A Stroke or Not a Stroke: That is the Question

Stephen J. Vetrano DO, FACOEP, FACEP, EMT(I)
About me

• Jersey Born, Jersey Raised, Jersey Educated

• Attending ED Physician

• EMS Medical Director

• State EMS Medical Medical Advisor
Disclosures

NONE!
Stroke should be suspected in any patient with abrupt onset of neurological symptoms

1. True
2. False
Question 1 Answer

• True

• Key finding in atypical strokes is that the onset is acute
Who’s out there?

• Obvious strokes

• Bell’s Palsy

• Stroke mimics (hypoglycemia, Todd’s paralysis)

• Atypical strokes
Why atypical?

- Non-vascular cause
- Early presentation
- Variation in neurovascular anatomy
- Stroke size
- Pt age (younger)
- Posterior circulation symptoms
- Non-lateralizing symptoms
What we work with

• NIH Stroke Scale

• Cincinatti PreHospital Stroke Scale
  – Facial droop, slurred speech, arm drift

• Los Angeles Prehospital Stroke Scale
  – Age >45, seizure history absent, symptoms<24, not wheelchair/bedridden at baseline, blood glucose between 60 and 400, asymmetry in any of 3 exam categories:
    • Facial smile, grip, arm strength
Non-localizing symptoms

- Neuropsychiatric behaviors
  - Often involve frontal lobes
- Acute confusional state/delirium
  - Corpus Callosum stroke
- Altered Level of Consciousness
  - Large classic stroke
  - Bilateral thalamic/midbrain/posterior circulation stroke
Movement disorders

- Often associated with basal ganglia strokes
- Can be mistaken for partial seizures
- Variety of symptoms
  - Chorea, dystonia, myoclonus, asterixis, tremors
What about seizure?

- Not uncommon—upwards of 7%
- More common in younger patients and hemorrhagic stroke
- Also high in sinus thrombosis with venous infarcts
- Todd’s paralysis difficult to exclude
Stroke is a CNS event, therefore all symptoms relate to a CNS cause

1. True
2. False
Question 2 Answer

• False

• Dizziness/Vertigo/Nausea/Vomiting
Peripheral Nervous System symptoms

- Most common is acute vestibular syndrome
- Most common cause of AVS is vestibular neuritis (peripheral cause)
- Yet as low as 10%, as high as 75%, with AVS have a posterior circulation stroke (vertebrobasilar disease)
As a result...

- Vertebrobasilar infarcts are more commonly misdiagnosed
- Symptoms more easily dismissed
- Can be seen in younger patients
- Neurological exam is deceptively benign
  - NIHSS can be 0

Poor outcomes can result
We’ve seen motor symptoms dominate...

• Can sensory symptoms dominate?
• Rare, often subtle motor symptoms present
• Often with abnormal sensation in more than one body region
• Can be sensory loss or paresthesias
Movement, sensory, peripheral, psychiatric...What’s left?
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Everything else!
Purely atypical symptoms

- **Dysarthria**
  - Often seen with other symptoms
  - Can be isolated

- **Visual symptoms**
  - Various symptomatology
    - Blindness, apraxia, ocular ataxia, hemi or quadrantopia
Dysphagia

- Often the only presenting sign of a medullary or brainstem stroke
- Onset is sudden
- Some AVS symptoms may be present
Lateral Medullary Syndrome

• Wallenberg’s Syndrome

• Dysphonia, dyspnea and even stridor
  – Paralysis of larynx/pharynx

• Tongue deviation often present-points to the lesion

• Contralateral body sensory impairment, ipsilateral facial impairment

• Horner’s syndrome-ptosis, miosis, anhydrosis
Here’s an interesting presentation..

• Foreign accent syndrome
  – Change in speech resulting in altered phonetics
  – Speech is usually clear
  – Assumption is that the patient speaks a different language
  – Often frontoparietal areas and/or subcortical basal ganglion
Isolated Headache

- Often occurs with hemorrhagic and ischemic stroke presentation.
- Can be isolated symptom or with non-specific symptoms.
- In ischemic stroke, HA more common in cerebellar infarction.
Why does this matter?

• Reason number 1: neuroimaging results

• Often are negative

• Requires MR, CT-Angiogram, LP
OP-15
OP-15

ED use of Brain CT in Atraumatic Headache
• Significant debate in the literature.

• One study states OP-15 is not evidence based.
So What’s the Answer?

• We know what is stroke: lateralizing deficits/speech deficits
  – Picked up on stroke scales
So What’s the Answer?

• We know what is stroke: lateralizing deficits/speech deficits
  – Picked up on stroke scales

• We’ve seen what can be stroke
  – Not picked up on stroke scales
Making the diagnosis

• High index of suspicion

• Key feature: abrupt onset

• Non-contrast head CT has limitations
  – Particularly early on in stroke
Positive vs. negative

• Helpful to look at stroke in this way:

• Classic stroke has negative symptoms
  – Sensory or motor loss

• Rare varieties are positive symptoms
  – Seizure, headache, visual disturbance, psychiatric
We’ve talked about suspecting stroke in abrupt onset of symptoms, high index of suspicion in atypical symptoms, and the limitations of imaging. What other key concept is useful in diagnosing stroke?

1. Performing a mini mental status exam
2. Performing a Denver assessment
3. Performing a complete neurologic exam
4. All of the above
The exam

• Stroke scales are good...but are they complete?
• CNs?
• Mental Status and speech?
• Motor strength, movement and tone?
• Gait?
• Sensation?
• Reflexes?
Conclusion

• Stroke has abrupt onset

• Varied presentations-lateralizing deficits prevail

• When they don’t-dig further than the scales

• Look deeper than the Non-Contrast Head CT
Thank you!

Questions?

sjvdo@hotmail.com
Sources

- https://www.google.com/search?q=circle+of+willis+picture&rlz=1C1SFXN
  _enUS500US501&espv=210&es_sm=93&tbm=isch&imgil=S6ipG6MM71O
  v7M%253A%253Bhttps%253A%252F%252Fencrypted-tbn1.gstatic.com%252Fimages%253Fq%253Df%253Dtb%253AANd9GcRoY7ea7sA2iBLLZ9lWXuZiddEQAoM3WwiwnUEW1nNbfTb%25253A%25253Bhttps%25253A%25252F%25252Fwww.cchw.org%25252Fdisplay%25252FPPF%25252FDocID%25252F48513%25252FNav%25252F1%25252Frouter.asp&source=iu&usg=___H6CntC1Uqfg7syVmpXIW5PgLHc%3Dsa=X&ei=qfivUr-kAvDksATu04CQCA&ved=0CCsQ9QEwAQ&biw=1280&bih=665#facrc=
  &imgdi= &imgrc=S6ipG6MM71Ov7M%253A%253BkopjGARYOUXNjM%3Bhttp
  %253A%252F%252Fwww.chw.org%252Fdisplay%252FdisplayFile.asp%252
  53Ffilename%25253D%25252FGroups%25252FDer%25252Fcircle_of_willis_diagram.jpg%3Bhttp%253A%252F%252Fwww.chw.org%252Fdisplay%252FPPF%252FDocID%252F48513%252FNav%252F1%252Frouter.asp%3B1500%3
  B1500
Sources

- https://www.google.com/search?q=circle+of+willis+picture&rlz=1C1SFXN_enUS500US501&espv=210&es_sm=93&tbm=isch&imgil=S6igpG6MM71Ov7M%253A%253Bhttps%253A%252F%252Fencrypted-tbn1.gstatic.com%252Fimages%253Fq%253Dhttps%253A%252F%252Fwww.chw.org%252Fdisplay%252FDocID%252F48513%252FNav%252F%252Frouter.asp&source=iu&usg=__H6CntC1Uqfg7syVmpXlW5PgX1Hc%3D&sa=X&ei=qfjvUr-kAvDksATu04CQCA&ved=0CCsQ9QEwAQ&biw=1280&bih=665#facrc=_&imgdii=_&imgrc=81YDHeTw2FzN5M%253A%253Bhttp%253A%252F%252Fthumbs.dreamstime.com%252Fx%252Fcircle-willis-12609711.jpg%3Bhttp%253A%252F%252Fwww.dreamstime.com%252Fstock-image-circle-willis-image12609711%3B400%3B317
Sources

• http://www.ninds.nih.gov/doctors/NIH_Stroke_Scale.pdf

• Pollak, AN: Nancy Caroline’s Emergency Care in the Streets, 7th ed. 2013: Jones and Bartlett Learning, Burlington MA

Sources