Posterior Circulation Stroke
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Objectives

- Recognize presenting symptoms of posterior circulation stroke
- Dizzy plus
- Identify anatomy associated with posterior circulation stroke
- Identify a few syndromes associated with posterior circulation stroke

Presenting Symptoms

B.E. F.A.S.T.

Most common presenting symptoms of posterior circulation ischemia

- **Dizziness** (47%)
- Unilateral limb weakness (41%)
- Dysarthria (31%)
- Headache (28%)
- Nausea and Vomiting (27%)

According to the New England Medical Center Posterior Circulation Registry

- **Dizziness** (47%)
- Unilateral limb weakness (41%)
- Dysarthria (31%)
- Headache (28%)
- Nausea and Vomiting (27%)

Most common signs of posterior circulation ischemia

- Unilateral limb weakness (38%)
- Gait ataxia (31%)
- Unilateral limb ataxia (30%)
- Dysarthria (28%)
- Nystagmus (24%)

Vertigo

- Sensation of feeling off balance
- Often caused by inner ear problem
  - Benign paroxysmal positional vertigo (BPPV)
  - Tiny calcium particles clump in inner ear canals
- Meniere's Disease
  - Caused by fluid buildup and changing pressure
  - Vertigo often accompanies tinnitus and hearing loss
- Vestibular Neuritis
  - Inner ear infection (usually viral)

Vertigo often accompanies tinnitus and hearing loss.

Dizzy plus

- Primary presentation is often “I'm dizzy”
- Ask probing questions to determine if the patient has any other symptoms
- 5 D’s of posterior stroke
  - Dizziness
  - Diplopia
  - Dysarthria
  - Dysphagia
  - Dystaxia
- May also have motor/sensory deficits which mimic anterior circulation

Peripheral vs Central

- Head impulse testing
- Nystagmus
- Test of Skew
- 100% sensitivity, 96% specificity
- https://www.youtube.com/watch?v=1q-VTKPweuk

Vertebrobasilar Arterial System

- Upper
  - Posterior Cerebral Artery
  - Superior Cerebellar Artery
- Middle
  - Basilar Artery
  - Anterior Inferior Cerebellar Artery
- Lower
  - Vertebral Artery
  - Posterior Inferior Cerebellar Artery

Areas of the brain affected by occlusion in the vertebrobasilar arterial system

Common etiology of posterior circulation stroke

- Cardioembolic
- Artherosclerosis
- Dissection (traumatic or spontaneous)
- Less common
  - Migraine
  - Hypercoagulable disorders
  - Drug abuse
  - Vasculitis
  - Fibromuscular dysplasia

A Few Syndromes That May Occur Due to Posterior Circulation Stroke

Locked-In Syndrome

- Symptoms: complete paralysis, inability to speak, no facial movements, dysphagia, unresponsive to painful stimuli
- Able to hear and see, normal intelligence, may only communicate with eye movement
- Primary case is a brainstem hemorrhagic or ischemic stroke
- Supportive cares include: breathing support, alternative nutrition, VTE prophylaxis, pressure injury prevention, speech therapy
- [https://www.youtube.com/watch?v=A3uEMyVnTH](https://www.youtube.com/watch?v=A3uEMyVnTH)

Wallenberg Syndrome

- Symptoms: hoarseness, n/v, hiccups, nystagmus, inability or decrease in ability to sweat, body temperature sensation issues, dizziness, ataxia, balance difficulties, swallowing difficulties
- Caused by a stroke in the lateral medulla
- Supportive care: speech therapy, antiemetics, physical therapy, occupational therapy, tube feedings

Anton-Babinski Syndrome
- Symptoms: cortical blindness but unaware, confabulation
- Primary cause: bilateral infarction of the posterior cerebral artery
- Supportive cares: occupational therapy, physical therapy, audio books, 24 hours assistance


“Top of the Basilar” Syndrome
- Symptoms: hallucinations and behavioral changes, alternating abnormalities of alertness, disorientation, visual, oculomotor deficits and cortical blindness
- Primary cause: thromboembolic occlusions of the distal third or tip of the basilar artery
- Often missed due to patient confusion and unawareness of visual deficits


Balints Syndrome
- Symptoms: oculomotor apraxia, optic ataxia, visual simultagnosia
- Primary cause: stroke affecting both parietal lobes
- Supportive cares: occupational therapy, audio books, 24 hour care
  - https://www.dailymotion.com/video/x2wdjoj
  - https://emedicine.medscape.com/article/2128100-overview#a4

A few case studies

Julie 68 year old female
- “When I got up from my nap, I couldn’t find the door”
- Became more confused over the next two days
- Couldn’t dial the phone
- Couldn’t find the cabinets
- Daughter became concerned when she didn’t hear from her mom
- Made appointment with ophthalmologist, vision test was 20/30 without glasses and 20/20 with glasses
  - Ophthalmologist referred to neurologist
Craig 59 year old Male

- Presents with complaints of weakness over 2 hours
- Also complains of hoarseness and blurry vision
- Medication change one week ago
- Recently had a cold, but felt he was “over it”
- Returned from a business trip previous night
- ED assessment positive for dysarthria

Susan 78 year old Female

- Found by her husband to be unresponsive after a nap
- CT scan was negative for any acute findings, old infarct noted
- Patient was on opioid medications for long-standing back pain
- Admitted to ICU with GCS of 4
- Periods of hypersomnia and unresponsiveness alternating with agitation and delirium

George 90 year old Male

- Son brought patient to see primary care physician after realizing something was not right with his dad
- MD assessment reveals bilateral blindness, anosognosia, and vivid visual confabulation
- Symptoms are reported to have been present for 3 days
In Conclusion

- Posterior circulation strokes count for approximately 20% of strokes
- Asking probing questions are key to differentiating vertigo and posterior circulation stroke
- HINTS exam is helpful in assessing potential posterior circulation stroke, but is not commonly done in the ED or acute hospitalization
- Posterior circulation stroke is associated with some interesting syndromes
- IV thrombolytic therapy may be appropriate if eligible

References