



Stroke Case Study-2021

Alteplase or Not?

Jerilyn Alexander, RN Stroke
Coordinator

FINANCIAL DISCLOSURE:

No relevant financial relationship exists

Patient Background

- **36 yo male** presents to Critical Access hospital with “right side weakness, facial droop and dysphagia”
- LKW 1157
- Past medical history: HTN, HLD, Depression, Family history of stroke, and former smoker
- Current meds: Venlafaxine, Crestor
- Arrival at 1340
- Stroke Alert activated at 1340
- CT started at 1344 (4 minutes) Reported to physician at 1410 as no hemorrhage noted



IMPRESSION:

1. There is no intracranial hemorrhage.
2. There is high density in the left middle cerebral artery suspicious for an acute thrombus in the left middle cerebral artery. A stroke is not visible in the left cerebral hemisphere and an early stroke may not be visible on the CT imaging. Correlate clinically for a stroke and CTA or MRA of the head with diffusion may provide additional imaging evaluation.

CT Head-
CAH
Scout
image at
1344
Reported
at 1410

NIHSS-Baseline

- 1a. Level of Consciousness -1
- 1b. LOC Questions -2
- 1c. LOC Commands -2
- 2. Best Gaze -2
- 3. Visual -1
- 4. Facial Palsy -2
- 5a. Left Motor Arm -1
- 5b. Right Motor Arm -4
- 6a. Left Motor Leg -2
- 6b. Right Motor Leg -4
- 7. Limb Ataxia -1
- 8. Sensory -1
- 9. Best Language -3
- 10. Dysarthria -2
- 11. Extinction and Inattention -1

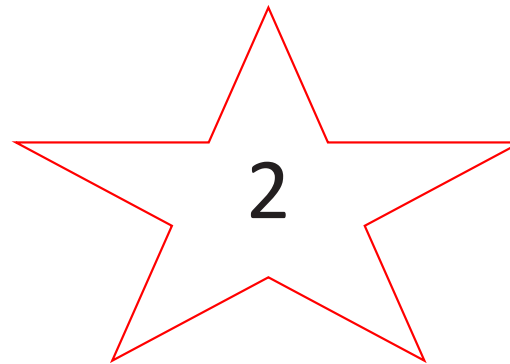


CAH Information

- VS: 162/119 HR 93 99% Room Air
- Lab drawn 1350
- Bedside Glucose 115 at 1352
- Failed Swallow eval
- Abnormal Labs-None
- No alteplase due to rapidly improving symptoms/resolution

NIHSS-1405

- 1a. Level of Consciousness -0
- 1b. LOC Questions -0
- 1c. LOC Commands -0
- 2. Best Gaze -0
- 3. Visual -0
- 4. Facial Palsy -0
- 5a. Left Motor Arm -0
- 5b. Right Motor Arm -0
- 6a. Left Motor Leg -0
- 6b. Right Motor Leg -0
- 7. Limb Ataxia -0
- 8. Sensory -0
- 9. Best Language -1
- 10. Dysarthria -1
- 11. Extinction and Inattention -0



Alteplase or Not?

INCLUSION CRITERIA - Patient who should receive IV Thrombolytic

- ☐ Symptoms suggestive of ischemic stroke that are deemed to be disabling*, regardless of improvement (see Reference Table below for considered disabling symptoms)
- ☐ Able to initiate treatment within 4.5 hours of Time Last Known Well (document clock time)
- ☐ Age 18 years or older
- ☐ WAKE-UP or unknown time of onset Acute Ischemic Stroke (If MRI Available)-IV alteplase administered within 4.5 hour of stroke symptom recognition can be beneficial in patients with AIS who awake with stroke symptoms or have unknown time of onset >4.5 hour from last known well or at baseline state and who have a DW-MRI lesion smaller than one-third of MCA territory and no visible signal change on FLAIR. (COR IIa; LOE B-R)

*Considered disabling symptoms: should be considered for IV Thrombolytic treatment

Complete hemianopsia (* 2 on NIHSS question 3) or severe aphasia (* 2 on NIHSS question 9), or
Visual or sensory extinction (* 1 on NIHSS question 11) or
Any weakness limiting sustained effort against gravity (* 2 on NIHSS question 6 or 7) or
Any deficits that lead to a total NIHSS score >5 or
Any remaining symptoms considered potentially disabling in the view of the patient and the treating practitioner. i.e., Do presenting symptoms interfere with lifestyle (work, hobbies, entertainment?) Clinical judgment is required**

**Note: This is an example based on current best practices for hospitals to implement and operationalize. Specific criteria may vary by hospital.

Alteplase or Not

ABSOLUTE EXCLUSION CRITERIA - If patient has any of these, do NOT initiate IV Thrombolytic

- ☐ CT scan demonstrating intracranial hemorrhage or subarachnoid hemorrhage
- ☐ CT exhibits extensive regions (> 1/3 MCA Territory on CT) of clear hypo attenuation
- ☐ Unable to maintain BP <185/110 despite aggressive antihypertensive treatment
- ☐ Ischemic stroke within last 3 months
- ☐ History of intracranial hemorrhage
- ☐ Severe head trauma within last 3 months
- ☐ Active internal bleeding (i.e., Aortic Dissection known or suspected)
- ☐ Arterial puncture at non-compressible site within last 7 days
- ☐ Infective endocarditis
- ☐ Gastrointestinal bleeding within last 21 days or structural GI malignancy
- ☐ Intracranial or spinal surgery within last 3 months

Laboratory:

- ☐ Blood glucose <50 mg/dL (however should treat if stroke symptoms persist after glucose normalized)

Results not required before treatment unless patient is on anticoagulant therapy or there is another reason to suspect an abnormality:

- ☐ INR >1.7
- ☐ Platelet count <100,000, PT >15 sec, aPTT >40 sec

Medications:

- ☐ **Full dose low molecular weight heparin (LMWH) within last 24 hours (patients on prophylactic dose of LMWH should NOT be excluded)
- ☐ Received direct oral anticoagulant (DOAC) within last 48 hours (assuming normal renal metabolizing function)
 - Commonly prescribed DOACs: apixaban (Eliquis), dabigatran (Pradaxa), rivaroxaban (Xarelto), edoxaban (Savaysa)

Alteplase or Not

CONSIDERATION for EXCLUSION (RELATIVE) - Seek Neurology consultation from a Stroke Expert

- ☐ Stroke severity too mild (non-disabling)
- ☐ IV or IA thrombolysis/thrombectomy at an outside hospital prior to arrival
- ☐ Life expectancy < 1 year or severe co-morbid illness or comfort measure only (CMO) on admission
- ☐ Patient/family refusal
- ☐ Pregnancy
- ☐ Major surgery or major trauma within 14 days
- ☐ Seizure at onset and postictal impairment without evidence of stroke
- ☐ Myocardial infarction within last 3 months
- ☐ Acute pericarditis
- ☐ Lumbar puncture within 7 days
- ☐ Past gastrointestinal or genitourinary bleeding
- ☐ Any other condition or history of bleeding diathesis which would pose significant bleeding risk to patient. Conditions may include acute pericarditis, SBE (spontaneous bacterial endocarditis), hemostatic defects, diabetic hemorrhagic retinopathy, septic thrombophlebitis, occluded AV cannula, or patient is currently receiving oral anticoagulants (e.g., Warfarin or DOACS).
- ☐ Presence of known intracranial conditions that may increase risk of bleeding (arteriovenous malformation, aneurysms >10mm, intracranial neoplasm, amyloid angiopathy)
- ☐ High likelihood of left heart thrombus (e.g., mitral stenosis with atrial fibrillation)
- ☐ Blood glucose > 400 mg/dL (however should treat with IV alteplase if stroke symptoms persist after glucose normalized)

2019 Update to the 2018 Stroke Guidelines

- Documentation in the chart is that the patient is not a candidate for alteplase due to rapid improvement of symptoms.

Early improvement

IV alteplase treatment is reasonable for patients who present with moderate to severe ischemic stroke and demonstrate early improvement but remain moderately impaired and potentially disabled in the judgment of the examiner.† (COR IIa; LOE A)

Further information

1320-CAH MD spoke to Neurology told the symptoms had completed resolved-Clock restarted

Northstar Criticair dispatched at 1356

Aspirin 324 mg at 1410

Enroute 1415

On scene 1439

Flight Service at patient 1447 Assessment patient A &O X 3. Having slight difficulty finding words. Anxious for flight Ativan given.

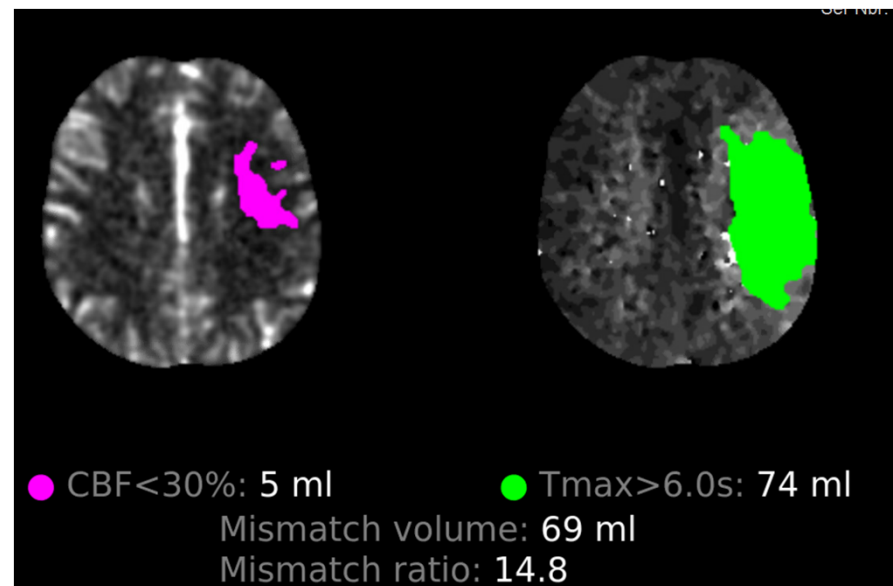
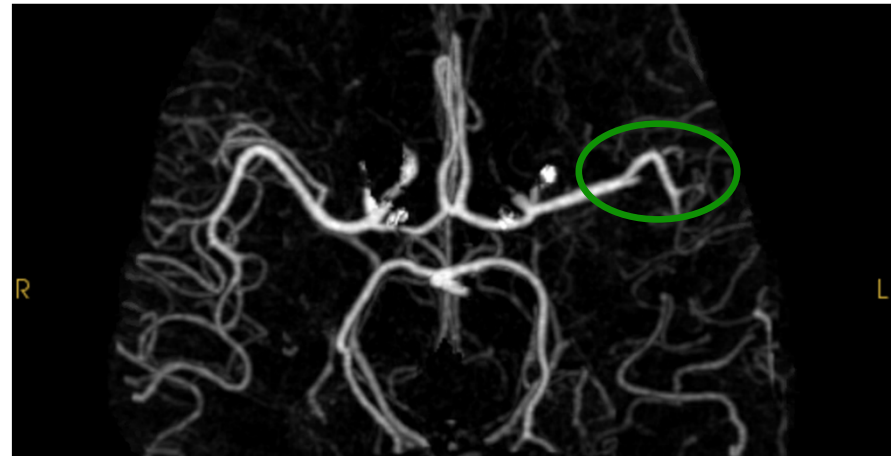
Depart Scene 1508

Arrive Trinity 1539

Straight to CT upon arrival for CTA Perfusion scan

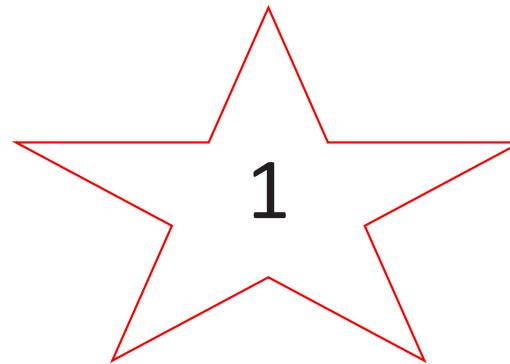
CTA/Perfusion Head/Neck

- M2 Occlusion to Left MCA.
- Left parietal lobe infarct
- Core infarct 5 ml, ischemic tissue 74 ml, mismatch 69
- Left internal carotid artery occluded-possible dissection



NIHSS-1539 (Arrival at Trinity)

- 1a. Level of Consciousness -0
- 1b. LOC Questions -0
- 1c. LOC Commands -0
- 2. Best Gaze -0
- 3. Visual -0
- 4. Facial Palsy -0
- 5a. Left Motor Arm -0
- 5b. Right Motor Arm -0
- 6a. Left Motor Leg -0
- 6b. Right Motor Leg -0
- 7. Limb Ataxia -0
- 8. Sensory -0
- 9. Best Language -1
- 10. Dysarthria -0
- 11. Extinction and Inattention -0



ED Treatment

- Initial assessment shows aphasia-significant word finding difficulties
- Intermittent right side weakness
- NIHSS 1
- Due to waxing and waning symptoms, and the M2 occlusion, it was decided to give alteplase with the plan for endovascular therapy
- Alteplase was given at 1630
- Interventional Radiologist notified of endovascular therapy
- Consent obtained
- To IR at 1646

NIHSS-1630 Pre Alteplase/Intervention

- 1a. Level of Consciousness -0
- 1b. LOC Questions -0
- 1c. LOC Commands -0
- 2. Best Gaze -0
- 3. Visual -0
- 4. Facial Palsy -0
- 5a. Left Motor Arm -0
- 5b. Right Motor Arm -2
- 6a. Left Motor Leg -0
- 6b. Right Motor Leg -2
- 7. Limb Ataxia -0
- 8. Sensory -1
- 9. Best Language -1
- 10. Dysarthria -1
- 11. Extinction and Inattention -0



Stroke Intervention

Carotid Occlusion



Carotid Dissection noted during procedure

Multiple attempts were made to cross the dissection flap

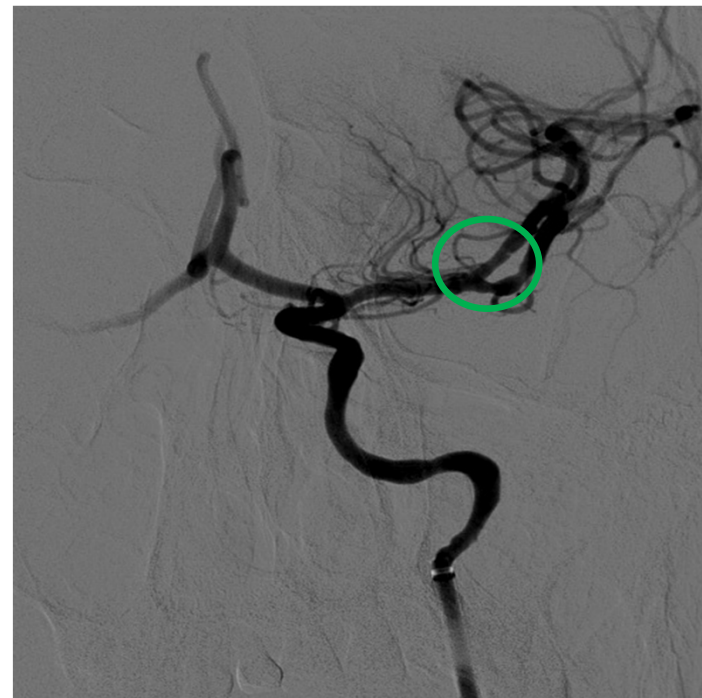
Eventually this was crossed to access the MCA

Stroke Thrombectomy

Pre intervention



Post intervention



Post Procedure Care

- Vessel completely reperfused with TICI-3, no embolization to new territory
- Patient had persistent complete occlusion to the left cervical carotid artery with dissection flap noted. There was residual thrombus surrounding the dissection flap.
- Since the patient received IV alteplase it was decided not to attempt to stent the carotid artery given the risk of intracranial hemorrhage, distal embolization, and possibility of dissection extending into the petrous ICA.
- Patient admitted to the ICU for close monitoring post intervention.
- NIHSS post intervention 0.
- Head CT 24 hours post intervention did now show any hemorrhagic conversion of stroke.

Post Procedure Care

- Since the patient had no hemorrhage on CT, it was decided to start on anticoagulation
- Heparin drip started with plans to bridge to Coumadin.
- Further investigation of the cause of the stroke was completed.
- It was felt his stroke was a post Covid-19 complication as there has been some literature discussing dissection of arteries post Covid-19 infection.
- Vaccination was encouraged and patient was discharged on routine secondary prevention medications as well as Coumadin.



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