RASY 401 Case Presentation

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Ed. John Lilly, MD
75 y/o woman presents to the ED April 9

Triage Note (8:22PM)
Patient stated having slurred speech about 1400 (2:00PM) yesterday, patient reports rt chronic arm weakness

PMH
• Allergies (Rhinitis & Sinusitis)
• Bronchitis
• Lt Sided facial Palsy
• Never smoked
• Never consumed EtOH
• Rt. Sided ear pain 12/20/2016
• ENT Surgery (unsure of details)

Medications
• Azithromycin
• Hydrocodone-Chlorpheniramine
• Montelukast
• Neomycin-polymyxin-dexamethasone

Physical Exam

What are the next diagnostic steps?
Next Dx Step?

- ACR Appropriateness Criteria: acsearch.acr.org
- Most appropriate study: Non-contrast CT Head
Next Dx Step: Noncontrast Head CT

Non-contrast head CT (NCCT) is the study of choice because it will effectively rule out hemorrhage.

- Intracranial hemorrhage (ICH) is an absolute contraindication to tPA administration, the cornerstone of ischemic stroke treatment.
- Head CT may also demonstrate the ischemic stroke, but it is important to note that early strokes may have no visible findings.
- Contrast solution can mask the findings of intracranial hemorrhage. Inability to reliably rule out ICH can create the difficult dilemma of treating with tPA in the presence of possible ICH or missing the window to treat possible ischemic stroke. This can be avoided by ordering a NCCT first.

To demonstrate a stroke, contrast-enhanced head CT or MRI are the best choices. It may not be necessary to acutely demonstrate a stroke, and these should generally only be considered after NCCT has been performed.

To demonstrate other structural changes, MRI is excellent for visualizing brain parenchyma.
Differential Diagnosis  
Symptoms: dysarthria, facial weakness, limb weakness

- Cerebral Vascular Accident (CVA)
- Right Sided Bell’s Palsy
- Myositis
- Malnutrition
- Multiple Sclerosis
- Stroke
- Ulcers
- Drugs (hypokalemia)
- ALS
- Diabetic Lumbar Plexopathy
- Myasthenia Gravis
- Botulism
- Pseudobulbar palsy
- Bell’s Palsy
- Thoracic Outlet Syndrome
- CN V/XII Trauma
- Cerebral Vascular Accident
- Right Sided Bell’s Palsy
General Workup

Remember:
Time is Tissue for cerebrovascular accidents!

Recent, sudden onset of persistent focal neurologic deficit

Check for stroke mimics (e.g., hypoglycemia, recent seizure, migraine headache) and determine eligibility for tissue plasminogen activator therapy

Stroke mimic identified
Stoke mimics excluded

Treat and reevaluate
Perform neuroimaging (noncontrast head computed tomography or brain magnetic resonance imaging)

Intracranial mass or hemorrhage identified

Intracerebral hemorrhage excluded; ischemic stroke is not identified, but history and physical examination are consistent with acute ischemic stroke

Acute ischemic stroke identified
Normal, but history and physical examination are suspicious for subarachnoid hemorrhage

Treat as indicated
Give tissue plasminogen activator if no contraindications are present

Perform lumbar puncture
Door-to-needle time, as defined by the American Heart Association, is the time from initial stroke symptom presentation to tPA administration.

- 60 minutes
- Includes transport, intake/ H&P, NCCT, blood glucose, ruling out mimickers, ordering tPA, delivering the drug to the patient’s room, establishing IV access, and administering tPA.
List of Patient Imaging Studies

- CT w/o contrast
- MRI Head w/o contrast
- MRA Head w/o contrast
- CTA Neck w/o contrast

Non-contrast T1 MRI
Sagittal

Non-contrast MRI DWI
Transverse
Noncontrast axial MRI diffusion weighted imaging (DWI)

Left posterior limb of the internal capsule acute infarct
No hemodynamically significant stenosis or aneurysm

(Grey matter is lighter, white matter is darker
T2 Diffusion weighted - Restricted diffusion shows up bright in infarction, abscess, lymphoma, edema)
MRI

Noncontrast axial T1

There is a right internal auditory canal vestibular schwannoma 1.5 x 0.7 cm
At time of presentation, patient did not qualify for tPA (symptoms > 6 hours)\textsuperscript{10}.

MRI Diagnoses made: small nonhemorrhagic infarct on left and vestibular schwannoma on right.

CTA Neck: unremarkable.

Treatment:
- Amlodipine
- Atorvastatin
- Aspirin

Discharged in stable condition.

Post phone call:
- Set-up appt with Neurology for evaluation
- ENT consult
  - Consider removal of schwannoma to relieve symptoms
  - Follow-up planning if surgery is not warranted
The overall sensitivity of MRI to diagnose Acoustic Schwannoma were found, Sensitivity 96%, Specificity 88.2%, PPV 92.31%, NPV 93.75% and Accuracy 92.86%. Test is significant with p < 0.0001 level.

Regarding internal auditory canal tumors, the sensitivity of contrast-enhanced CT was 36% and MRI 100%, and for cerebellopontine angle tumors the sensitivity was 68% and 100%, respectively.

“Ice cream on cone” appearance

Coronal enhanced T1 MRI

Axial enhanced T1 MRI
Imaging discussion: MRI Stroke

- Diffusion weighted MRI proved to have a sensitivity of 94.4% and a specificity of 92.1%\textsuperscript{5}
Cost of Patient Imaging Studies

- MRI Head w/o contrast: $3919
- MRA Head w/o contrast: $2963
- CTA Neck w/o contrast $3420, 16 msV (5.0 – 32)
- Total: ~$10500

Prices base on nondiscounted University of Michigan prices.
Radiation dose based on Harvard Health Publishing\textsuperscript{6,9}.