STROKE SYNDROME PRESENTATIONS: FROM SIMPLE TO COMPLEX

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And

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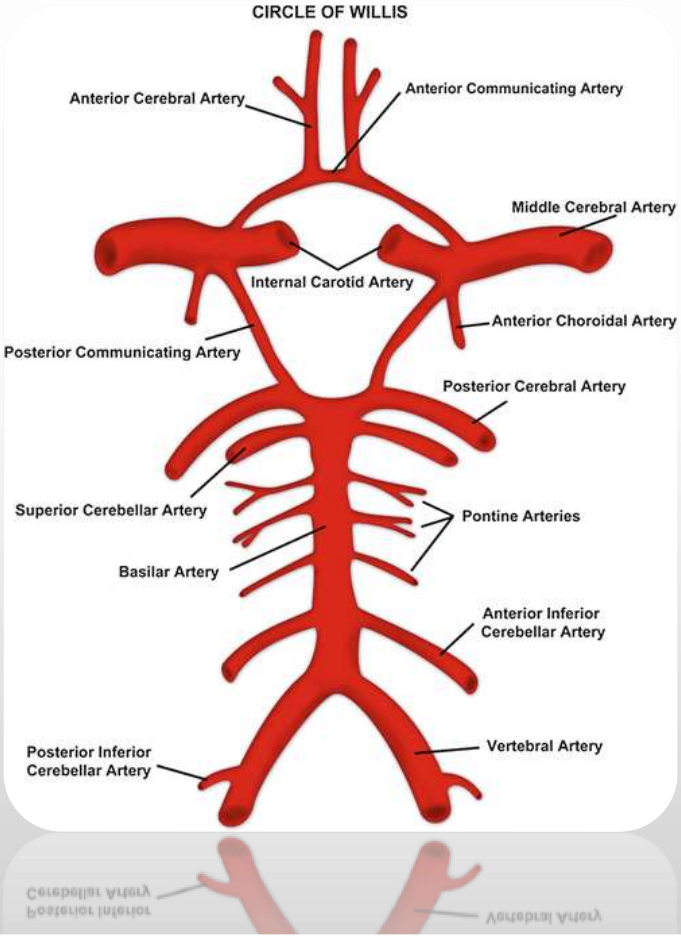
WHAT ARE STROKE SYNDROMES



- Stroke syndromes comprises a group of symptoms that are typical for the vascular territory affected by the stroke.
- Large vessel Syndromes include ACA(Right and Left), MCA(Right and Left), PCA (Right and left), and Basilar.
- Each of these large vessel territories also incorporates specific syndromes associated with smaller/deeper branched vessels.
- Knowing and recognizing syndromes increases the prevalence of early accurate identification and treatment for a stroke.
- However, it's important to understand, that patient's presentations are not always straightforward and requires evaluating the patient from a comprehensive view.

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Send **brittanyberry865** to **22333**

TEST YOUR KNOWLEDGE: MATCH THE SYNDROME WITH CORRECT NIHSS SCORE

Patient A NIHSS score of 6

1A: Level of consciousness —> 0 = Alert; keenly responsive
1B: Ask month and age —> 1 = 1 question right
1C: 'Blink eyes' & 'squeeze hands' —> 0 = Performs both tasks
2: Horizontal extraocular movements —> 0 = Normal
3: Visual fields —> 0 = No visual loss
4: Facial palsy —> 0 = Normal symmetry
5A: Left arm motor drift —> 1 = Drift, but doesn't hit bed
5B: Right arm motor drift —> 0 = No drift for 10 seconds
6A: Left leg motor drift —> 3 = No effort against gravity
6B: Right leg motor drift —> 0 = No drift for 5 seconds
7: Limb Ataxia —> 0 = No ataxia
8: Sensation —> 0 = Normal; no sensory loss
9: Language/aphasia —> 0 = Normal; no aphasia
10: Dysarthria —> 0 = Normal
11: Extinction/inattention —> 1 = Visual/tactile/auditory/spatial/personal inattention (left)

- **A.** Right Middle Cerebral Artery Syndrome (R MCA)
- **B.** Right Anterior Cerebral Artery Syndrome (R ACA)
- **C.** Basilar Artery Syndrome

TEST YOUR KNOWLEDGE: MATCH THE SYNDROME WITH CORRECT NIHSS SCORE

Patient B NIHSS score of 12

1A: Level of consciousness —> 0 = Alert; keenly responsive
1B: Ask month and age —> 0 = Both questions right
1C: 'Blink eyes' & 'squeeze hands' —> 0 = Performs both tasks
2: Horizontal extraocular movements —> 1 = Partial gaze palsy: corrects with oculocephalic reflex (Right)
3: Visual fields —> 2 = Complete hemianopia (left)
4: Facial palsy —> 2 = Partial paralysis (lower face left)
5A: Left arm motor drift —> 2 = Some effort against gravity
5B: Right arm motor drift —> 0 = No drift for 10 seconds
6A: Left leg motor drift —> 2 = Some effort against gravity
6B: Right leg motor drift —> 0 = No drift for 5 seconds
7: Limb Ataxia —> 0 = No ataxia
8: Sensation —> 1 = Mild-moderate loss: can sense being touched (left)
9: Language/aphasia —> 0 = Normal; no aphasia
10: Dysarthria —> 1 = Mild-moderate dysarthria: slurring but can be understood
11: Extinction/inattention —> 1 = Extinction to bilateral simultaneous stimulation (left)

- **A.** Right Middle Cerebral Artery Syndrome (R MCA)
- **B.** Basilar Artery Syndrome
- **C.** Right Posterior Cerebral Artery (R PCA)

TEST YOUR KNOWLEDGE: MATCH THE SYNDROME WITH CORRECT NIHSS SCORE

Patient C NIHSS score of 26

1A: Level of consciousness —> 3 = Postures or unresponsive
1B: Ask month and age —> 1 = Dysarthric/intubated/trauma/language barrier
1C: 'Blink eyes' & 'squeeze hands' —> 2 = Performs 0 tasks
2: Horizontal extraocular movements —> 0 = Normal
3: Visual fields —> 0 = No visual loss
4: Facial palsy —> 1 = Minor paralysis (flat nasolabial fold, smile asymmetry left)
5A: Left arm motor drift —> 3 = No effort against gravity
5B: Right arm motor drift —> 3 = No effort against gravity
6A: Left leg motor drift —> 3 = No effort against gravity
6B: Right leg motor drift —> 3 = No effort against gravity
7: Limb Ataxia —> 0 = Does not understand
8: Sensation —> 2 = Coma/unresponsive
9: Language/aphasia —> 3 = Coma/unresponsive
10: Dysarthria —> 2 = Mute/anarthric
11: Extinction/inattention —> 0 = No abnormality

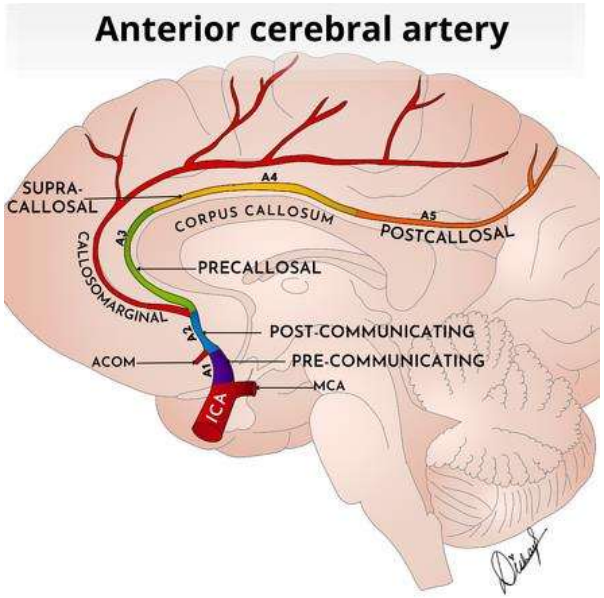
- **A.** Right Posterior Cerebral Artery (R PCA)
- **B.** Basilar Artery Syndrome
- **C.** Left Anterior Cerebral Artery Syndrome (L ACA)

Syndromes Overview

Selected Stroke Syndromes

Symptoms and Signs	Syndrome
Contralateral hemiparesis (maximal in the leg), urinary incontinence, apathy, confusion, poor judgment, mutism, grasp reflex, gait apraxia	Anterior cerebral artery (uncommon)
Contralateral hemiparesis (worse in the arm and face than in the leg), dysarthria, hemianesthesia, contralateral homonymous hemianopia, aphasia (if the dominant hemisphere is affected) or apraxia and sensory neglect (if the nondominant hemisphere is affected)	Middle cerebral artery (common)
Contralateral homonymous hemianopia, unilateral cortical blindness, memory loss, unilateral 3rd cranial nerve palsy, hemiballismus	Posterior cerebral artery
Monocular loss of vision (amaurosis)	Ophthalmic artery (a branch of the internal carotid artery)
Unilateral or bilateral cranial nerve deficits (eg, nystagmus, vertigo, dysphagia, dysarthria, diplopia, blindness), truncal or limb ataxia, spastic paresis, crossed sensory and motor deficits*, impaired consciousness, coma, death (if basilar artery occlusion is complete), tachycardia, labile blood pressure	Vertebrobasilar system
Absence of cortical deficits plus one of the following: • Pure motor hemiparesis • Pure sensory hemianesthesia • Ataxic hemiparesis • Dysarthria–clumsy hand syndrome	Lacunar infarcts
* Ipsilateral facial sensory loss or motor weakness with contralateral body hemianesthesia or hemiparesis indicates a lesion at the pons or medulla.	

Syndromes Overview



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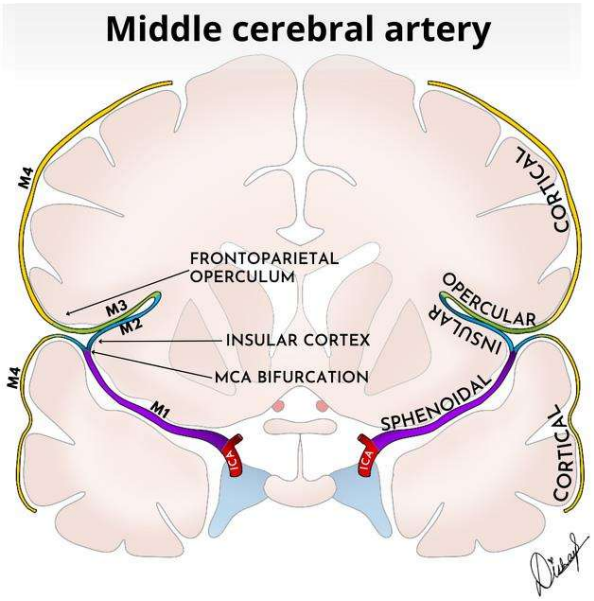

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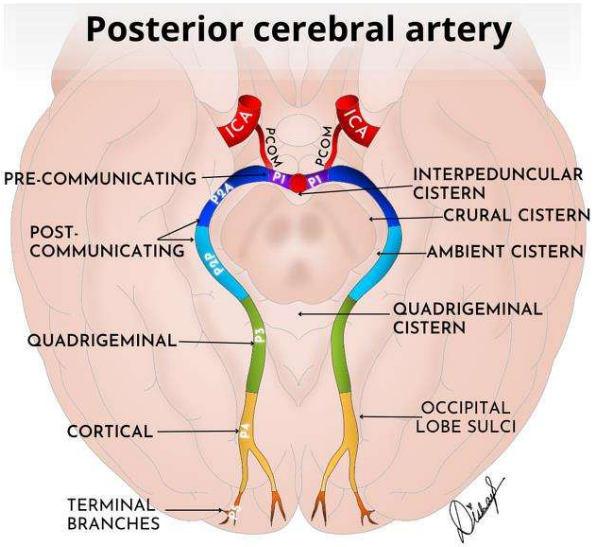

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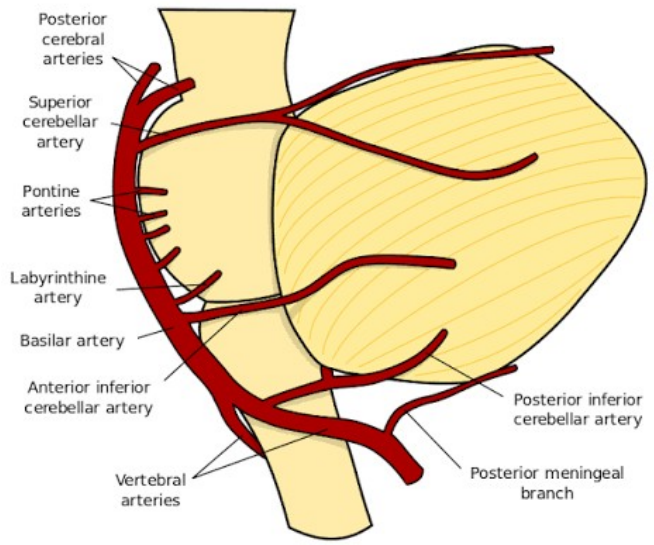

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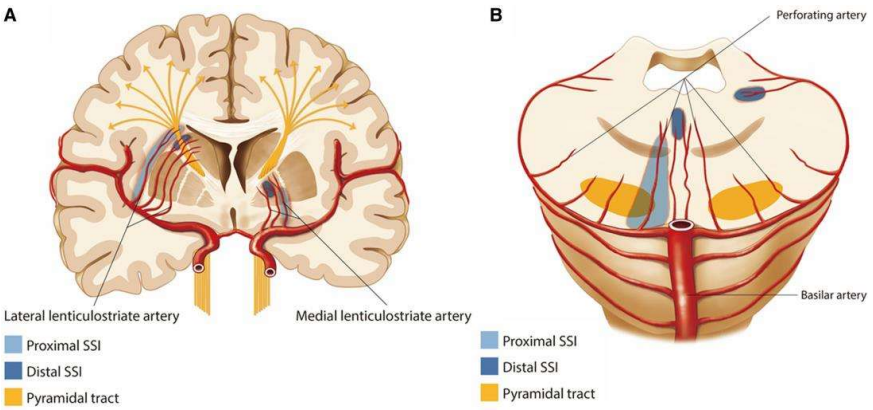

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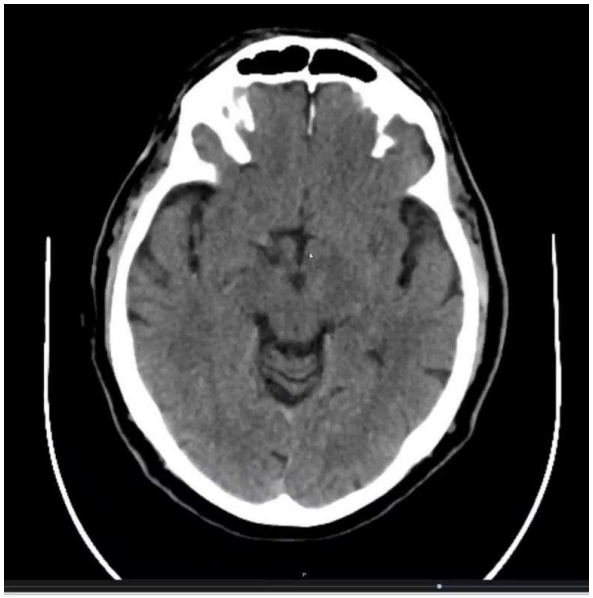
CASE 1

- 86 year old RH male
- History of HTN and TIAs(similar presentation, 2-3, episodes in 8/2025) who presented to ED with right sided weakness and numbness. LKN 11pm prior to going to bed the night before. Patient woke up the following morning with right arm and leg weakness/numbness, right facial droop, and slurred speech. Patient waited for it resolve as it had in the past, and after several hours of no resolution, was driven by family to UTSW for further evaluation. NIH 5 for right arm and leg drift, numbness, facial droop, and dysarthria. BP was 193/87 on arrival.

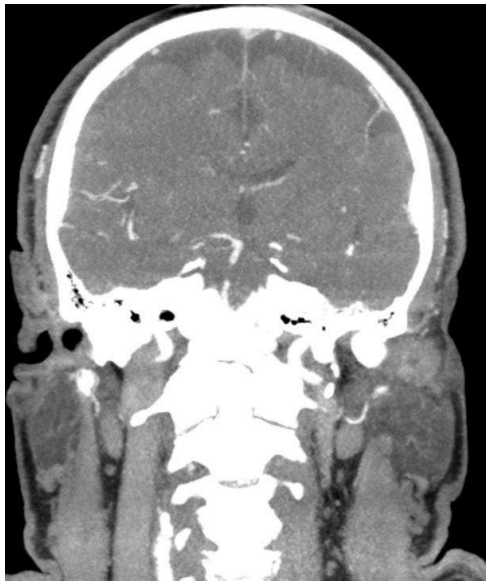


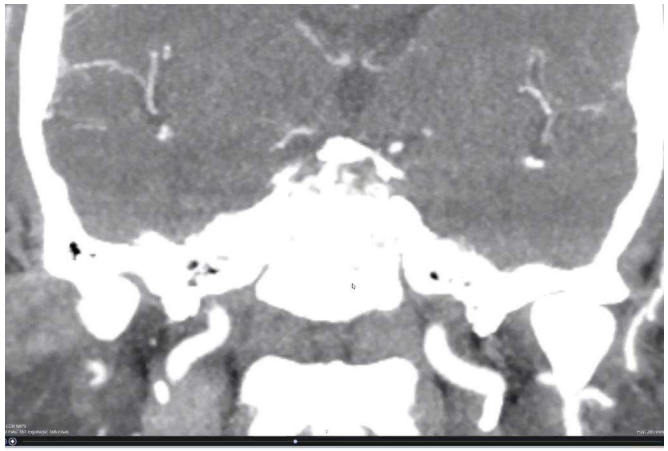
NIH Stroke Scale
Stroke scale components:
1a. Level of Consciousness: 0 – alert
1b. LOC Questions: 0 - answers both correctly
1c. LOC Commands: 0 - performs both correctly
2. Best Gaze: 0 - normal
3. Visual: 0 - no visual loss
4. Facial Palsy: 1 – minor (right)
5a. Motor Arm (L): 0 - no drift
5b. Motor Arm (R): 1 - drift
6a. Motor Leg (L): 0 - no drift
6b. Motor Leg (R): 1 - drift
7. Limb Ataxia: 0 - absent
8. Sensory: 1 - mild to moderate loss (right)
9. Best Language: 0 - no aphasia
10. Dysarthria: 1 - mild to moderate dysarthria
11. Extinction and Inattention: 0 - no neglect
Score and Interpretation:
Score: **5**

Would you suspect a large vessel or lacunar syndrome?

A. Large Vessel
B. Lacunar

CASE 1 CONT.





- Of note, patient was OOW for TNK. CTH Chronic infarct in the left corona radiata/internal capsule as well as the right internal capsule. CTA with radiology read for short segment occlusion of the basilar artery with reconstituted flow distally.

What intervention could be considered at this point?

A. Stent
B. Mechanical Thrombectomy
C. Nothing

Do you suspect an acute basilar occlusion based on exam?

A. Yes
B. No

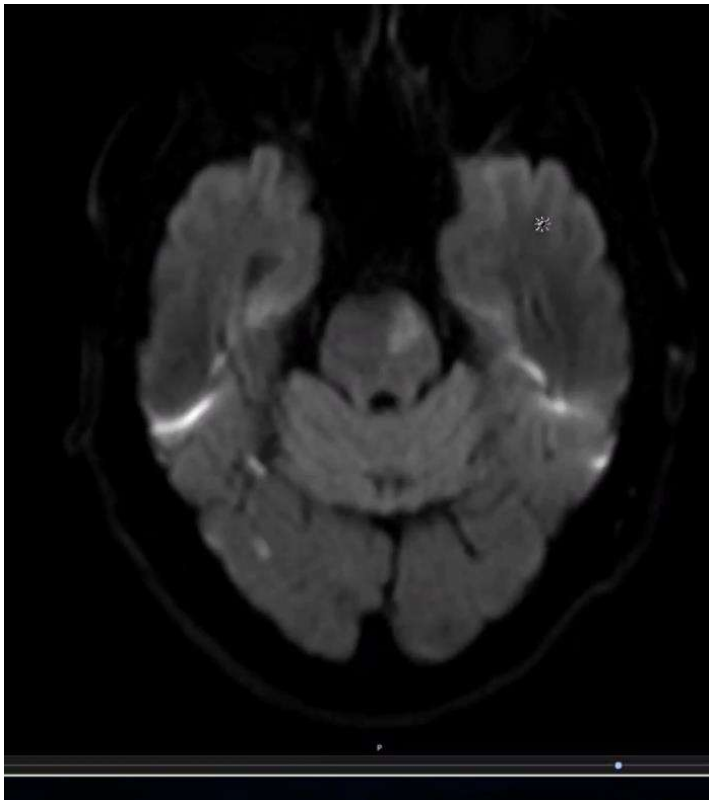
CASE 1 CONT.

Discussed case with NIR. Given exam not consistent with an acute basilar occlusion, suspect that this is acute on chronic ICAD, and decision made for no MT.

MRI with multiple punctate foci within the left parietal lobe, left hemi pons, right occipital lobe, and right posterior temporal lobes in keeping with acute to early subacute acute infarcts.

We suspected that the scattered multifocal foci was due to embolism of the basilar artery

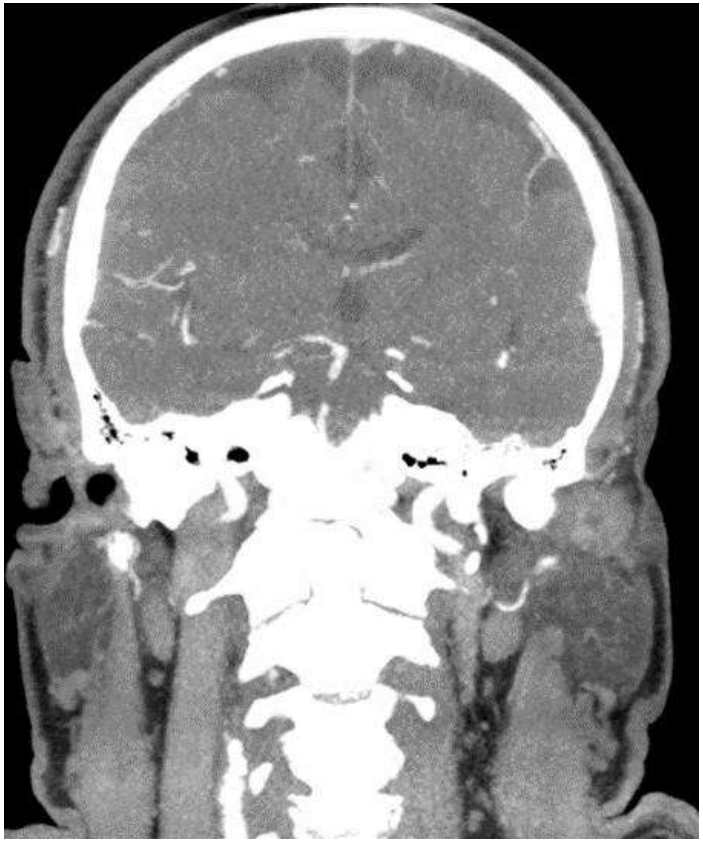
Patient was on DAPT with ASA and Plavix since 8/18/25.



CASE 1 CONT.

What antithrombotic plan would you consider?

A. Continue DAPT
B. ASA Monotherapy
C. Heparin gtt



CASE 1 CONT.

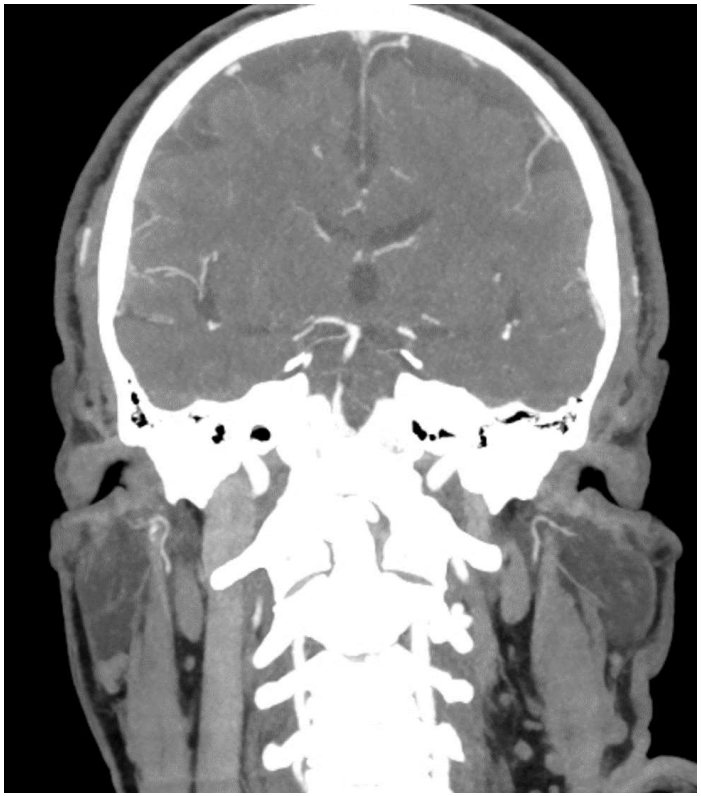
Decision made for low therapeutic goal heparin gtt (no bolus) and close monitoring overnight.

Patient remained stabled with some slight improvement the following morning.

Repeat CTA head and neck completed 11/22 to evaluate for recanalization and was grossly unchanged compared to prior imaging.

ASA assay resulted with adequate response 11/24, heparin gtt stopped that morning, and patient placed on ASA 81 mg.

NIH 5 at discharge.



Case 2

61 yr old RH Hispanic male with no known medical hx, doesn't regularly see a physician, who presented to the ED after a fall.

He couldn't feel his left arm and leg and didn't feel the floor and he fell. Tongue felt heavy and speech was slurred.

Case 2 Cont.

- NIHSS 6
- Left Facial palsy – 1
- LUE – 1
- LLE – 2
- Sensory – 1 (left side)
- Dysarthria – 1 (mild right tongue deviation)
- LKW/ Symptom onset : The night before arrival to the ED
- Arrival to the ED: The following morning after symptom onset.
- BP 183/99

Case 2 Cont.

CT Brain did not show any acute intracranial abnormality. Showed chronic microvascular changes.

Will you consider Thrombolytics?

Yes	No

Case 2 Cont.

TNK was not considered as he presented outside the window

Underwent MR Brain/ MRA Brain/neck w/wo.

Case 2 Cont.

Where could the lesion be?

1. Right medial medulla

2. Left lateral medulla

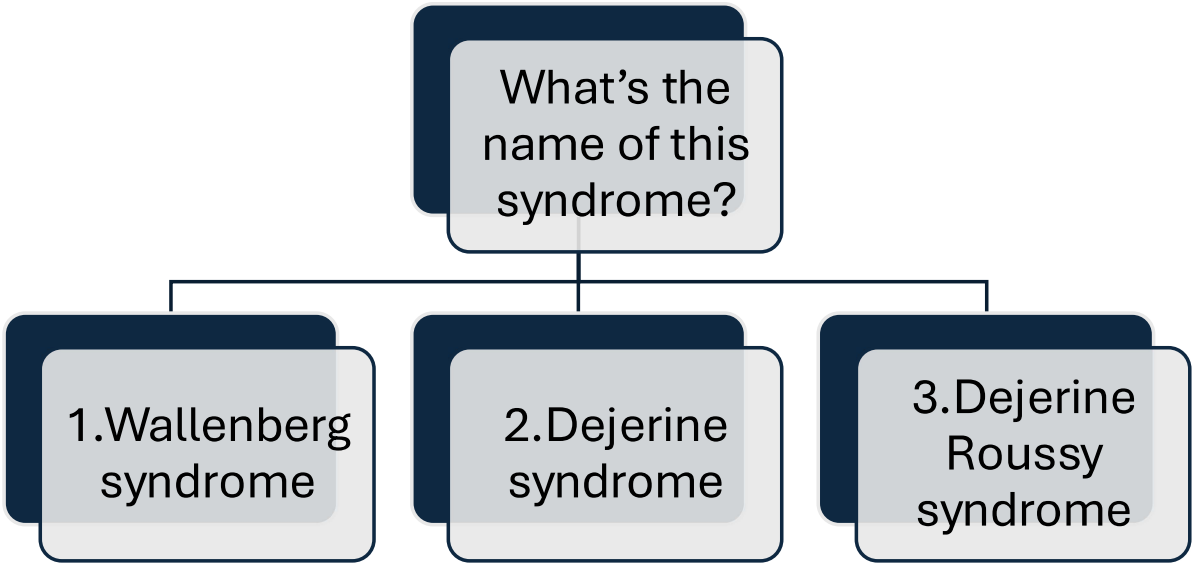
3. Right Pons

4. Right cerebellum

Case 2 Cont.

MR Brain/ MRA Brain/neck showed acute infarct of the right medial medulla and focal severe stenosis of the proximal V4 segment of the right vertebral artery.

Case 2 cont.


What's the name of this syndrome?
1.Wallenberg syndrome
2.Dejerine syndrome
3.Dejerine Roussy syndrome

Case 2 cont.

What's the possible etiology?

LDL 126 mg/dl

A1C 6.2%

TTE w/ EF of 58%, normal chambers, no shunt

1. Small vessel disease

2. ICAD

3. Large vessel disease

Case 2 cont.

Etiology was thought to be SVD vs ICAD iso severe proximal right V4 segment stenosis

Case 2 Cont.

What would be the treatment plan?

1. Aspirin

2. DAPT

Case 2 cont.

- Started on Aspirin 325 mg daily with plan for strict risk factor control

CASE 3

- 49-year-old female
- History of von Willebrand factor disease, HTN, and a former smoker who presented to ED at 8pm 8/14 with acute onset of confusion, left-sided numbness, weakness, and facial droop. LKW 1830, 1.5 hours prior to presentation while stretching after light weight training. Shortly after, family witnessed her to have abnormal speech described as "bubble in her mouth" and possible drooling on left side. En route to the emergency department, patient became more confused and aphasic per EMS.
- While in the CT scanner, patient was vomiting, had labile blood pressures, systolics as low as 80 and up to 180. Patient was also noted to have intermittent tachycardia and diaphoresis.

Case 3 Cont.

NIH Stroke Scale

Stroke scale components:

1a. Level of Consciousness: 0 – alert
1b. LOC Questions: 0 - answers both correctly
1c. LOC Commands: 0 - performs both correctly
2. Best Gaze: 0 - normal
3. Visual: 2 - complete hemianopia (Left)
4. Facial Palsy: 2 – partial (Left)
5a. Motor Arm (L): 2 - can't resist gravity
5b. Motor Arm (R): 0 - no drift
6a. Motor Leg (L): 2 - can't resist gravity
6b. Motor Leg (R): 0 - no drift
7. Limb Ataxia: 0 - absent
8. Sensory: 2 - severe to total loss (Left)
9. Best Language: 2 - severe aphasia
10. Dysarthria: 2 - near to unintelligible
11. Extinction and Inattention: 1 - partial neglect (Left)

Score and Interpretation:

Score: **15**

What syndrome should you suspect?

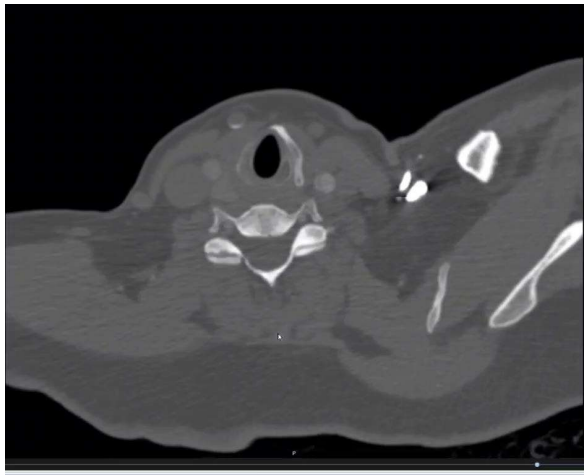
A. L MCA Syndrome
B. R MCA Syndrome
C. R PCA syndrome

Based on her presentation, are you concerned about any other acute process?

A. No
B. Yes, MI
C. Yes, Aortic Dissection

CASE 3 CONT.

- CTA H/N showing R ICA occlusion, aortic arch dissection with flap extending on L carotid artery to proximal L ICA (with apparent mural thrombus) as well as a ? R vertebral artery dissection.



Should this patient receive TNK?

A. Yes

B. No

Why do you think this patient presented with aphasia? (not a poll question)

Should NeuroIR be notified for possible mechanical thrombectomy of R ICA occlusion?

A. Yes

B. No

CASE 3 CONT.

She went for emergent total arch replacement, AV replacement w/ On-x mechanical heart valve, extra-anatomic bypass to innominate artery with graft and to left carotid artery with graft.

Post-op exam improved as she was able to move all extremities against gravity (left slightly less than right) and was noted to have severe aphasia. Recommended a MRI brain when able.

7am the following morning, Neurology discussed case with NIR regarding R ICA occlusion as patient was still in window for intervention. Repeat CTA obtained to evaluate current vascular flow and was noted to have reconstituted flow through the R ICA.

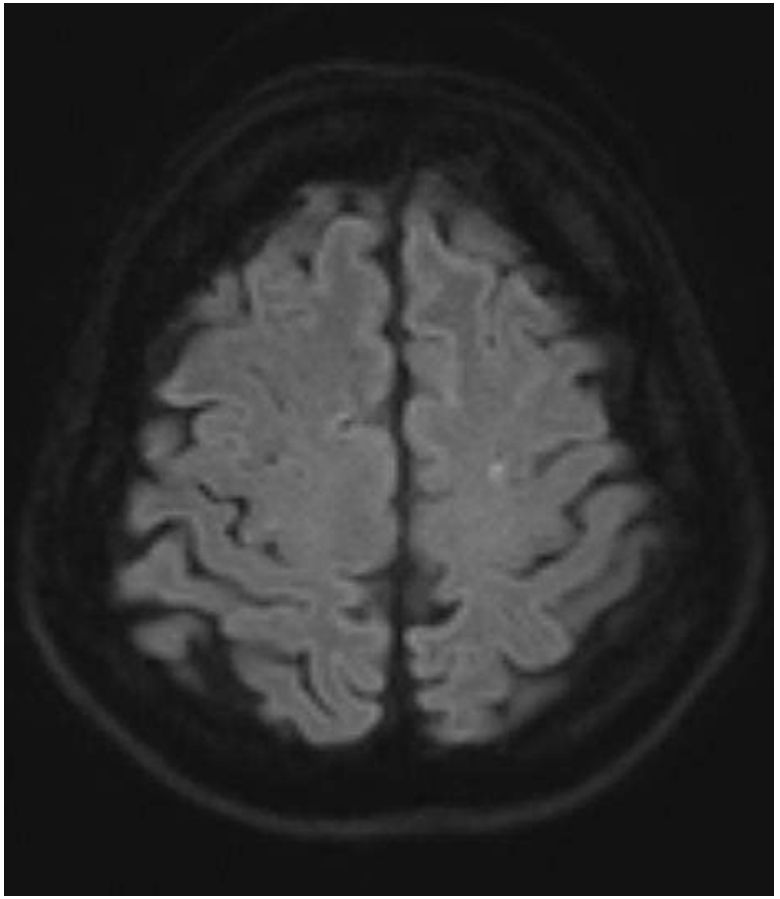
Started on warfarin for mechanical heart valve. MRI brain not completed in-patient as she was not able to lay flat. It was later obtained in the OP setting 10/15. Patient reported being left- handed. She also had a repeat CTA head and neck 9/15 which showed left common carotid artery dissection extending into the proximal ICA.

How would you explain the reconstituted flow of the R ICA?

A. Vasospasm
B. The clot lysis or embolization
C. Pseudo Occlusion

Case 3 Cont.

A few small foci of DWI hyperintensity in the frontal lobe bilaterally, nonspecific but may reflect evolving subacute infarcts.



Case 4

64-year-old RH AAM with acute L-sided numbness and weakness ~ 8:30 am. Woke up at 6 am fine, went back to sleep and woke back up at around 8:30 am. As he was getting ready for the gym, suddenly fell to his knees, felt numbness and weakness to the left side, and speech was slurred. Unable to get himself back up, called EMS, brought in by ambulance. Denied any similar symptoms in the past and denies other medical ROS.

PMH of Afib on Eliquis (stopped taking for past 2 weeks due to cost), HTN, HLD, CHF, and BMI>35.

Case 4 Cont.

- In the ED, initial BP 200/100. He was also found to have a displaced avulsion fracture of the left elbow, olecranon fracture from the fall.

- NIHSS 5
- Left NLF – 1
- LUE drift – 1
- LLE drift – 1
- Sensation – 1
- Dysarthria – 1

LKW: 6 am

Symptom onset : 8:30 am

ED arrival time: 9:45 am

Case 4 cont.

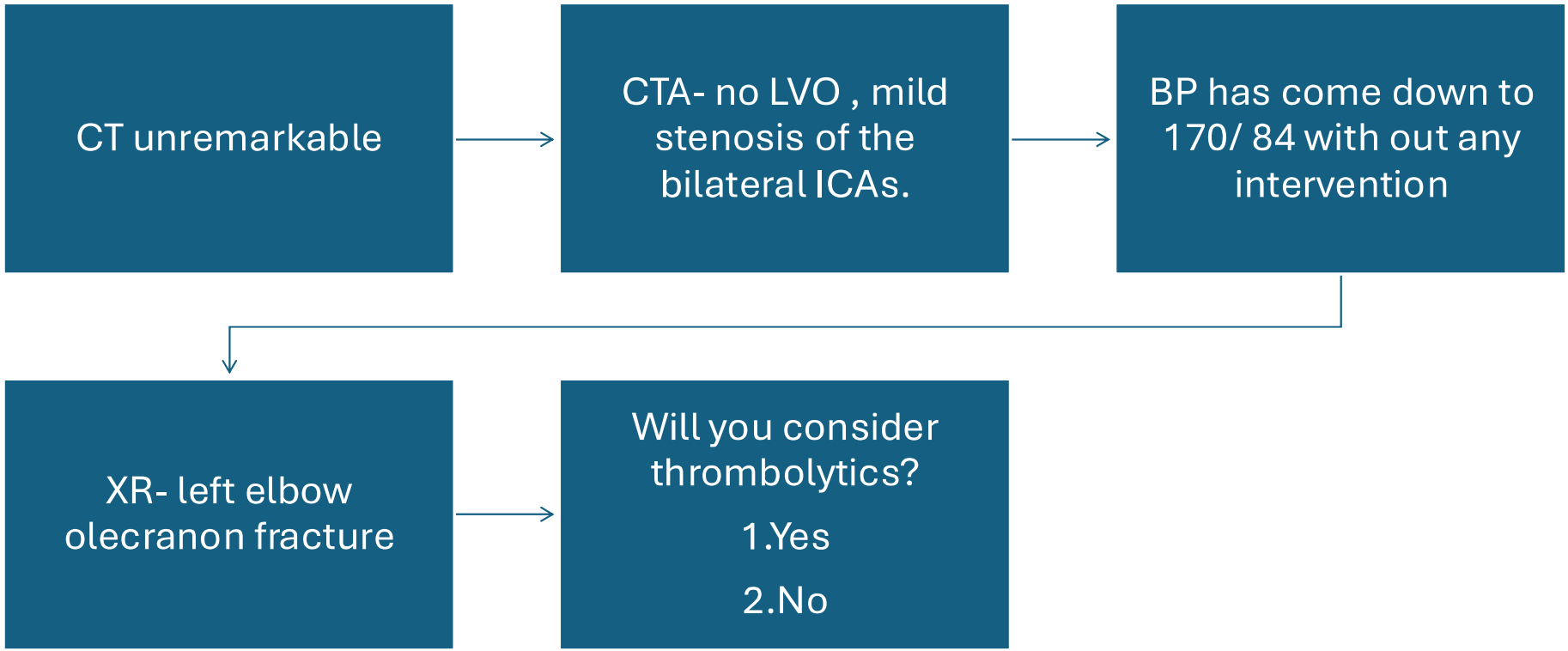
What would be the next step?

1. CTH/ CTA Head/neck

2. MR Brain/ MRA Brain/neck

3. Antihypertensives

Case 4 Cont.


CT unremarkable
CTA- no LVO , mild stenosis of the bilateral ICAs.
BP has come down to 170/ 84 with out any intervention
XR- left elbow olecranon fracture
Will you consider thrombolytics?
1.Yes
2.No

Case 4 Cont.

- TNK was administered due to disabling symptoms knowing the fact that patient is at risk of neurological deterioration due to acute ischemic stroke or hemorrhagic transformation.

Case 4 Cont.

Where could the lesion be?

1. Multifocal infarcts
2. Right thalamocapsular region
3. Right centrum semiovale
4. Left Cerebellum

Case 4 Cont.

- MR Brain showed restricted diffusion involving the **right thalamus adjacent to posterior limb of internal capsule**, most consistent with acute infarction.

Case 4 Cont.

What's the possible etiology?

LDL : 70 mg/dl

A1C 4.9%

TTE w/ EF of 56%, biatrial dilatation

1. Small vessel disease
2. Cardio embolic
3. ICAD

Case 4 cont.

Etiology : SVD vs Couldn’t r/o cardio embolic origin as he was not taking AC for A Fib

He was restarted on apixaban for A Fib

CASE 5

- 74 year old RH female
- History of DDKT (2013), T2DM, HTN, HLD, CAD s/p CABG (2015) and stenting LM to Lcx (2020) who was admitted as a transfer from and OSH for AKI on transplanted kidney i/s/o HTN emergency.
- Code stroke activated for AMS at 1010 4/16. LKN 0950 20 minutes prior to activation. Per bedside RN, at that time patient Aox4, moving all extremities equally, able to follow commands, and verbally responded appropriately. At 1005, patient found leaning to left, moving the right less, not following commands, or verbally responsive to questions.

NIH Stroke Scale
Stroke scale components:
1a. Level of Consciousness: 1 – Drowsy
1b. LOC Questions: 2 - answers none correctly
1c. LOC Commands: 2 - performs neither correctly
2. Best Gaze: 0 - normal
3. Visual: 0 - no visual loss
4. Facial Palsy: 0 - normal
5a. Motor Arm (L): 1 - drift
5b. Motor Arm (R): 1 - drift
6a. Motor Leg (L): 1 - drift
6b. Motor Leg (R): 3 - no effort against gravity
7. Limb Ataxia: 0 - absent
8. Sensory: 0 - normal
9. Best Language: 3 - mute
10. Dysarthria: 2 - near to unintelligible
11. Extinction and Inattention: 0 - no neglect
Score and Interpretation:
Score: **17**

What syndrome should you suspect?

A. L ACA Syndrome
B. L MCA Syndrome
C. L PCA Syndrome

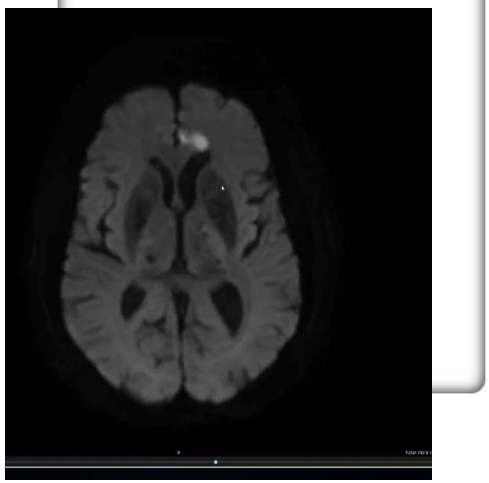
CASE 5 CONT.

En route to CT, noticed patient was having some rhythmic left hand movement that would not cease to passive movement or grasping hand by examiner. Asked primary team if this occurred before to which they replied no. It continued to progress during code stroke to entire left arm. While on the CT scanner, patient was visibly seen to have rhythmic bilateral arm shaking lasting about 45 seconds. She was also noted to have upward gaze. CTA aborted given concern for patient actively seizing. CTH reviewed and without any acute abnormality.

Shortly after patient appeared confused and trying to get out of bed. Of note, labs significant for up-trending creat. at 6.03 (from 5.18 the day prior) and elevated tacrolimus level of 22.8 (from 7.8 the day prior). On ASA, held yesterday for renal biopsy.

Should this patient receive TNK?

A. Yes
B. No



CASE 5 CONT.

Given highest concern/suspicion for an active seizure, decision made for IV keppra load 3 g and IV ativan 2 mg.

General neurology was called to bedside, and patient hooked up to cont. EEG.

There was concern for tacrolimus-induced neurotoxicity, thus initially held and later switched to cyclosporine.

Stroke team recommended MRI Brain and MRA head and neck once stable from a seizure standpoint, which was obtained the following day after quinton placement for HD.

CASE 5 CONT.

EEG was significant for abundant sharp waves, maximal left frontal. Patient started on Keppra 500 mg IV Daily.

MRA Brain with Severe stenosis with near complete occlusion of the proximal left A2 segment.

TTE with concentric LVH, EF 60-65%, Severely enlarged left atrium

SBP 140s – 170s during admission but noted a drop down to 117 prior to neuro change. HR stable between 60s-70s, not on tele.

What is the suspected etiology?

A. SVD
B. Large artery Disease
C. Cardio-embolism

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