Types of Headache: Migraine, Cluster Headache, and More

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Headache is one of the most common symptoms in the emergency department and outpatient clinics. It can be a sign for serious illness that needs immediate action to prevent fatal consequences e.g. subarachnoid hemorrhage, meningitis, and temporal arteritis. Headache also can be a sign of chronic physical and mental illnesses. Careful history taking and physical examination should be performed to any patient complaining of headache for proper diagnosis and management.

Overview

Headaches can be considered a **protective mechanism** in that they are a warning sign of what may be a severe underlying pathology. They can be primary with no pathological predisposition (e.g., **migraine** and **cluster headaches)** or secondary to other disorders (e.g., **sinusitis**, **hypertension emergencies,** or **brain tumors)**.

Evaluation of patients with headache is directed first toward the elimination of serious, life-threatening conditions, followed by diagnosis.

Possible causes of **subacute headaches** include brain tumors, central nervous system (CNS) infections, CNS hemorrhage, hypertension, and systemic inflammatory diseases.

Most **chronic headaches** are usually tension headaches, migraines, cluster headaches, sinusitis, refractive errors, or due to temporomandibular joint dysfunction. **Patient history** is the first diagnostic tool.

For exclusion of danger signs during the evaluation, the mnemonic "**SNOOP**" is used. The presence of any of these manifestations prompts further investigations to uncover the exact pathology.

- **S**ystemic disorders that may be a sign of a new disorder or a progression of a previously diagnosed disorder
- **Neurological** deficits such as altered consciousness level, vision changes, or personality changes, possibly as a result of head trauma
- **O**nset headache (new or sudden) that increases in intensity rapidly
- **O**lder than 50 with a different headache than one previously experienced
- **Prior headache** that has changed in intensity or progressively worsening

"Red Flag" Headaches

Giant Cell Arteritis

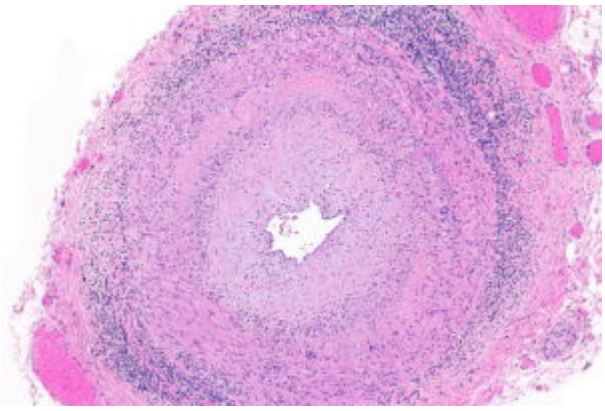

Image: "Micrograph of giant cell arteritis (also temporal arteritis). H&E stain." by Nephron – Own work. License: CC BY-SA 3.0

Giant cell arteritis, also called **temporal arteritis,** is a type of vasculitis affecting large and medium-sized arteries. It occurs in patients who are 50 years old or older. The headache is usually in the temporal or frontal area with tenderness over the temporal muscles. It is important to diagnose temporal arteritis early based on clinical suspicion and initiation of treatment to avoid ocular complications, which may **progress to visual loss**. **Systemic inflammatory symptoms** of fatigue, fever, jaw claudications and

weight loss may also be present.

Hypertensive Emergencies

Elevated blood pressure with end-organ damage can present with headache. Further investigation is required to prevent brain hemorrhage, retinal hemorrhage, renal failure, and pulmonary edema. Sodium nitroprusside will lower blood pressure rapidly in hypertensive emergencies.

Subarachnoid Hemorrhage

Subarachnoid hemorrhage refers to blood in the subarachnoid space due to a **ruptured brain aneurysm** or **arteriovenous malformation**. It can be spontaneous or traumatic, with a severe headache that can be described as the **"worst headache of my life."**

The clinical presentation also includes altered mental status, focal neurological lesions according to the location of hemorrhage, meningeal irritation, and sometimes coma. **CT scan** is the first step for the diagnosis, especially in patients with altered mental status.

Lumbar puncture with CSF analysis can be done following CT to exclude any brain space-occupying lesions. Management of subarachnoid hemorrhage varies according to clinical presentation with ABC for comatose patients. **Lowering the intracranial tension** with **mannitol** and **diuretics** will improve the patient's mental status. Blood pressure control, hydration, supportive measures, and antiepileptic prophylaxis are indicated.

Venous Sinus Thrombosis

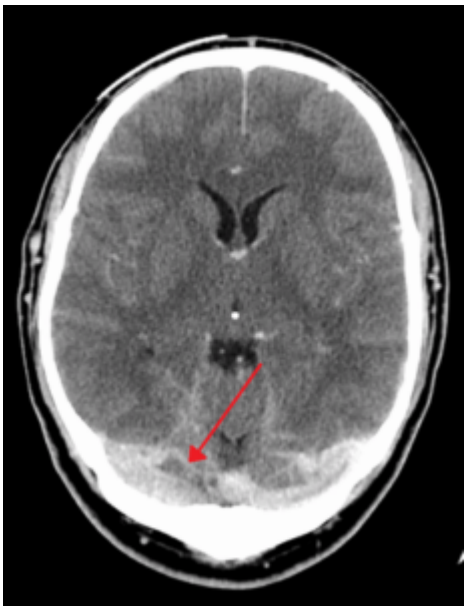

Image: "A dural venous sinus thrombosis of the transverse sinus. Greater on the right than left." by James Heilman, MD – Own work. License: CC BY-SA 4.0

Cerebral sinus thrombosis manifestations can vary according to the sinus affected. It usually presents with **acute onset headache**, **visual abnormalities**, **nausea**, **vomiting,** and **cranial nerve palsies**.

Brain infarction or hemorrhage can both be complications of sinus thrombosis due to **blood congestion**. It can be a complication of **sinusitis**, **hypercoagulable states**, **lumbar puncture**, **brain surgery,** or **medications,** e.g., steroids, oral contraceptives, tamoxifen, and epsilon-aminocaproic acid.

Treatment includes thrombolytic therapy, analgesics, lumbar puncture, and antiepileptics.

Meningitis/Encephalitis

These terms refer to **CNS infection**. While meningitis is inflammation of the brain meninges due to viral, bacterial, or fungal CSF infection, encephalitis is inflammation of the brain itself due to a viral or autoimmune disorder. Clinical manifestations include **fever**, headache, photophobia, nuchal rigidity, and focal neurological symptoms.

Blood cultures, lumbar puncture, and CSF analysis are used for confirming the diagnosis. According to the etiology, the CSF sample differs in glucose content, WBCs infiltration, proteins, and lactate concentration. Treatment is directed against the causative agent.

Bacterial meningitis	Viral meningitis
• Headache is usually diffuse • Fever and meningismus are typical (may be absent in elderly or immunocompromised) • Alteration in the level of consciousness is frequent	• Diffuse headache that often has developed over several days • Associated symptoms of fatigue and myalgias common • Level of consciousness and neurologic exam should be normal

Glaucoma

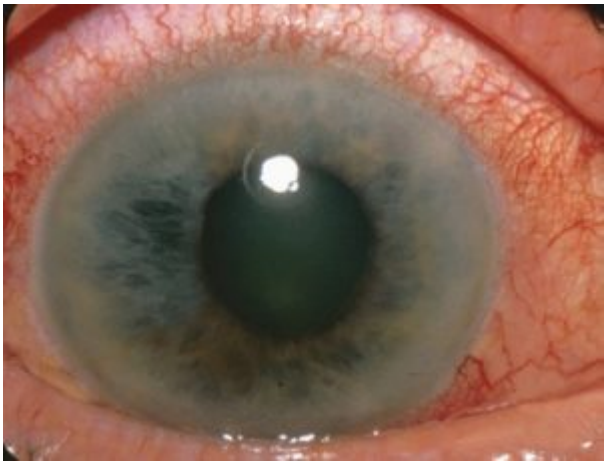

Image: “Photograph showing acute angle-closure glaucoma, which is a sudden elevation in intraocular pressure that occurs when the iris blocks the eye’s drainage channel—the trabecular meshwork.” by Jonathan Trobe, M.D. – The Eyes Have It. License: CC BY 3.0

Glaucoma is a common cause of headache due to **elevated intraocular pressure**. It can lead to **optic atrophy** and subsequent **blindness**. **Acute angle glaucoma** is acute in onset with eye pain, conjunctival injection, nausea, and vomiting. **Acute angle glaucoma is a medical emergency.** Management is directed to the lowering of the intraocular pressure.

Primary Headache

Migraine

Migraines are usually paroxysmal, unilateral, throbbing headaches that can be accompanied by nausea, vomiting, phonophobia, and photophobia. It can be precipitated by many factors, including visual stimuli, environmental factors, wine, stress, sleep disturbances, nitrites, and aspartame.

The pain can be moderate to severe lasting from 4 to 72 hours and localized to one lobe or an area of the head, mainly the frontotemporal or ocular area. It can also be associated with **conjunctival injection**, **cardiovascular manifestations of hyper/hypotension**, **neurological symptoms of Horner syndrome**, **sensory abnormality,** and/or **cranial nerve abnormality**.

Migraine is usually proceeded by an **aura** that might be sensory or motor and usually lasts for less than one hour. **Visual aura of scotoma** is the most common and involves an arc or band of absent vision within the visual field.

Chronic migraine is defined as having 15 or more migraine headaches a month for at least three months.

Diagnosis of migraine is made clinically with no need for imaging studies in patients with typical recurrent attacks. Patients with migraines usually avoid sudden movement, which can precipitate the attacks, unlike patients with cluster headache, which is severe enough to make the patient restless and irritable.

Management is mainly abortive for the acute attacks and prophylaxis for the prevention of future attacks. Acute management includes **triptans**, **ergot alkaloids,** and **NSAIDs**. Preventive management includes beta-blockers, tricyclic antidepressants, antiepileptics, calcium channel blockers, SSRIs, and NSAIDs.

Mild headache	Moderate to severe headache
• NSAID • Acetaminophen	Dopamine agonist or antiemetic medications • Metoclopramide • Prochlorperazine Dihydroergotamine (DHE) • Sumatriptan Parenteral steroids Intravenous fluids Depakote

Tension Headache

A tension-type headache is usually **bilateral headache** with mild to moderate severity and can last between a few minutes to several days. It can be associated with **pericranial muscle spasm** or **tenderness in the neck and scalp**.

The pain starts in the back of the head and neck, then spreads as tightness or pressure band. It is not usually associated with nausea or vomiting and no disability of the affected patients.

Chronic tension headache is diagnosed when the attacks occur for 15 or more days a month for at least three months. It is usually triggered by stressful events, depression, and abnormal head posture. There is no aura or prodrome with tension headache, and the neurological exam should be normal except for some tenderness or spasm of the

neck muscles.

Management of tension headache is mainly to avoid the triggering stressors. Relaxation techniques, cold or hot packs, ultrasound, acupuncture, NSAIDs (ibuprofen, naproxen), and diphenhydramine.

Cluster Headache (Horton's Syndrome)

This is a form of **severe unilateral periorbital headache** in the trigeminal nerve distribution with conjunctival injection, lacrimation, nasal congestion, and rhinorrhea. Sometimes it can be associated with **miosis** and **ptosis**. The pain usually lasts a few minutes to hours.

The attacks are commonly recurrent at the same time every night and awake the patient from sleep. The pain is severe, and the patient is restless and irritable. **Heavy smoking and alcohol use** are risk factors for the development of cluster headache as well as **histamine** and **head trauma**.

Chronic cluster headache occurs when the headache-free interval is less than one month or when it lasts for more than one year. Abortive management of cluster attacks includes **oxygen inhalation therapy**, **triptans** such as sumatriptan, **ergot alkaloids**, **caffeine,** and **installation of local anesthetics** into the nostrils.

Prophylactic management includes calcium channel blockers, such as verapamil & diltiazem, lithium, prednisolone, and antiepileptics.

New Daily Persistent Headache

Primary headache that is unremitting daily for more than three months. It is usually bilateral, mild to moderate headache, tightening in quality, and can be associated with photophobia, phonophobia and mild nausea.

The **etiology is unknown** but most patients report **infection or flu-like illness** and sometimes **stressful life event**. Patients usually remember the exact date it started.

This is a **diagnosis of exclusion**. Various medications have been tried for management of new daily persistent headaches, including propranolol, amitriptyline, gabapentin, and pregabalin.

Hemicranias Continua

Primary unremitting persistent headache that can have severe exacerbations. The pain is unilateral and associated with **miosis**, **ptosis**, **conjunctival injection,** or **rhinorrhea**. It responds well to **indomethacin**.

Idiopathic/Benign Intracranial Hypertension

Also called **pseudotumor cerebri**, this is a known cause of chronic headache characterized by symptoms of increased intracranial tension, including headache, vision loss, nausea, vomiting, and papilledema with no evidence of a space-occupying lesion in neuroimaging.

The symptoms can also include **pulsatile tinnitus** and abducens nerve and other neurological deficits. The symptoms are relieved after a lumbar puncture to relieve the pressure, or medications which lower CSF pressure.

The disease is common in **women of childbearing age**. Lumbar puncture should be proceeded with MRI to avoid brain stem herniation in case of a space-occupying lesion.

Elevated CSF opening pressure with normal CSF composition is both diagnostic and therapeutic. Carbonic anhydrase inhibitors, acetazolamide is used effectively to lower CSF production.

Headache with increased intracranial tension can also be present with space-occupying lesions, including tumors, CNS abscess, or hemorrhage.

Miscellaneous

Pheochromocytoma is characterized by intermittent hypertension with headaches, palpitations, and sweating. It is due to **hypersecretion of the adrenal medulla**.

Image: “Subarachnoid hemorrhage in CT. One can see the blood hyperattenuating in the basal cisterns.” by Hellerhoff. License: CC BY-SA 3.0

Morning headache is usually due to **sleep disturbances** and **obstructive sleep apnea**.

Thunderclap headache refers to a severe form of headache that arises suddenly. It can be due to subarachnoid hemorrhage, stroke, cervical artery dissection, pituitary apoplexy, or a hypertensive crisis.

Chronic subdural hemorrhage is chronic hemorrhage localized within the subdural space especially in old age due to **brain atrophy** and **minor head trauma**. The blood accumulates over a long period with symptoms of headache, cognitive disability and focal neurological abnormality. Treatment is usually surgical evacuation of the hematoma.

Acute and chronic sinusitis can be associated with a headache which mimics migraine or tension headache. Other sinus symptoms include fever, nasal congestion, and rhinorrhea. The headache is usually **pressure-lik**e and **periorbital** and lacks other manifestations of migraine or tension headache. Treatment involves decongestants, antibiotics, and analgesics.

Medication overuse headache is a chronic headache with repeated analgesic use,

which may lead to rebound headaches.

Cranial neuralgias include herpetic neuralgia and trigeminal neuralgia, which are stabbing sharp pains at the nerve distribution. Medical management with gabapentin or pregabalin and surgical management can be done to decompress the nerve origin to prevent the attacks.

Diagnostic Tests

- **Blood draws,** e.g. CRP, CBC, and ESR are first indicated to exclude systemic inflammatory conditions, which might precipitate the headache
- **Brain imaging** using CT and MRI for brain tumors or lesions, hemorrhage, stroke, trauma, and benign intracranial hypertension
- **Lumbar puncture** and **CSF analysis** in case of infection, subarachnoid hemorrhage, and benign intracranial hemorrhage
- **Fundal examination** for cases of headaches due to brain tumor, hypertension, benign intracranial hypertension glaucoma, and HIV

References

Overview of chronic daily headache via uptodate.com

Evaluation of the adult with headache in the emergency department via uptodate.com

medscape.com

Headache via webmd.com

Notes