CEREBRAL VENOUS THROMBOSIS - THE FORGOTTEN HEADACHE

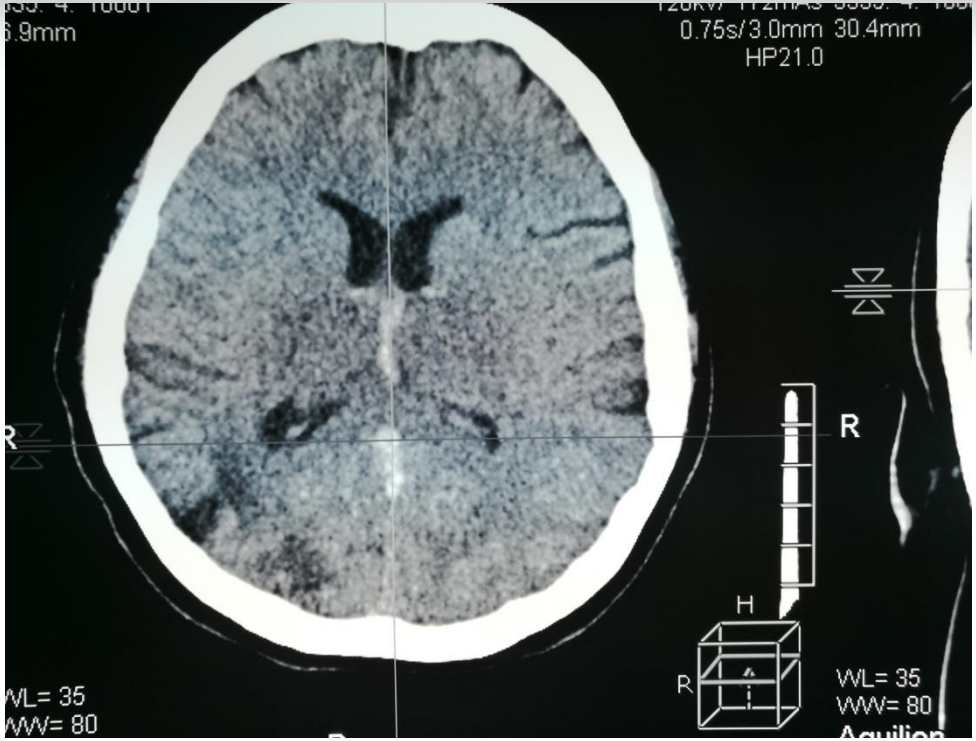
13 MAY 2017

CASE 1

- 48 Malay Lady
- Presented with bilateral LL weakness, difficulty in sitting up x 2/7 PTA
- Clinically Mild left hemiparesis

- Further Hx (not asked initially)
- Headache x 2/52 – unresolved with analgesics

Non enhanced CT



CASE 2

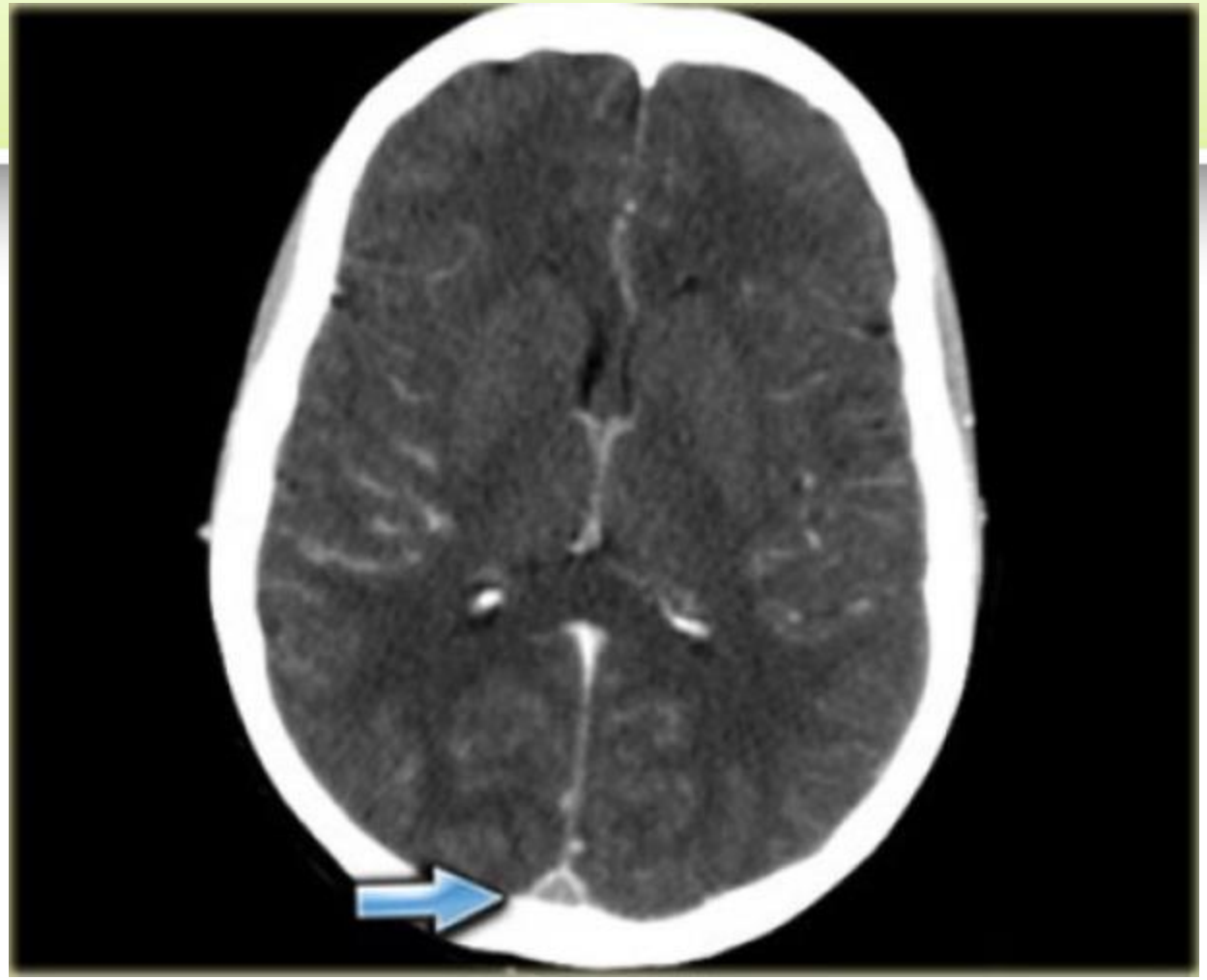
- 36 Myanmarese lady G4P3 @ 33/40
- Severe Headache x 1/52
- Described as waking up from sleep.
- Associated photophobia and vomiting
- No Neurological deficit
- Funduscopy not performed

- Given analgesics
- No Urgent CT Brain
- Neuromedical appointment in 4/52
- Patient stopped breathing on Day 5 of admission.

Case 3

- 48/malay/lady
- Diagnosed as Very Severe Aplastic Anemia after 3/52 of persistent pancytopaenia
- No allomatch siblings. No MMDR allo match. Cant afford international MUD
- Awaiting ATGAM therapy

- Developed severe headache and photophobia x 1/52 following severe upper airway infections
- Vomitted once at home
- No neurological deficit, tender paranasal sinus



HISTORICAL PERSPECTIVE

- 1825: Ribes – severe headache/epilepsy
- 1828: Abercrombie – puerperal headache/seizures
- 2004: ISCVT – Stroke 634 pts
- 2012: Italian Registry – 706 pts

EPIDEMIOLOGY

- Incidence varies from 0.22/100,000 to 1.23/100,000
- 11.6/100,000 among pregnant ladies
- More common in women than men (3:1)
- Diagnosis is frequently delayed

Risk Factors

- Infections
- Drugs – OCP/HRT
- Prothrombotic States
- Malignancy
- Inflammatory diseases
- Trauma

Pregnancy and thrombosis

- Hypercoagulability in pregnancy might be an evolutionary mechanism to protect against post partum hemorrhage

(i) Increased Fibrinogen (~3x)

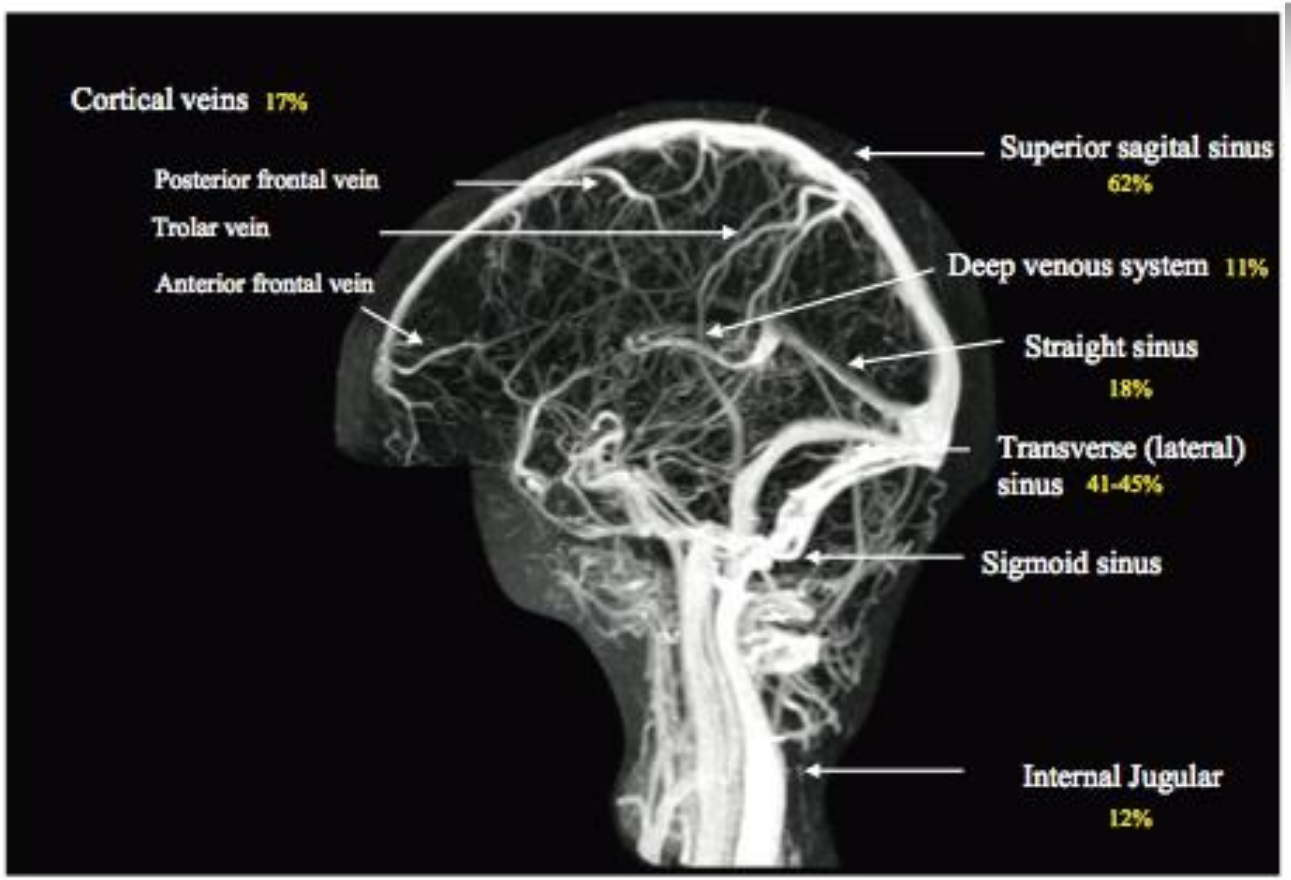
(ii) Increased Thrombin

(iii) Decreased Protein S

(iv) Increased Plasminogen Activator Inhibitor-I

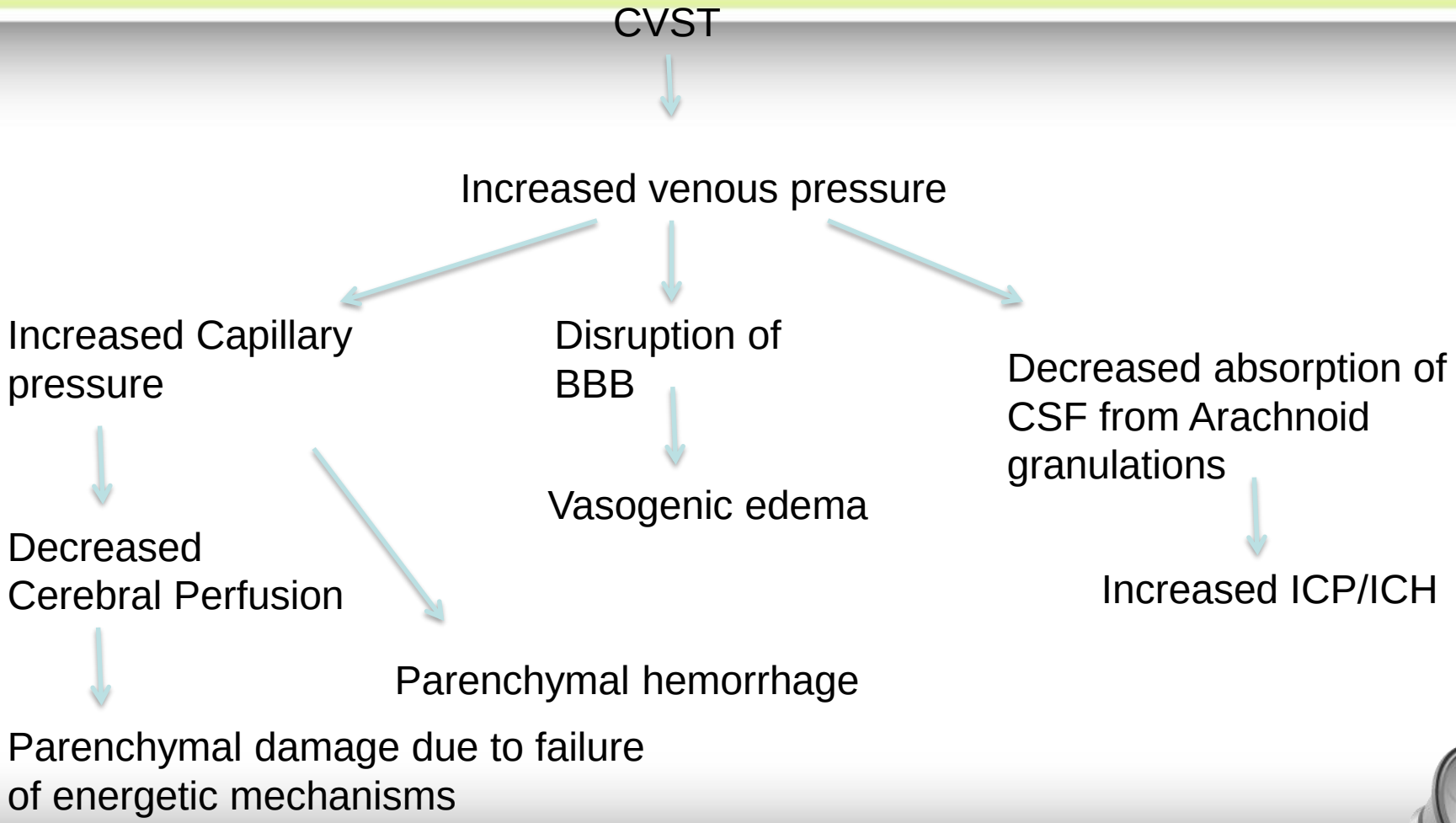
(v) Venous stasis due to increased compliance of vessel walls

Common choke points



Courtesy: Saponsik et al. (2011)

Mechanisms of injury



Clinical Presentation

- Three Major groups of symptoms

(i) Intracranial hypertension

(ii) Focal deficits

(iii) Encephalopathy

Intracranial hypertension

- Most Common Symptom: headache
- Can be the only symptom and precede others by weeks or days
- Location does not correlate with that of thrombosis
- Variable in onset
- Papilledema, N/V, visual symptoms may or may not be present

Focal deficits

- Usually hemiparesis
- Rarely sensation and vision loss
- Focal seizures

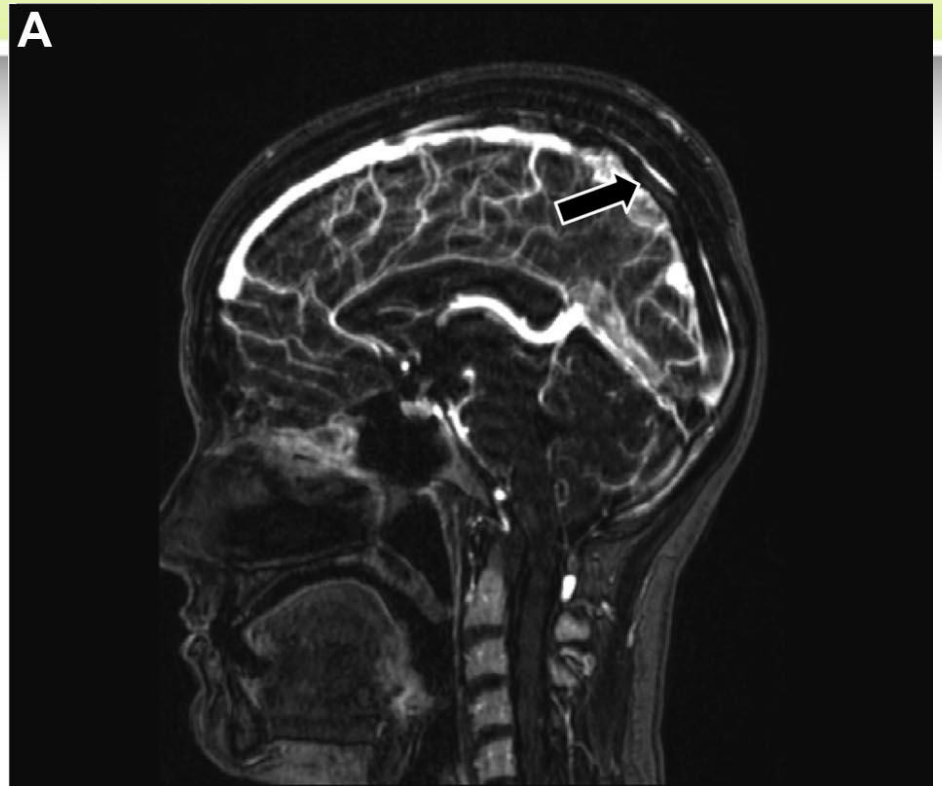
Encephalopathy

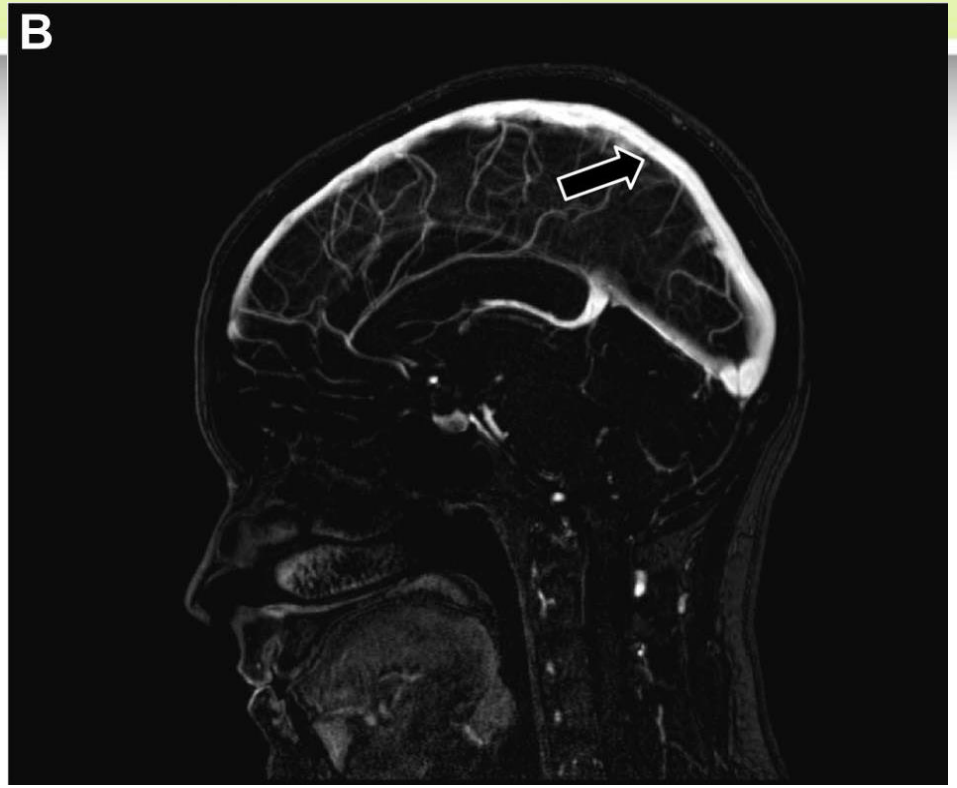
- Delirium
- Apathy
- Frontal lobe signs
- Stupor
- Seizures
- Multifocal deficits

Imaging

- MRI (T2) and MRV are best
- 1st week(deoxyHb): T1- iso; T2- hypointense
- 2nd week (methHb): Hyper in both modalities
- If MRI is unavailable, try CT and CTV
- CVT appears as hyperdensity in CT
- Cerebral angiography if MRV and CTV are inconclusive

MRV imaging

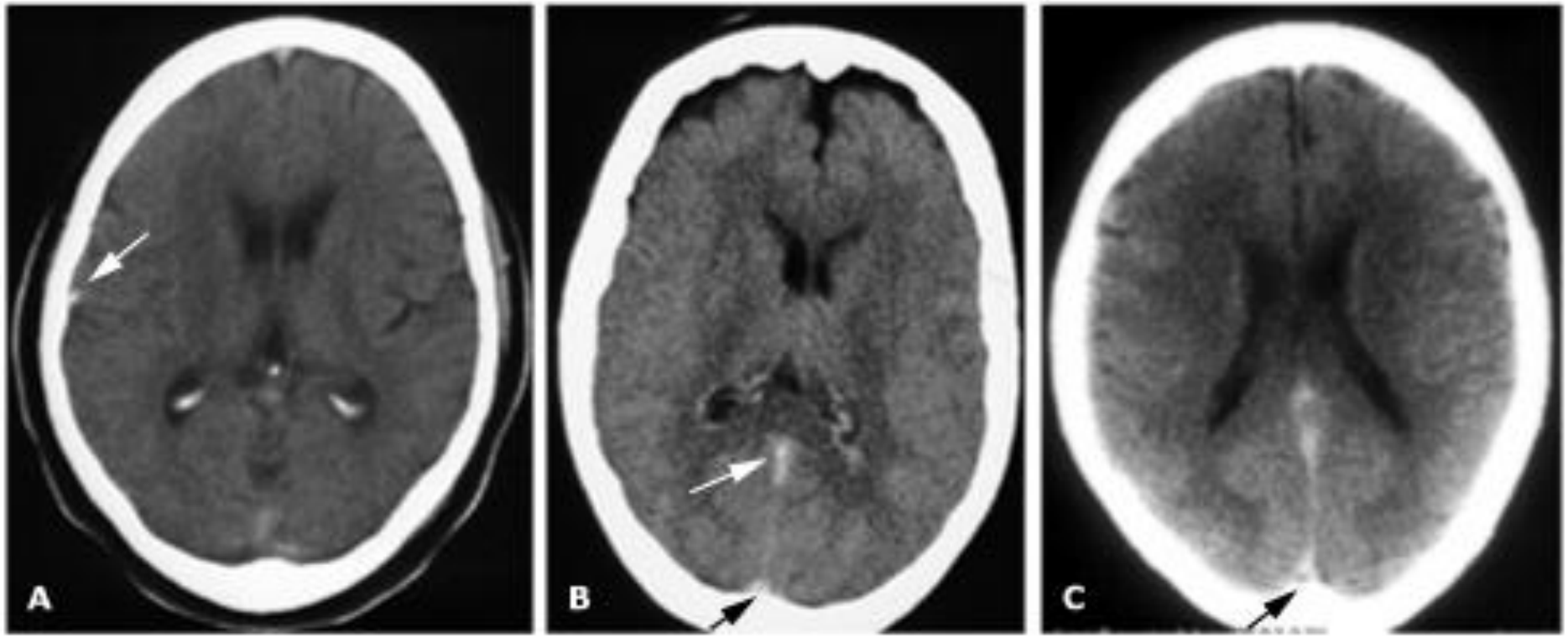




2 days s/p acute onset

1 year f/u with oral anticoagulant therapy

Courtesy: Saponsik et al. (2011)



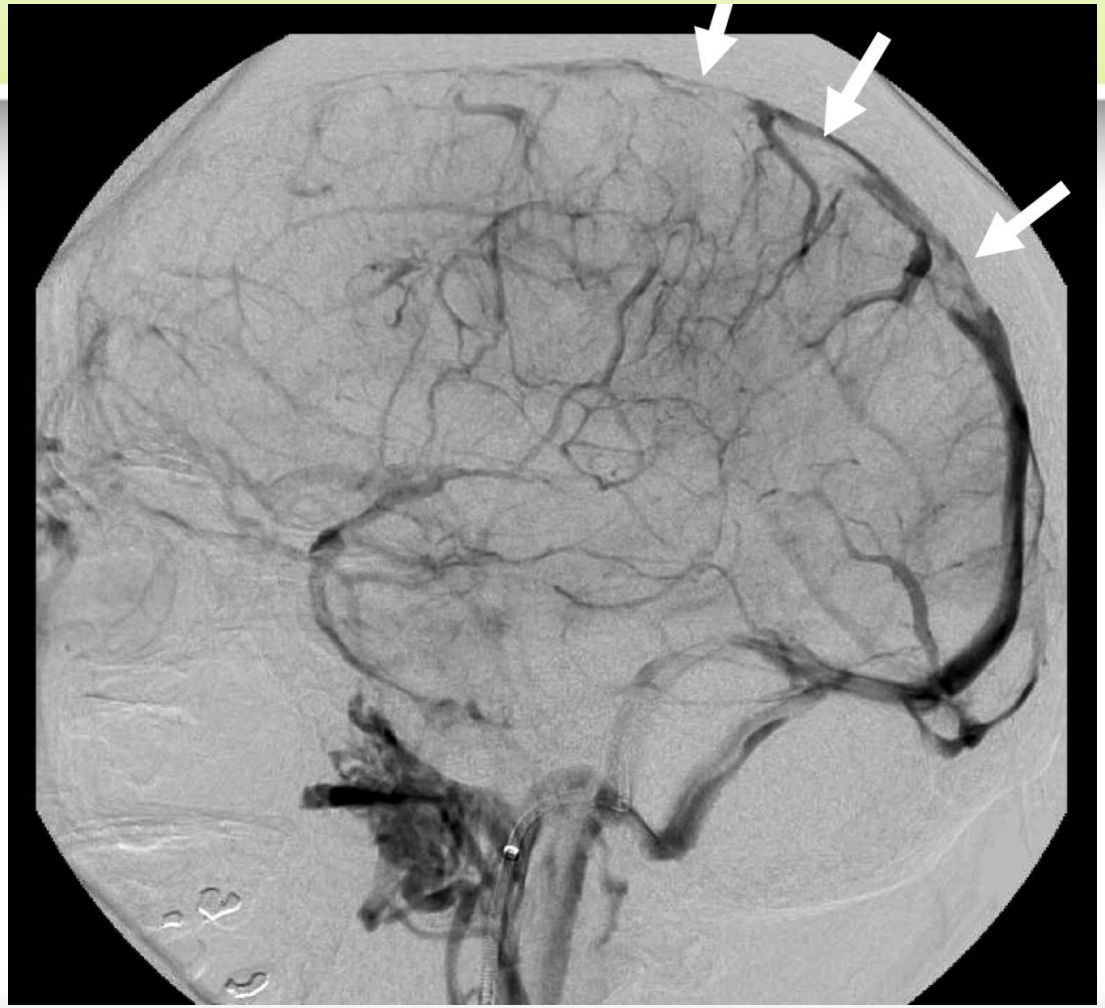
Acute Non contrast CT: Hyperdensity in cortical vein

Courtesy: Uptodate.com

Non contrast CT: Hyperdensity in torculae and the straight sinus– dense triangle sign

Contrast CT: Unfilled confluence of sinuses after contrast injection– the empty delta sign

Cerebral angiography



Courtesy: Saponsik et al. (2011)

LABORATORY

- D – dimer
- Mean sensitivity is 94%
- In underlying chronic headache, sensitivity lower 84%
- AHA guideline: *If there is a strong clinical suspicion of CVT, a normal D-dimer level should not preclude further evaluation.”*

- -*J of Thrombosis: Haemostasis 2012; 10:582-9: Metaanalysis and Systemic review*

Treatment

Central Venous Thrombosis

- Recanalization of occluded veins
- Prevent the propagation of the thrombus
- Treat the underlying thrombophilia

Stop offending drugs such as oral hormones

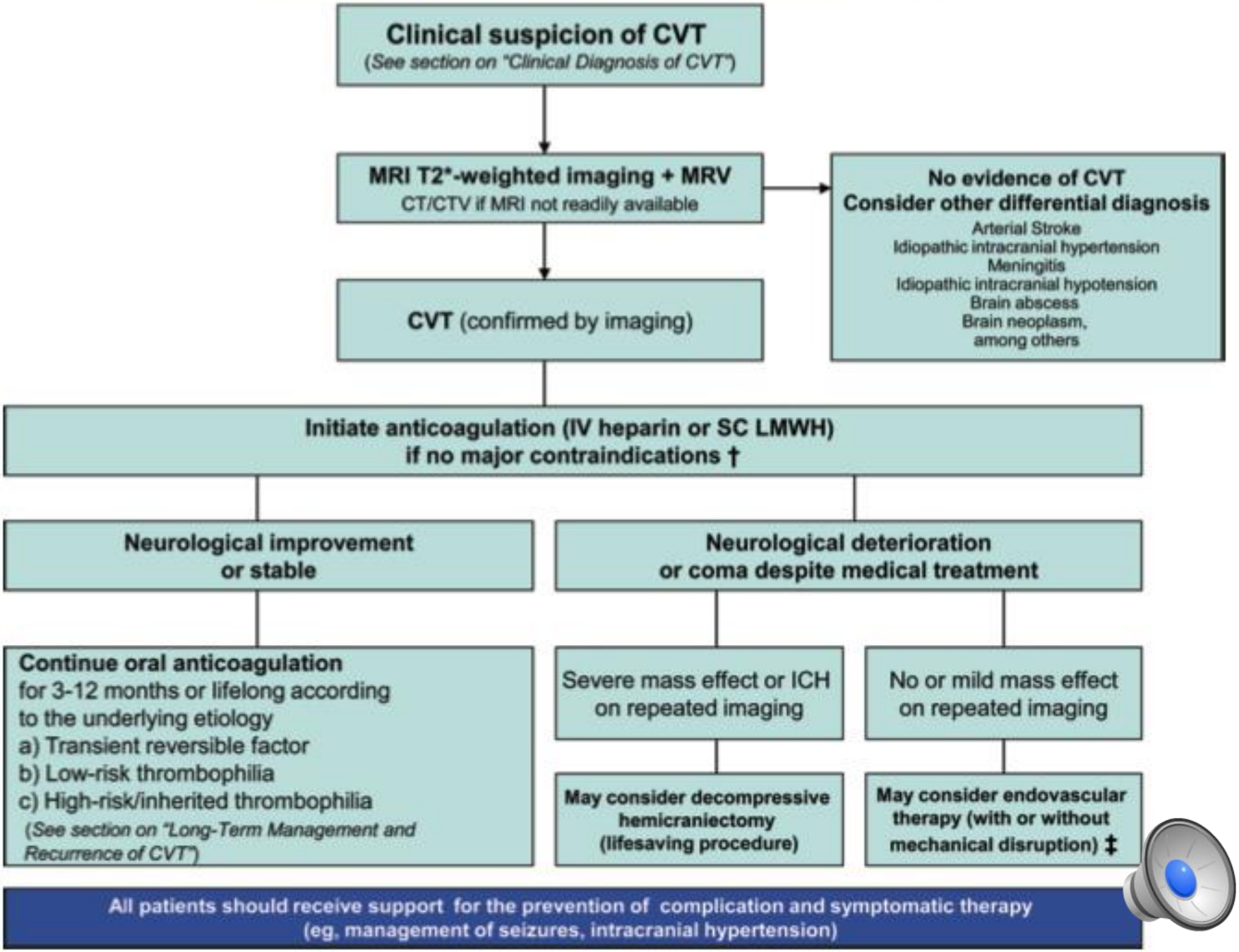
AHA, ACCP, EFNS all support anticoagulation with LMWH or Unfractionated Heparin

In severe cases, can also try mechanical thrombolysis or intra-sinus delivery of rtPA or urokinase using a catheter

Clinical Pearls for Diagnosis and Management of Cerebral Venous Thrombosis - AHA 2012

Imaging with MR venography or CT should be performed in patients with suspected cerebral venous thrombosis.
Because of the high frequency of thrombophilias among patients who develop cerebral venous thrombosis, screening for hypercoagulable conditions should be performed.
On the basis of data from randomized controlled trials and observational studies, anticoagulation is recommended as safe and effective for treatment of cerebral venous thrombosis.
Anticoagulation with an oral vitamin K antagonist and a target international normalized ratio of 2.0–3.0 is recommended for 3–6 mo in patients with provoked cerebral venous thrombosis and 6–12 mo in those with unprovoked cerebral venous thrombosis.
Patients with recurrent cerebral venous thrombosis, deep vein thrombosis, or pulmonary embolism complicating cerebral venous thrombosis or initial cerebral venous thrombosis in the setting of severe thrombophilia should be considered for indefinite-duration anticoagulation.
Women who have suffered cerebral venous thrombosis in the setting of hormonal contraceptive therapy should seek alternative non–estrogen-based methods for contraception.

Proposed Algorithm for the Management of CVT



Decompressive surgery

- Large venous haemorrhagic infarction
- At risk of brain displacement and transtentorial or subfalcine herniation

Fibrinolytic

- An Italian systematic review of 169 patients with cerebral venous thrombosis: a possible clinical benefit with fibrinolysis for those with a severe presentation. *(J of Neurosurgery 1993; 78:515-8)*
- ICH occurred in 17% of patients after fibrinolysis
- clinical deterioration in 5%.

- Another systematic review of 156 patients with cerebral venous thrombosis *(Stroke 2005; 36:1927-32)*
- 12 deaths after fibrinolysis
- 15 major bleeding complications, including 12 ICH.

- On the basis of the limited data available, catheter-directed fibrinolysis may be considered at experienced centers for patients who deteriorate despite intensive anticoagulation

DOAC

- Small case series – noninferior efficacy
- 50% approximate relative risk reduction of ICH

Treatment of Cerebral Venous Thrombosis with Rivaroxaban

Anticoli S*, Pezzella FR, Scifoni G, Ferrari C and Pozzessere C

Stroke Unit, Emergency Department, San Camillo Hospital, Rome, Italy

- RE-SPECT – phase III : Pradaxa vs VKA in CVT
- looking at safety and efficay of DOAC in CVT

Short term Prognosis

Predictors of mortality at 30 days

- Altered mental status
- Thrombosis of deep veins
- Posterior fossa lesions

Long term Prognosis

- CNS infection
- Malignancy
- Thrombosis of deep veins
- Hemorrhage
- GCS<9
- Age>37
- Male gender

THANK YOU