.25
Glucose (mmol/L)	2.8
Gram stain	negative
Culture	pending
WCC	< 3
Diff	---

Labs Imaging

*LP is contraindicated in this situation

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Assessment

- Michael is a 71yoM with a PMH of HTN and alcohol use disorder who presents with altered mental status in the setting of other insidious neurological changes over the week. Given his risk factors, history and investigations his presentation is most consistent with a chronic subdural hematoma from the fall he sustained 3 weeks ago with deteriorating neurologic function.

- Differential includes: alcohol overdose, CVA, meningitis, drug overdose/withdrawal, epidural hemorrhage, seizure, intracranial mass, UTI

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Plan

- Imaging of choice is CT head without contrast.
- Investigations should exclude other causes of altered mental status in an elderly man as well as increased risk for bleeding.
- If he was asymptomatic or had a small bleed of <10mm and had no signs of cerebral compression observation with serial exams is acceptable as most will resolve spontaneously
- Given the deterioration in neurologic function, mass effect and midline shift he would be a candidate for rapid neurosurgical intervention.

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Subdural hematoma is a collection of blood between the dura and subarachnoid mater

- Slow bleeding from bridging veins

Present with headaches, altered mental status, neuro symptoms, usually after head trauma and/or use of antiplatelet or anticoagulant

Risk factors: >70yo, males, infants/toddlers, alcohol, epilepsy, bleeding d/o, anticoag/platelet

Imaging: CT head without contrast

Check coagulation studies

Most resolve spontaneously and 10-33% recur, has a mortality rate that varies but can be as high as 32%

Medical Management

- Life support with A, B, Cs
- Observation: small <10mm, asymptomatic, no signs of cerebral compression
- Consider reversal of antiplatelet or anticoagulant
- Treat seizures with antiseizure medications
- Treat BP and manage intracranial pressure while maintaining cerebral perfusion

Surgical intervention for persistent symptoms or neurologic impairment due to acute or chronic SDH

- Size >10mm, mass effect >5mm, asymmetric fixed dilated pupils

Rapid surgical intervention if deteriorating neurologic function and/or clinical/imaging signs of significant mass effect

Subdural Summary

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Headache Case 4

Chief Concern | Histories | PE | Assessment | Plan

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Chief Concern

Mwamba is a 62yoM with a PMH of hypertension, CCF and a-fib who presents to the emergency department for an acute headache.

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Histories

HPI: Over the last two days he developed a fever with nausea and vomiting and has felt weak. His headache is associated with neck stiffness and his wife says he starting saying things that do not make sense. He has been compliant on his HTN, CCF and anticoagulant medications. Denies recent trauma.

PMH: Hypertension, CCF, a-fib

PSH: None

FH: HTN

Social: Eastern Province. Lives with his wife. Has 4 children and 7 grandchildren. Works as a teacher. Enjoys music. Denies alcohol, drugs, and tobacco.

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Physical Exam

VITALS: T 40.1, BP 102/64, P 115, R 18

GEN: 71yoM appearing stated age in moderate distress.

HEENT: Normocephalic/atraumatic. Neck rigidity present. No papilledema or temporal tenderness.

CV: S1, S2 normal. Irregularly irregular rhythm. Tachycardic at 115bpm. No m/r/g.

RESP: Clear to auscultation bilaterally. No wheezes, rhonchi or crackles.

Neuro: GCS:13 (E4, V3, M6)
CN II-XII intact, strength 4+/5 diffusely, sensation intact and equal bilaterally, reflexes 2+/4 diffusely, finger to nose and heel to shin intact.

Labs

Imaging

Procedures

Seed Global Health

Labs

FBC	
WBC	19
Hgb	11.2
Hct	32
Plt	450

RFTs/LFTs	
Na	138
K	4.6
Bicarb	25
Cl	101
BUN	35
Cr	135
Glucose	6.2
Ca	9.5
T bili	10
AST	35
ALT	32
Alk Phos	97

Urine	
LE	Negative
Blood	Negative
Nit	Negative
Culture	pending
Alb/Cr	45
UDS	Negative

Other	
A1c	5.4
Chol	4.8
LDL	3.4
HDL	1.1
Trigs	2.1
TSH	3.1
Alcohol	negative
Blood culture	Pending
HIV	negative

Coags	
PT	15
aPTT	22
INR	1.4

Imaging

Procedures

*indicates the test was likely not indicated with this clinical presentation

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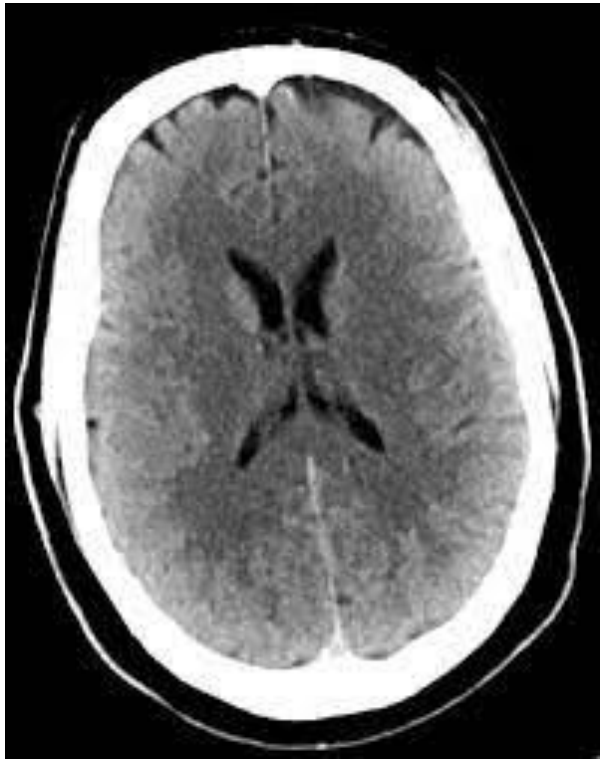
Imaging



*Head CT normal

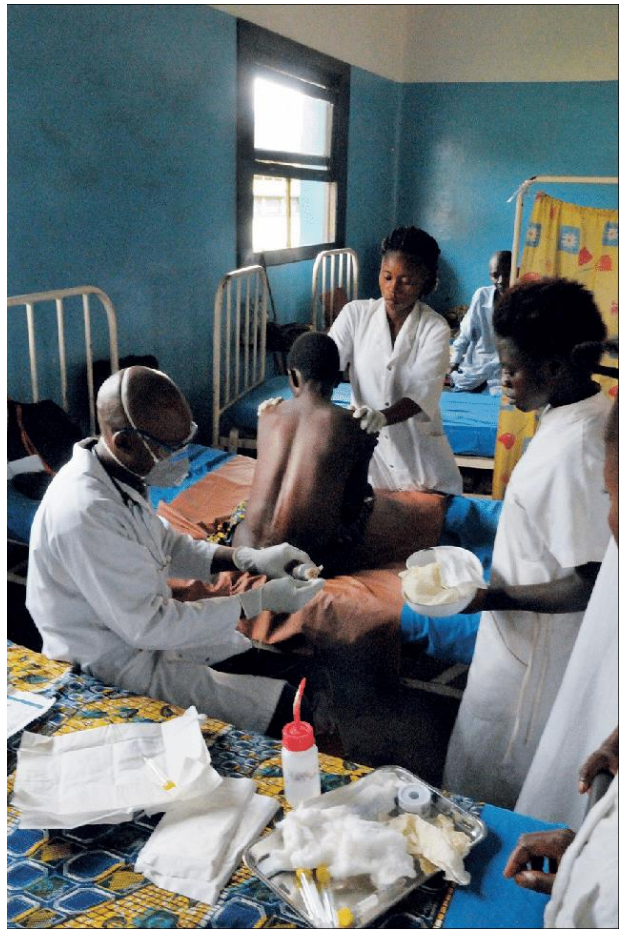
Labs

Procedures

Seed Global Health

Procedures

CSF	
Opening pressure (cmH20)	36
Appearance	turbid
Protein (mg/dL)	62
Glucose (mmol/L)	1.7
Gram stain	Gram(+) cocci
Culture	pending
WCC	583
Diff	90% PMN



Labs Imaging

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Assessment

- Mwamba is a 61yoM with a PMH of HTN, CCF and a-fib who presents with a headache, fever, neck stiffness, N/V and altered mental status making meningitis the most likely diagnosis.

- Differential would include: bacterial/viral/fungal meningitis, HIV, drug induced meningitis, CVA, subarachnoid hemorrhage, CNS vasculitis, intracranial mass, UTI

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Plan

- Will need to start antibiotics as soon as possible to decrease mortality
- Prior to antibiotics will send blood cultures, FBC, coagulation studies and perform an LP as long as the LP does not significantly delay antibiotics
- Will need non-contrast CT to assess risk for herniation prior to LP
- Start empiric antibiotics with ceftriaxone 2mg IV bd plus vancomycin 15-20mg/kg IV q8-12 hours
- Since he is over 50yo will add ampicillin 2g IV q4 hours to cover listeria
- Acyclovir 10mg/kg IV q8 should be administered until HSV has been ruled out
- Can also consider dexamethasone 0.15mg/kg IV q6 before/during antibiotics for 2-4 days for suspected streptococcal meningitis since he is HIV negative

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Bacterial Meningitis Summary

Bacterial meningitis is usually caused by either streptococcal pneumoniae or Neisseria meningitides

- If >50yo Listeria monocytogenes is also an etiology for bacterial meningitis
- Consider Cryptococcal meningitis if HIV positive

Risk factors: older age, immunosuppression, close living quarters, recent neurosurgery

Only 40% present with classic triad is fever, neck stiffness and altered mental status

- Presentation varies based on age, immunosuppression state and partial treatments
- Kernig and Brudzinski are unreliable for diagnosing and ruling out meningitis

Delaying antibiotic administration is associated with increased mortality

- Prior to administering antibiotics draw blood cultures, FBC, coagulation studies, and perform LP
- Empirically treat with ceftriaxone and vancomycin, acyclovir until HSV is ruled out and ampicillin if >50yo
- Dexamethasone if not HIV positive and streptococcal pneumoniae is suspected

Non-contrast CT should be performed to assess herniation risk and is indicated if:

- Immunocompromised, papilledema, history of CNS disease, focal neurologic deficits, new onset seizure ≤ 1 week, abnormal level of consciousness

CSF: high opening pressure, cloudy appearance, elevated cell count and protein, decreased glucose

Complications: septic shock, increased intracranial pressure, SIADH, focal neurologic deficits, hearing loss, cognitive impairment after recovery