IMEC'S MEETING INVITATION

INTERNAL MEDICINE ENGLISH CLUB

Challenges of Stroke Diagnosis Through Clinical Cases

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17:00
Fri, Nov 1st, 2019

Internal Medicine Meeting Room, HUMP

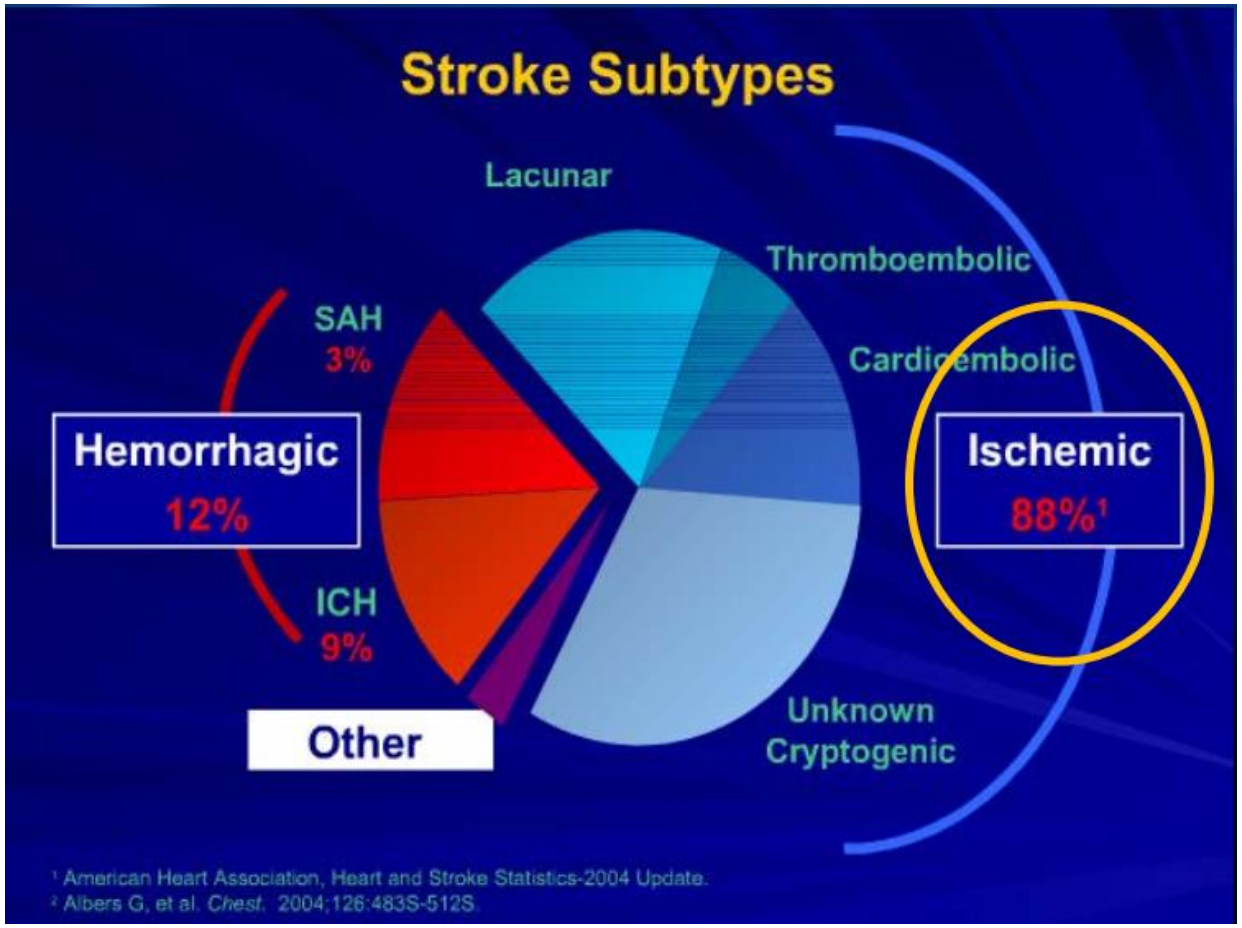
Burden of Stroke

Key statistics

Every **two seconds**, someone in the world will have a **stroke**.

State of the Nation Stroke statistics - February 2018

Stroke Classification



Case 1

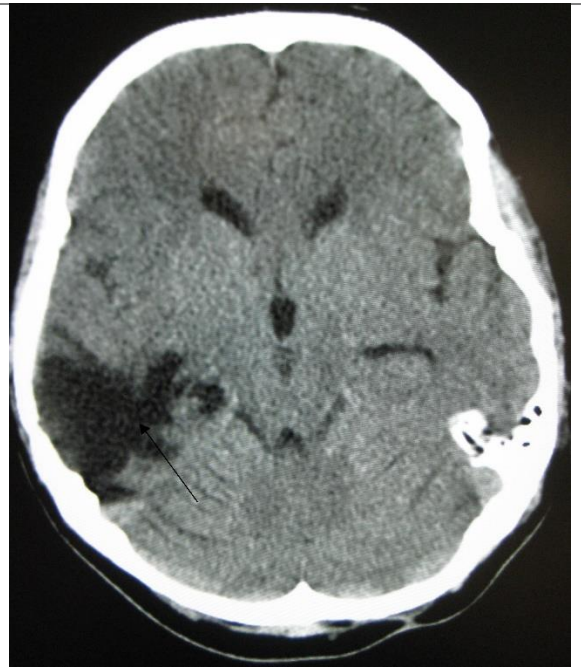
A 50 years old male was bring to hospital by the pedestrians. They found him lied down on the sidewalk with the confusional state with the smell of alcohol. And they took him to the hospital right away.

On examination:

- GCS: E4V2M5
- Pupils were normal
- No facial palsy
- Left side weakness (unresponsive with painful stimulation)
- Normal finger stick glucose level

What is your most likely diagnosis?

Stroke or not Stroke (Traumatic brain injury, Focal seizure with postictal Todd's hemipresis, tumor…)



Difficulties:

- Unwitness
- No prior history
- If you wait, you lose gold time
- Uncorporated taking MRI

WINDOW TREATMENT OF THROMBOLYSIS

After taking CT, pt had recovered…

He had prior history of motor accident and was on antiepileptic treatment.

He had several episodes of postictal hemiparesis and dysarthria.

Diagnosis: Focal motor epilepsy with postictal Todd's hemiparesis

Stroke Mimics

- An UMBRELLAR term
- Used once stroke has been excluded and other convincing conditions has been found.
- As OVERDIAGNOSING a patient with ischemic stroke.

TABLE 1-4 Common Acute Stroke Mimics

- Postictal deficits (Todd paralysis)
- Hypoglycemia
- Migraine (hemiplegic, with aura)
- Hypertensive encephalopathy
- Reactivation of prior deficits
- Mass lesions
- Subarachnoid hemorrhage
- Peripheral vestibulopathy
- Conversion reaction

Seizure

- Accounts for 20% of mimics.
- Temporary focal weakness after seizures = Todd's paralysis
- Overactivity → seizure then, exhaustion of motor cortex → weakness
- Weakness usually last hours but infrequently days.

Original Contributions

Distinguishing Between Stroke and Mimic at the Bedside
The Brain Attack Study

Peter J. Hand, MD, FRACP; Joseph Kwan, MD, MRCP; Richard I. Lindley, MD, FRACP; Martin S. Dennis, MD, FRCP; Joanna M. Wardlaw, MD, FRCP, FRCR

TABLE 2. Causes of Stroke Mimics (n=109)*, Subdivided by Time to Presentation

Condition	Total Number (%)†	Mimics Presenting	
		Within 6 Hours	After 6 Hours
Seizure	23 (21.1%)	18 (29.0%)	5 (10.6%)
Sepsis	14 (12.8%)	6 (9.7%)	8 (17.0%)
Toxic/metabolic	12 (11.0%)	6 (9.7%)	6 (12.8%)
Space occupying lesion	10 (9.2%)	3 (4.8%)	7 (14.9%)
Syncope/presyncope	10 (9.2%)	9 (14.5%)	1 (2.1%)
Acute confusional state	7 (6.4%)	3 (4.8%)	4 (8.5%)
Vestibular dysfunction	7 (6.4%)	3 (4.8%)	4 (8.5%)
Acute mononeuropathy	6 (5.5%)	4 (6.5%)	2 (4.3%)
Functional/medically unexplained symptoms	6 (5.5%)	4 (6.5%)	2 (4.3%)
Dementia	4 (3.7%)	2 (3.2%)	2 (4.3%)
Migraine	3 (2.8%)	2 (3.2%)	2 (4.3%)
Spinal cord lesion	3 (2.8%)	- (0%)	3 (6.4%)
Other	3 (3.7%)	2 (3.2%)	1 (2.1%)
Total	109 (100%)	62 (100%)	47 (100%)

TIPS for Stroke Mimics

- Ctscan to partially rule out space-occupying lesions.
- Glucose to rule out hypo /hyperglycemia
- In the study, the most powerful predictors of an accurate stroke diagnosis were:
  - Definite history of focal neurologic symptoms
  - NIHSS score greater than 10

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TABLE 3. Logistic Regression Model for Predicting the Diagnosis of Brain Attack

Variable	OR	95% CIs
Known cognitive impairment	0.33	(0.14–0.76)
An exact onset could be determined	2.59	(1.30–5.15)
Definite history of focal neurological symptoms	7.21	(2.48–20.93)
Any abnormal vascular findings*	2.54	(1.28–5.07)
Abnormal findings in any other system†	0.44	(0.23–0.85)
NIHSS=0‡		
NIHSS 1–4	1.92	(0.70–5.23)
NIHSS 5–10	3.14	(1.03–9.65)
NIHSS >10	7.23	(2.18–24.05)
The signs could be lateralized to the left or right side of the brain	2.03	(0.92–4.46)
OCSP classification was possible	5.09	(2.42–10.70)

Case 2

A 64-year-old woman was admitted to the Stroke Unit due to SUDDEN right hemiparesis and loss of contact with others as she was having dinner?.

Prior history of Diabetes and Hypertension.

On examination:…

GCS: E1V3M4 8pts

BP: 160/90 mmHg, Pulse: 70 l/p

Pupils normal, swinging light reflex normal

- Kept her arm as I postured.
- Hypertone in both arm.

- Blinking and chewing continuously
- No facial palsy had been detected.

Blood Glucose: 160mg/dl (8.8 mmol)

What is your most likely diagnosis?

Stroke or not Stroke

(Parkinson's disease, tonic seizure, oromandibular dyskinesia, Psychological Disorder)

- PD, seizure, oromandibular dyskinesia → neurologist
- Psychological Disorder → psychiatrist

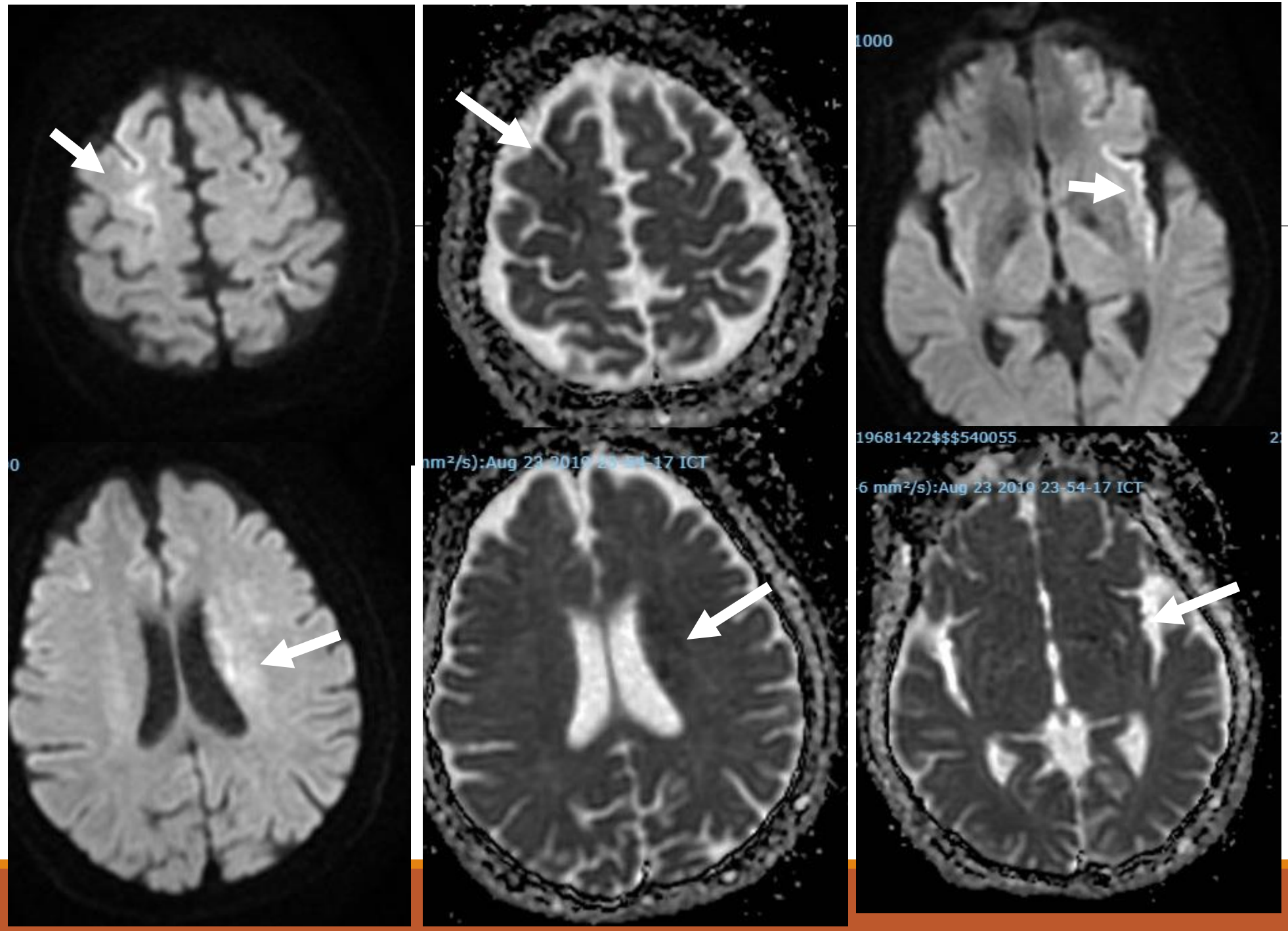
Need further investigation…

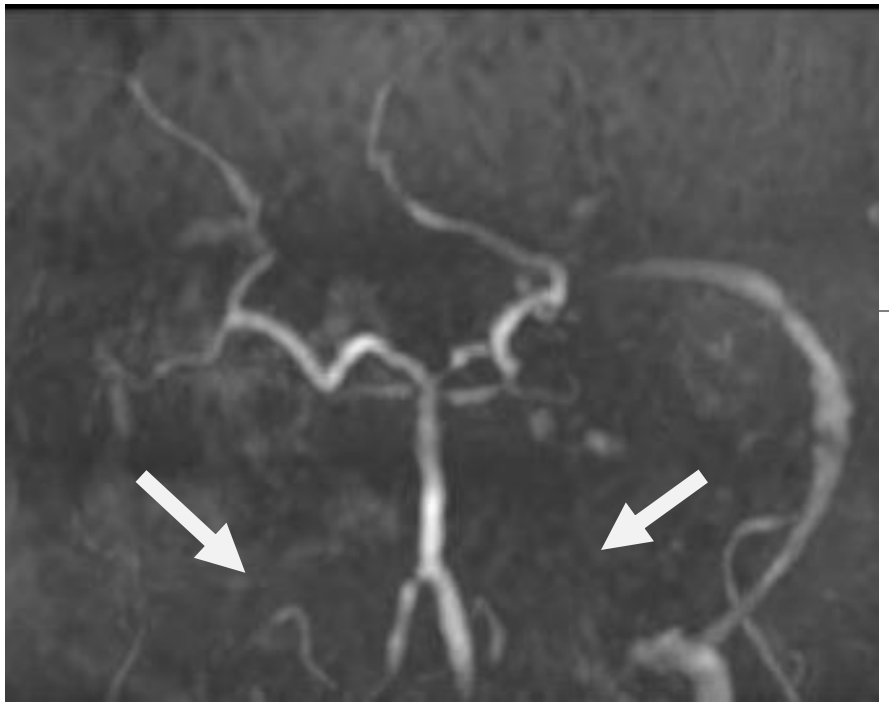
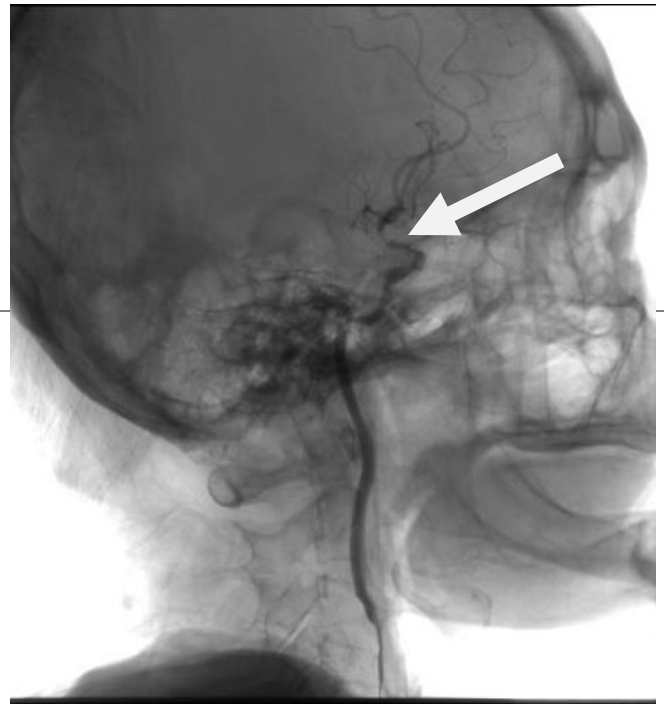
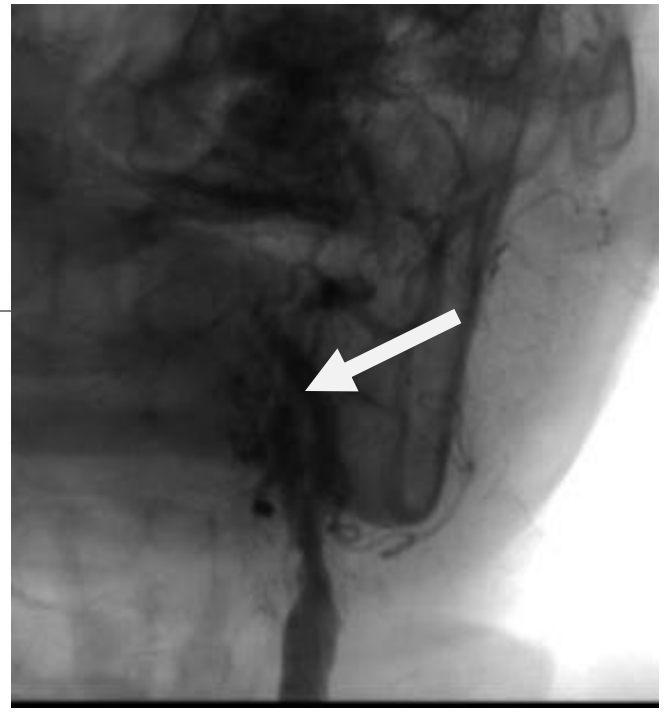
WASTE TIME

But if stroke, which part of the brain is affected???

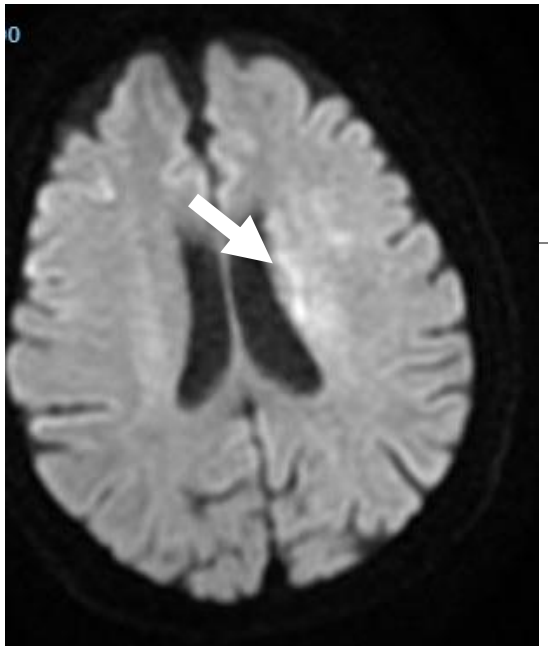
SUDDEN + ??FOCAL DEFICIT

MRI



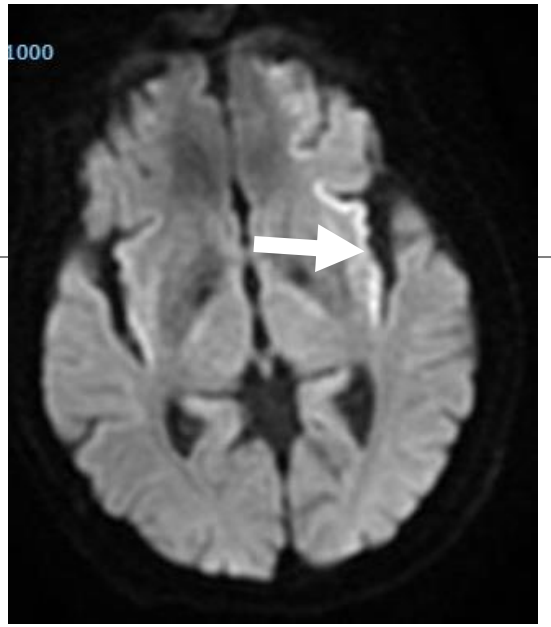




MRI: No flow in both ICA → severve stenosis or occlusion of both
DSA: stenosis in the right carotid artery and severe MCA occlusion. Occlusion of proximal part of Left ICA



Very mild and vague weakness on the right side

(several tracts were injured)



Bilateral Hypertonia still unexplainable:

- Frontal seizure
- Bilateral basal ganglia ischemia
- Any other mechanisms…

Cortical insula (opercula) involvement explained the continuous chewing and blinking.

After reperfused, she continued…

Chewing and blinking

Mild weakness on the right arm 4/5

The lesions seen on DWI + ADC are unrescueable (infarcted)

Comments why I underdiagnosed:

+ I forgot taking the **SUDDEN ONSET** into account → high specificity for stroke.

+ **FOCAL DEFICIT** in the start of episode should weigh more in the diagnosis, even not clear on current examination.

+ VASCULAR RISK FACTORs

Stroke Chameleons

- An UMBRELLAR term
- Describe an atypical stroke presentation that appears to mimic another disease process.
- As UNDERDIAGNOSING a patient with ischemic stroke.
- If continuing to go unrecognised → lost opportunity for revascularization and secondary prevention.

Just highlight « Acute vertigo » and « Decreased LOC »

TIPS for Acute vertigo

In a US population-based study, Kerber *et al* showed that 3.2% (53/1,666)of patients with symptoms of dizziness, imbalance and vertigo were diagnosed with stroke or transient ischaemic attack.

HINTS test

- HI: Head Impulse
- N: Nystagmus
- TS: Test of Skew

Case 3

A 59-year-old man was seen in the ED after developed confusional state with the onset was unwitnessed. He was last known to be normal 2 hours earlier.

GCS: E1V1M5 7pts

BP: 160/110 mmHg, HR: 80 l/p
His NIHSS score was 21 (mainly affected by decreased LOC)

Finger stick Glucose: 160mg/dl (8.8 mmol/L)

Non-contrast CT scan

What is the most like diagnosis?

What is your most likely diagnosis?

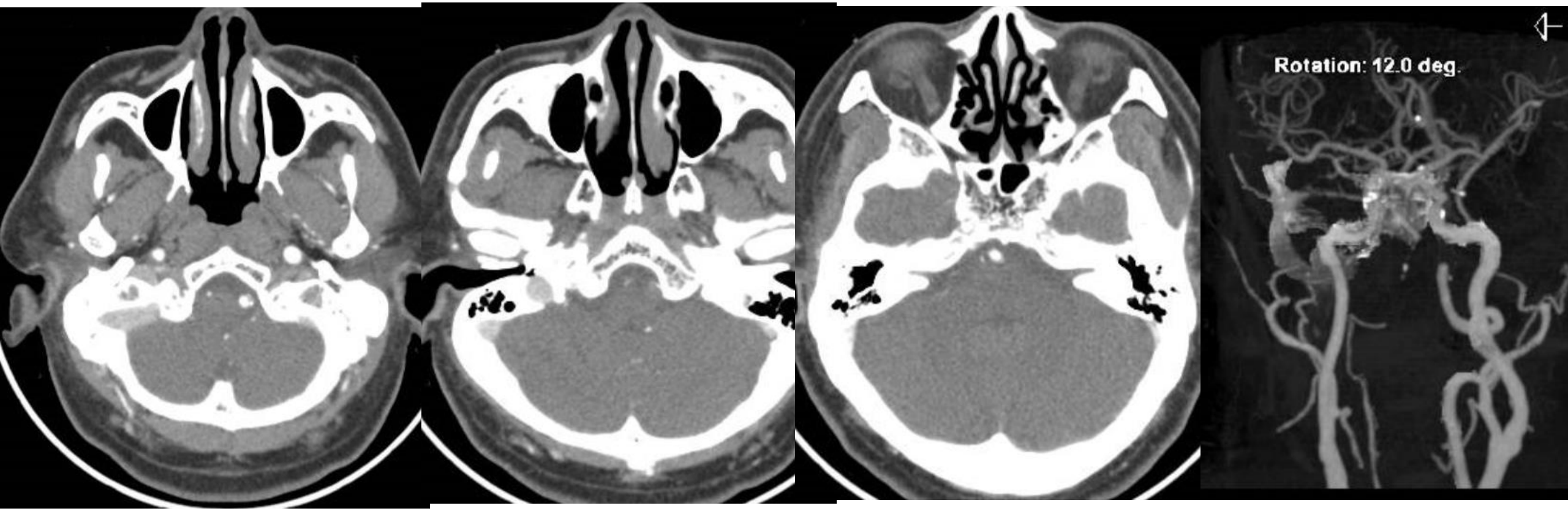
Stroke or not Stroke

(Metabolic encephalopathy: hepatic encephalopathy, electrolyte disturbances,…)

- Others → Further investigation
- Stroke → What is the next step?

WASTE TIME

But if stroke, which part of the brain is affected???



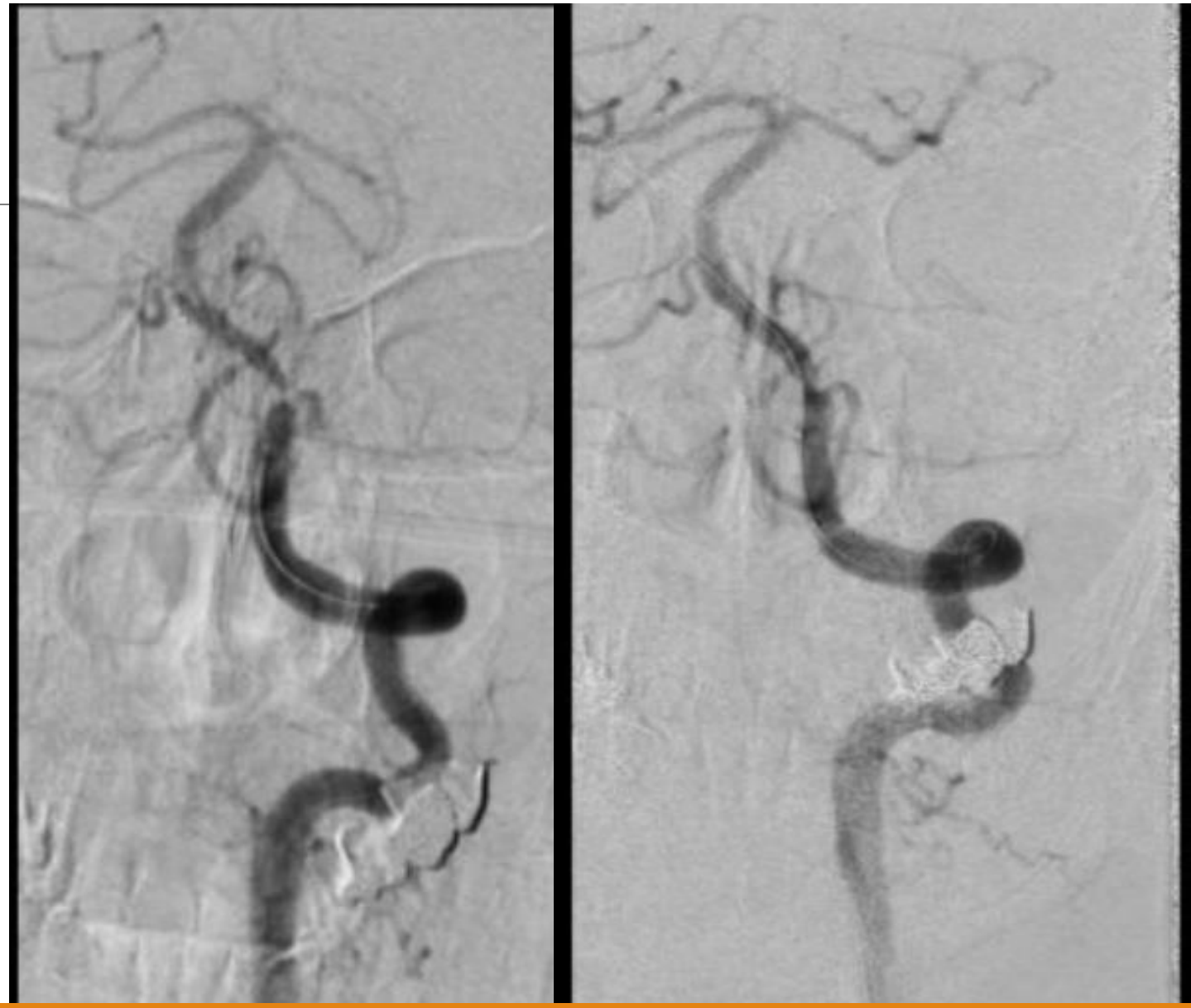
Hypoplasia of right VA→ compensated by hyperplasia of the left VA

Occlusion of terminal part (V3) of right and terminal part (V4) of left vertebral artery → Bilateral occlusion of Vas

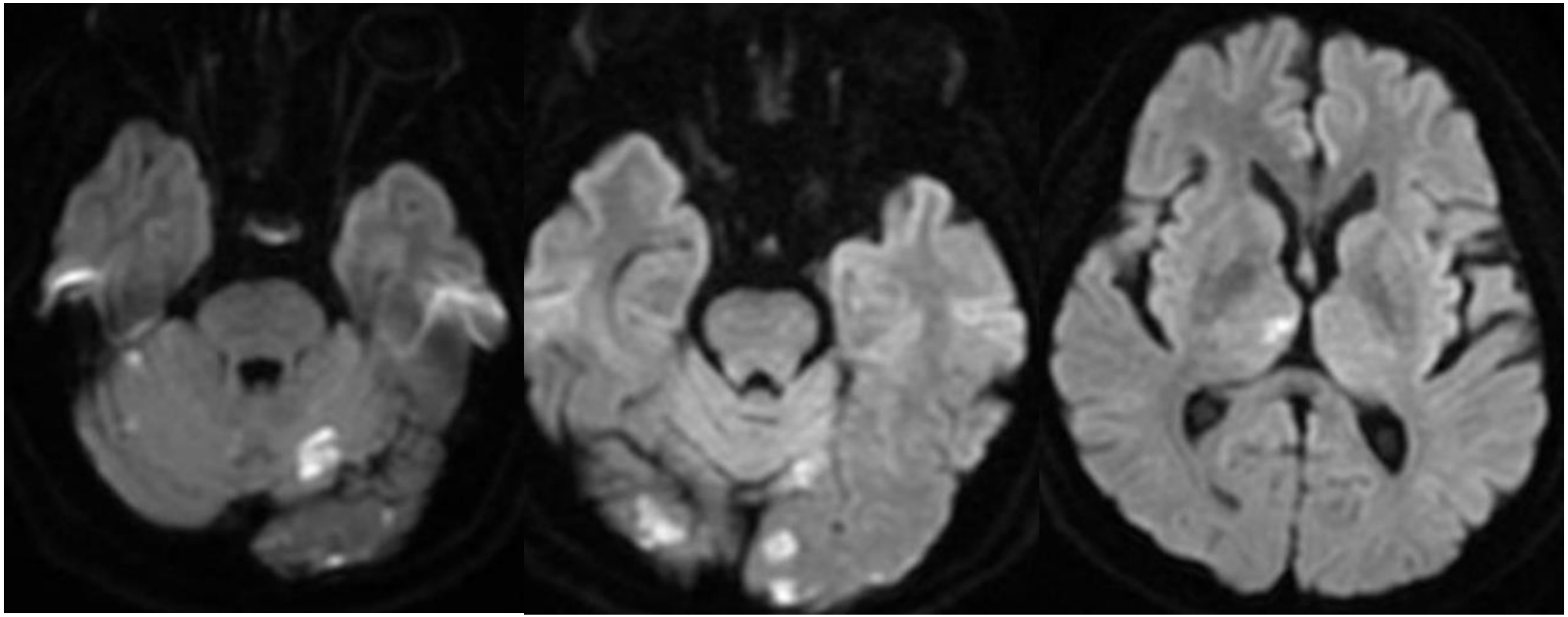
→

DSA

DSA:
Occlusion of terminal part of the Left vertebral artery.
Thrombectomy by stent retriever → Well revascularization



Brain MRI 1 day latter



Infarcted lesions in the cerebellum, both occipital lobes and right thalamus.

After reperfused, he backed to normal state…

Difficulties:

+ **SUDDEN ONSET** was unwitnessed.

+ **FOCAL DEFICITs** was very hard to detect especially in the posterior circulation stroke or in comatose pts.

The most suggestive clues in this case was hypodense lesions in the occipital lobes.

TIPS for decreased LOC

+ ABRUPT ONSET

+ Focal deficits

+ Vertical gaze palsy in bilateral thalamic infarction

+ Abnormalities of pupils

TAKE HOME MESSAGES

- Stroke should be suspected in any patient with sudden onset neurological symptoms, confusion or falls even if the symptoms initially appear to be unusual for stroke.

- Common stroke mimics include seizure, migraine, sepsis, syncope, and metabolic and functional disorders.

- Stroke can present as a chameleon with confusion, reduced conscious level or non-specific symptoms such as vertigo, hypertonia...