MRI BRAIN

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2ND YEAR RESIDENT –GENERAL MEDICINE DEPT. - PIMSR

- Case 1
- 76 year old female presented on 10 July 2025 at 10:00 AM with the complain of
- Acute onset of vertigo , imbalance , nausea and 1-2 episode of vomiting since 4-5 hours that morning.
- Patient was a known case of anemia , post total knee replacement, lest shoulder dislocation(managed conservatively) , and history of electrolyte imbalance 1-2 year ago.
- No H/O any headache , limb weakness , diplopia , fever , blurred vision , altered sensorium

- On arrival patient vitals :
- Afebrile
- P - 80 /min
- BP – 160/90 mmHg
- SpO2 – 95 % on RA
- RBS – 157 mg / dl

CNS examination: patient, conscious but appears restless, plantars b/l extensor, resting nystagmus present – towards left, no neck rigidity, kernig's negative. Further neurological examination was not possible because of patient's condition

CVS, Respiratory & Alimentary systems - normal

- Investigation on day of admission :
- HB-12.7 , TC-18610 , platelets -2,86,000
- PT/aPTT- 10.5 / 33
- HHH – Negative
- Na+ -128 , K+ -3.9 , Chloride- 93 , Creatinine – 0.4
- LFT – Total bilirubin – 0.8 , SGOT- 24 , SGPT-13 , Total proteins – 7.7, Albumin – 5.0 , ALP- 136
- Lipid profile – normal

- Probable differential diagnosis :
- 1. Acute CV accident involving posterior circulation
- 2.Acute paroxysmal vertigo
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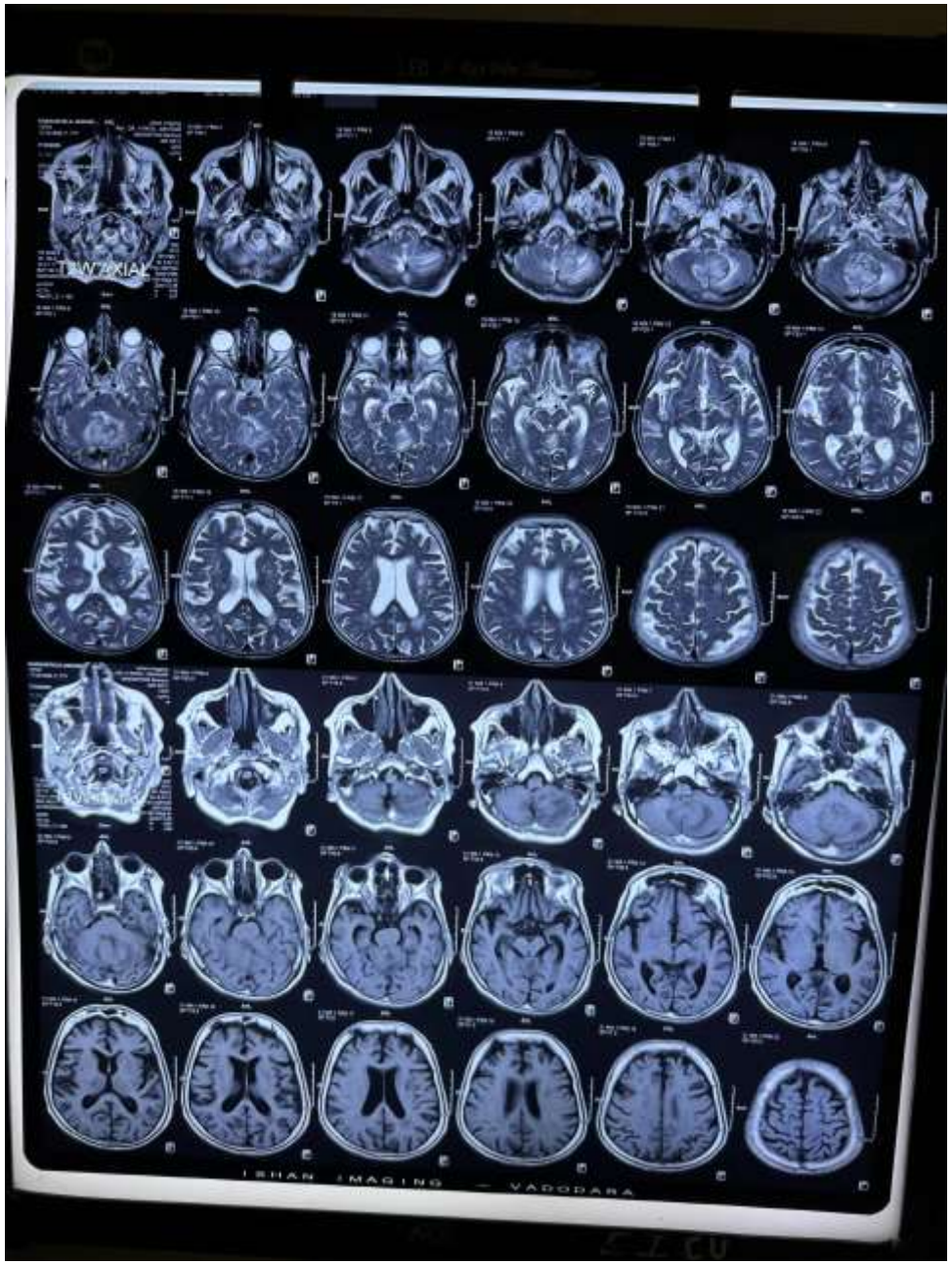
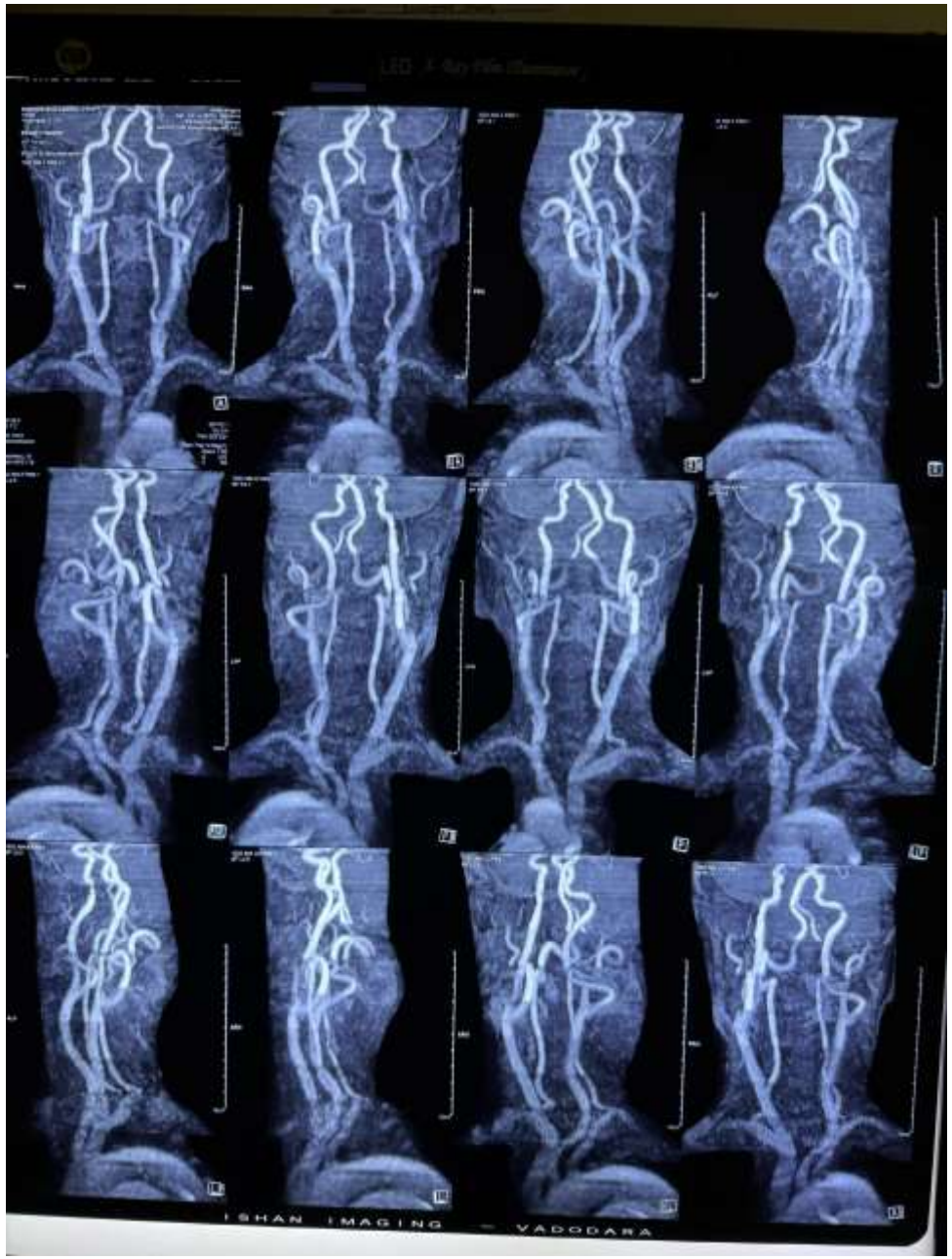

T2W AXIAL
ISHAN IMAGING — VADODARA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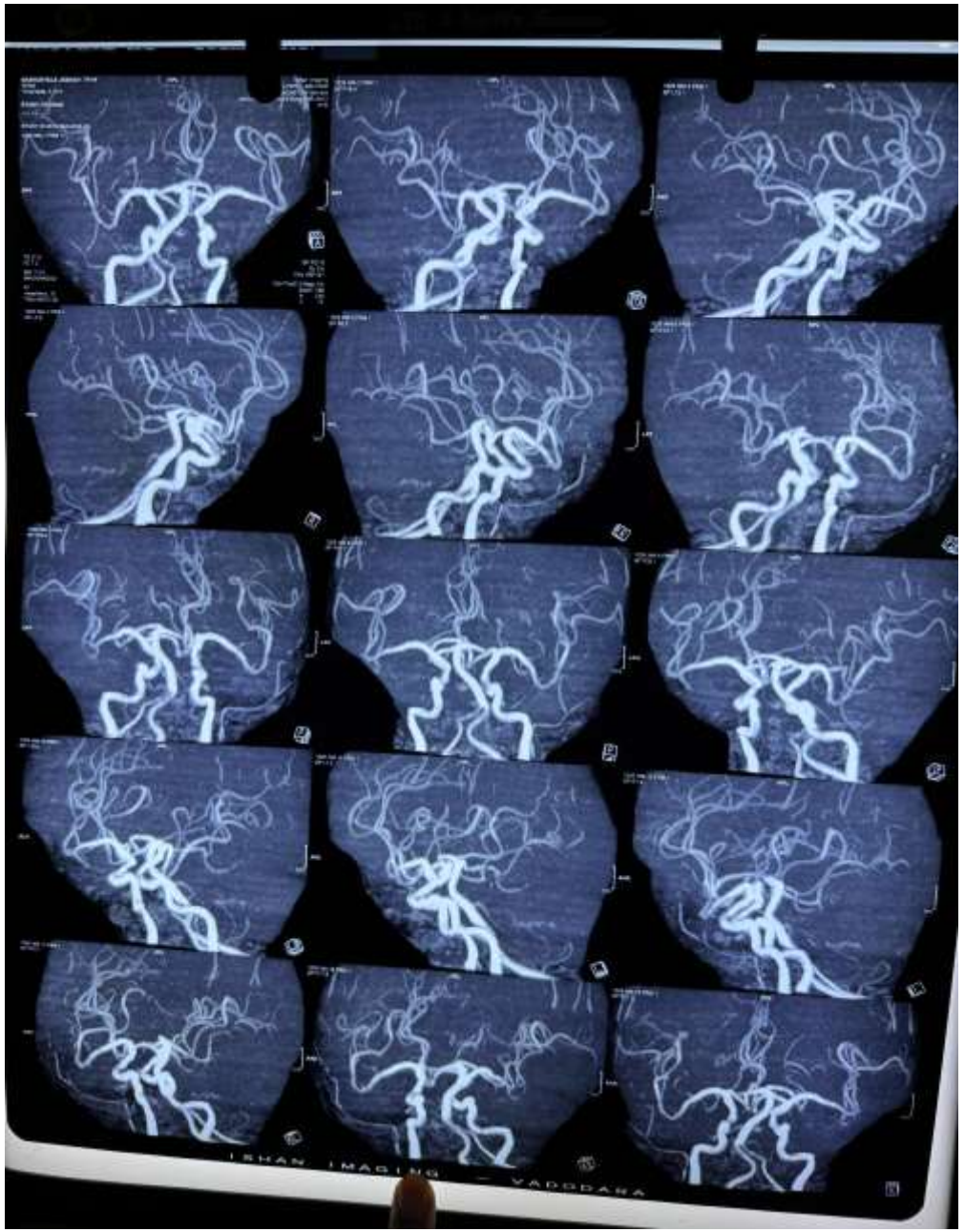
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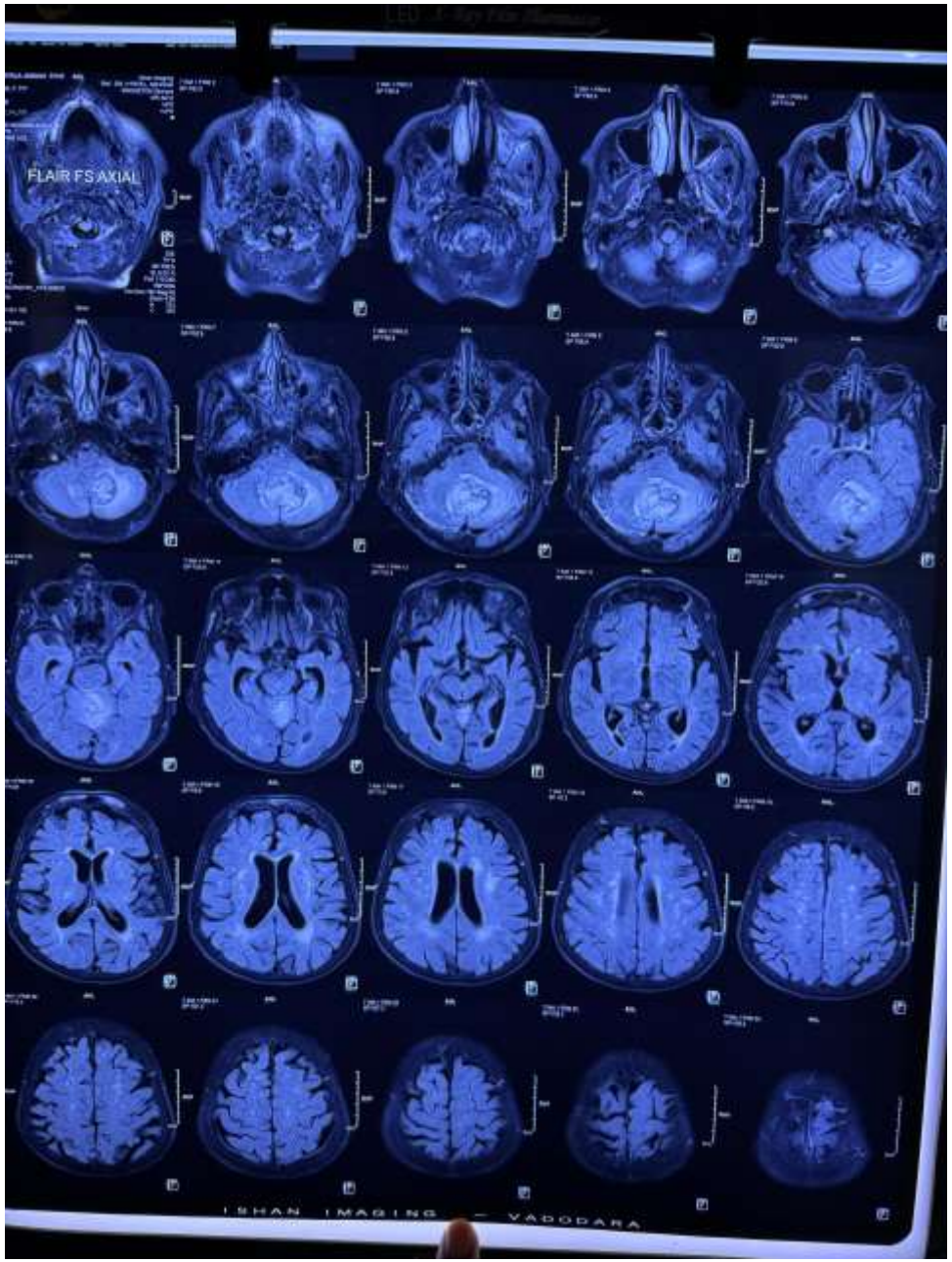
FLAIR FS AXIAL
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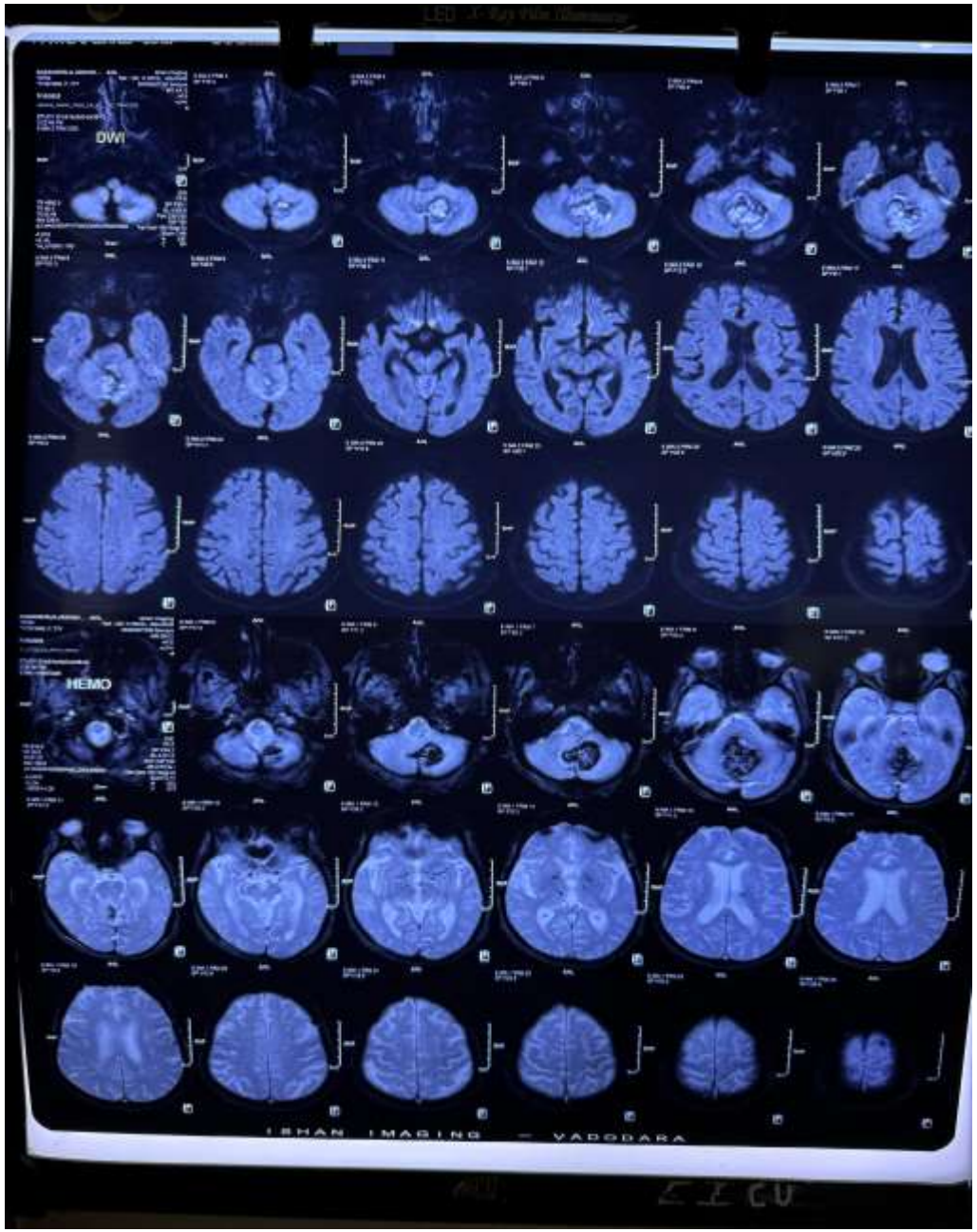

DWI
HEMO
ISHAN IMAGING – VADODARA

- Case 2 :
- 19 year old male patient was admitted to PSH with the complain of
- Tightening of all four limb and up-rolling of eyeball on the morning of 7 July 2025.
- Beathing difficulty on exertion since that morning .
- Patient had history of around 10 days of low grade fever , body ache , back pain
- Yellowish discoloration of eye and urine , abdominal pain since 3-4 days prior to the admission to our hospital .
- Vomiting one episode today morning
- Outside patient diagnosed as sickle cell crisis and two cycle of exchange transfusion were done .

- On arrival patient was conscious and oriented no any focal neurological deficit was present.
- Vital on arrival ;
- P-90 / min , RR-18/ min
- BP- 156/90 mmHg
- SpO2- 99% on Room air
- RBS - 170 mg/dL
- Pallor in palpebral conjunctiva present and sclera icterus present.

Alimentary system: Liver and spleen palpable, generalised vague tenderness

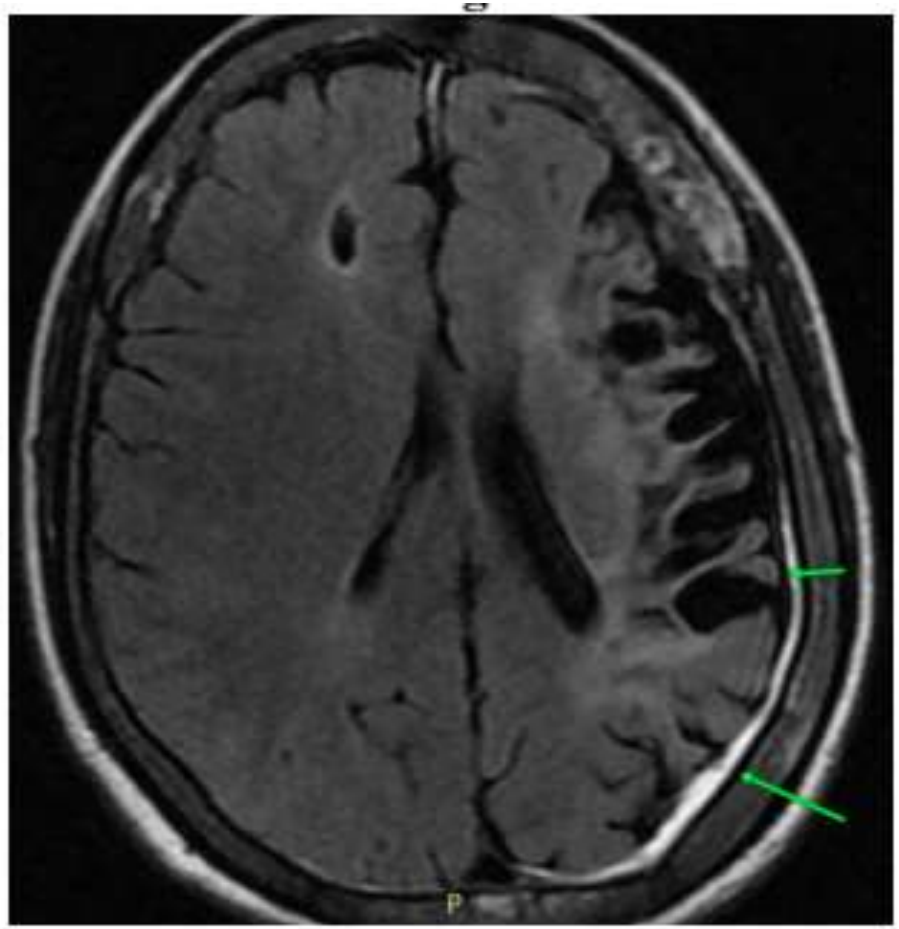
CVS examination: clinically NAD

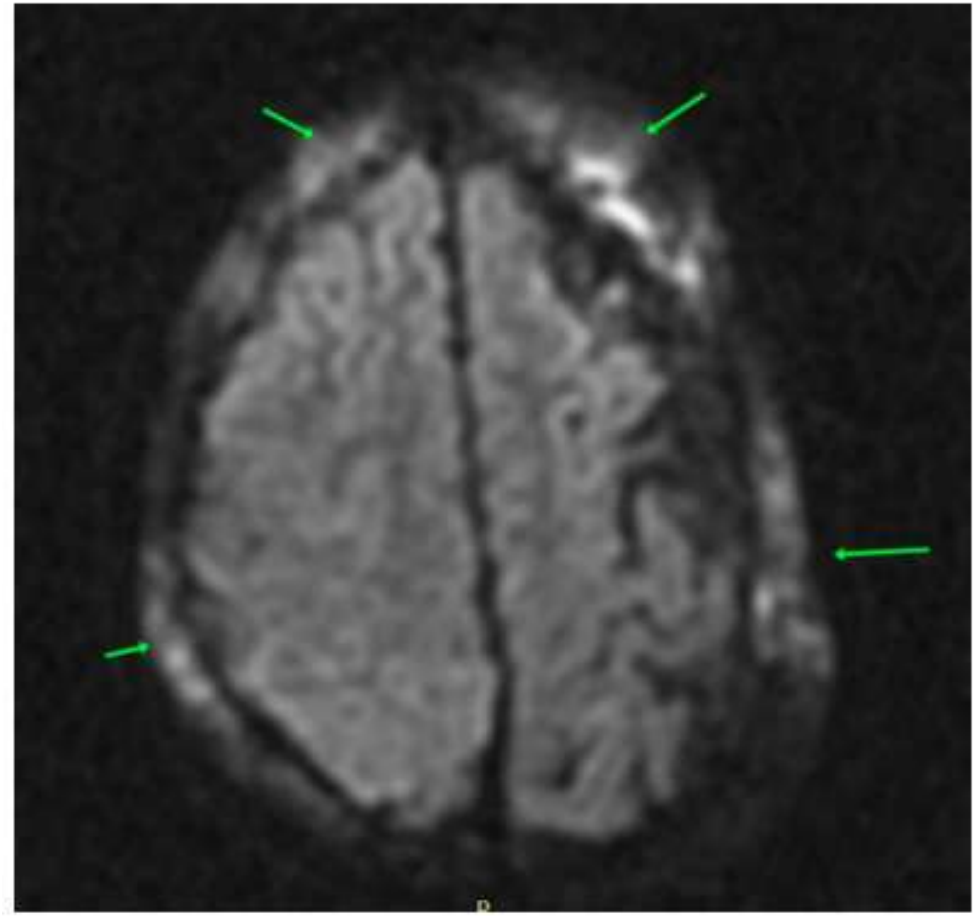
Respiratory examination: clinically NAD

CNS examination: no focal neurological deficits noted

- Investigation on day of admission :
- HB-7.1 , TC-26000 , platelets -1,68,000
- PT/aPTT- 12.5 / 23.5
- HHH – Negative
- Na+ 131 - , K+ - 5.0 , Chloride - 98 , Creatinine – 0.5 , Ca+2 – 8.9 , Mg+2 - 1.9 , Urea - 28
- LFT – Total bilirubin – 9.0, direct – 3.5 , indirect – 5.5
- SGOT- 191 , SGPT- 57 , Total proteins – 9 , Albumin – 4.8 , ALP- 420
- Uric acid – 7.3 , retic count - 8.5 , CRP – 112 , PCT - 2.52
- HB electrophoresis – HBs -53.9 % , HBf- 7.3 %, HBA0 – 33.8 %
- Malaria parasite – negative , Widal test - negative

- Probable differential diagnosis :
- 1. Acute infection leading to sickle cell crisis
- 2. Meningoencephalitis vs encephalitis
- 3. Acute CVA





MRI BRAIN REPORT (8/7/2025)

OBSERVATIONS:

Fairly large area of encephalomalacia with surrounding gliotic changes is present in left frontoparietotemporal lobe with resultant volume loss and ex vacuo dilatation of left lateral ventricle. Wallerian degeneration of left cerebral peducle is observed.

Thin strip of late subacute subdural hemorrhage is present along left cerebral convexity having maximum thickness of 3.4 mm toward left parietal lobe. This subdural hemorrhage also extends along interhemispheric falx.

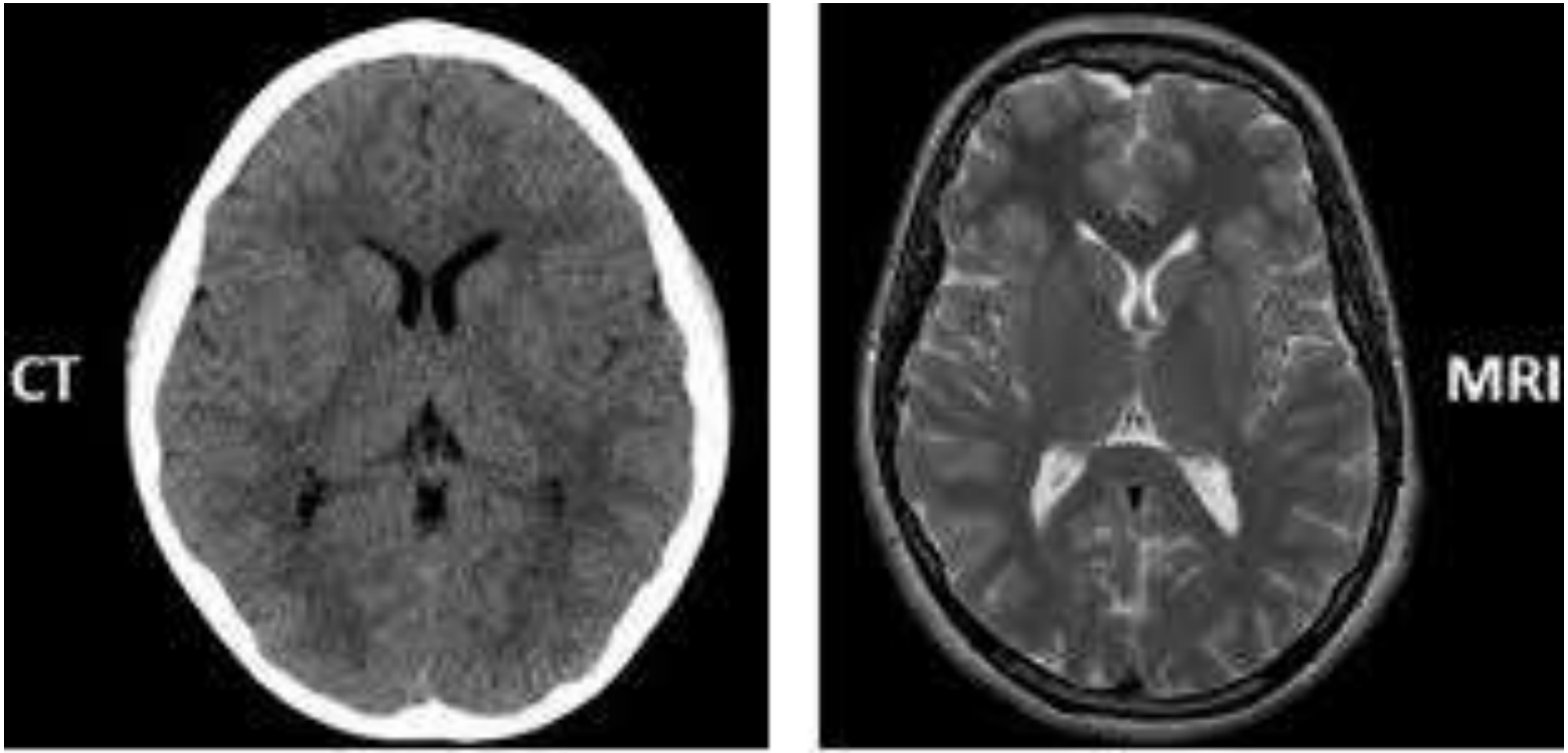
Chronic lacunar infarct is also noted involving right frontal deep white matter .
Diffuse thickening of calvarium is present, suspicious changes of underlying sickle cell anaemia.
Multiple patchy areas of restricted diffusion with corresponding low ADC value and associated T1, T2 and FLAIR hyperintense signals in bilateral fronto-parietal bone and left occipital bone which raise suspicion of calvarial infarcts.

No mass effect or midline shift in current scan.
Rest of the supratentorial and infratentorial brain parenchyma appears normal.
No shift of midline structures is seen.
Ventricles, cisterns and sulci appear unremarkable.
Intracranial vessels and dural sinuses display the expected flow void.
The craniovertebral junction is unremarkable.
Visualised paranasal sinuses appears normal.

CONCLUSION:

- **Fairly large area of encephalomalacia with surrounding gliotic changes present in left frontoparietotemporal lobe associated with Wallerian degeneration of left cerebral peducle . ---- sequalae of old infarction.**
- **Thin strip of late subacute subdural hemorrhage is present along left cerebral convexityextending into interhemispheric falx.**
- **Chronic lacunar infarct nvolving right frontal deep white matter .**
- **Diffuse thickening of calvarium is present, suspicious changes of underlying sickle cell anaemia.**
- **Multiple patchy areas of restricted diffusion with corresponding low ADC value and associated T1, T2 and FLAIR hyperintense signals in bilateral fronto-parietal bone and left occipital bone which raise suspicion of calvarial infarcts.**
- **No mass effect or midline shift in current scan.**

Use Case	Preferred Modality	Reason
Acute trauma/stroke	CT	Fast, sensitive for acute blood
Chronic hemorrhage	MRI	Better at detecting old bleeds
Microbleeds (e.g., amyloid angiopathy)	MRI (SWI/GRE)	High sensitivity
Hemorrhagic transformation in stroke	MRI	Can detect early and subtle changes
SAH missed on CT	MRI (FLAIR)	Detects residual blood in subarachnoid space



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Blood product signals change with time, except for T2*W sequences which remain profoundly hypointense. The typical signal patterns of ageing blood are as follows:

	Hyperacute <24 hours	Acute 1-3 days	Early subacute 3-7 days	Chronic subacute 8-14 days	Chronic >14 days
T1 weighted images	Iso	Iso	Hyper	Hyper	Hypo
T2 weighted images	Hyper	Hypo	Hypo	Hyper	Hypo
Blood type	OxyHb	DeoxyHb	Intracellular MetHb	Extracellular MetHb	Haemosiderin

Type	CT Finding	MRI Finding
Epidural Hematoma	Biconvex, lens-shaped hyperdensity	Variable; often missed unless large
Subdural Hematoma	Crescent-shaped hyperdensity (acute) or hypodensity (chronic)	Clear layering; age staging with signal characteristics
Subarachnoid Hemorrhage (SAH)	Hyperdensity in cisterns & sulci	Fluid-attenuated inversion recovery (FLAIR) & GRE/SWI helpful
Intraparenchymal Hemorrhage	Hyperdense area with mass effect	Age staging better with MRI; edema & hemorrhagic transformation seen
Cerebral Microbleeds	May be missed	Best seen on GRE/SWI sequences

1. Acute Haemorrhage (0–3 days)

- Appearance: Hyperdense (bright white) compared to brain tissue
- Best visualized in:
  - Intraparenchymal haemorrhage
  - Subarachnoid haemorrhage in cisterns/sulci
  - Epidural & subdural hematomas

2. Subacute Haemorrhage (4–14 days)

- Density begins to decrease; iso dense with brain tissue
- More difficult to detect

3. Chronic Haemorrhage (>2–3 weeks)

- Hypodense (dark) due to haemoglobin breakdown and fluid reabsorption

Thank You