

Hypertensive Haemorrhagic Stroke

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Intracerebral Haemorrhage

■ Primary ICH

- Spontaneous rupture of small vessels damaged by HBP – Basal ganglia, thalamus, pons and cerebellum
- Amyloid angiopathy – Amyloid deposits in walls of small arteries

■ Risk Factors:

- Uncontrolled Hypertension
- Modifiable – Primary Prevention Important

■ Secondary ICH:

- Vascular malformations, Tumours, Anticoagulants, Etc

Targets for BP Control

■ In the past

- 140/90

■ Now

- 130/80

- Age <60
- Diabetic
- Renal Impairment

- 140/90 if Age > 60

Control Hypertension

- Prescribe recommended dosage if possible
- Drug combinations often required
 - Up to 3 - 4 classes of antihypertensives
- Fixed dose combinations exist and help compliance

Assessment of Risks

■ CHA₂DS₂ –VASc Scoring System:

- To assess risk of thromboembolic stroke in Non-rheumatic Atrial Fibrillation
- Hypertension – BP consistently > 140/90

■ HAS-BLED Scoring System:

- To assess risk of major bleeding in Non-rheumatic Atrial Fibrillation
- Hypertension – Systolic >160 mm Hg

CHA₂DS₂-VASc

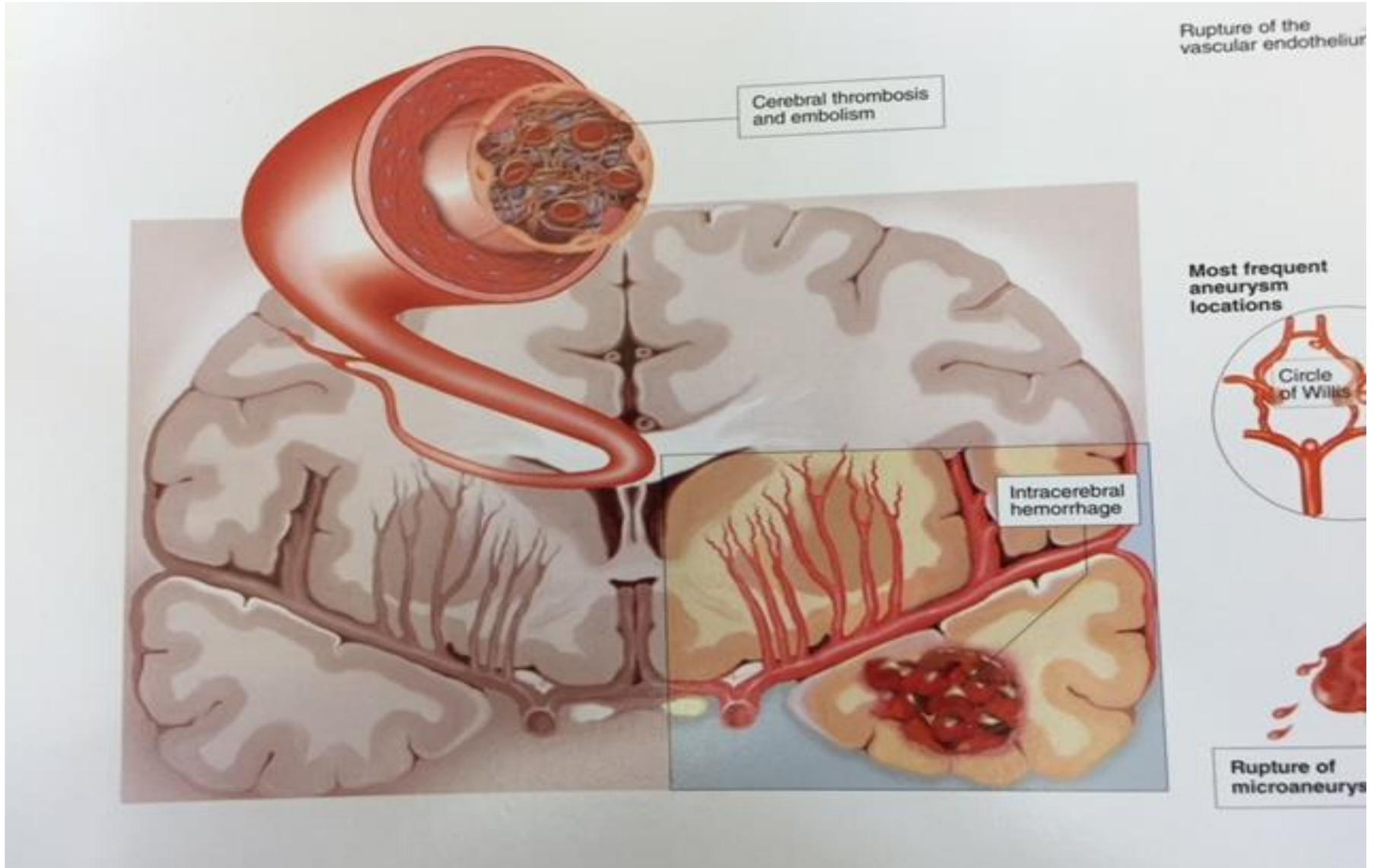
	Condition	Points
C	Congestive heart failure (or Left ventricular systolic dysfunction)	1
H	Hypertension : blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)	1
A₂	Age ≥75 years	2
D	Diabetes Mellitus	1
S₂	Prior Stroke or TIA or thromboembolism	2
V	Vascular disease (e.g. peripheral artery disease, myocardial infarc-	1

	Condition	Points
H	Hypertension: (uncontrolled, >160 mmHg systolic)	1
A	Abnormal renal function: Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L	1
	Abnormal liver function: Cirrhosis or Bilirubin >2x Normal or AST/ALT/AP >3x Normal	1
S	Stroke: Prior history of stroke	1
B	Bleeding: Prior Major Bleeding or Predisposition to Bleeding	1
L	Labile INR: (Unstable/high INR), Time in Therapeutic Range <60%	1
E	Elderly: Age > 65 years	1

Uncontrolled HBP

- Atherosclerosis
- Atrial Fibrillation
- Intracerebral Bleed

Uncontrolled BP



Hypertensive Bleed

■ Uncontrolled Hypertension:

- Lipohyalinosis of perforating arteries

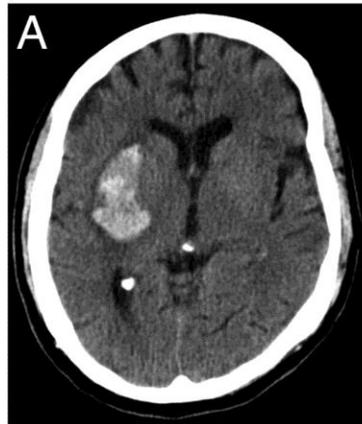
■ Characteristic Locations

- Basal ganglia,
- Thalamus
- Pons and
- Cerebellum

■ Deep Haemorrhages

- May extend into ventricles
- Hydrocephalus

Typical locations of hypertensive ICH are Putamen (A), Thalamus (B), Subcortical white matter (C), Pons (D) and Cerebellum (E).



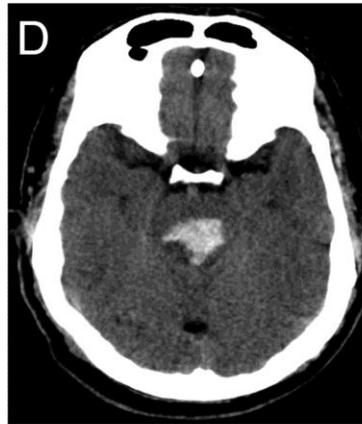
Putamen



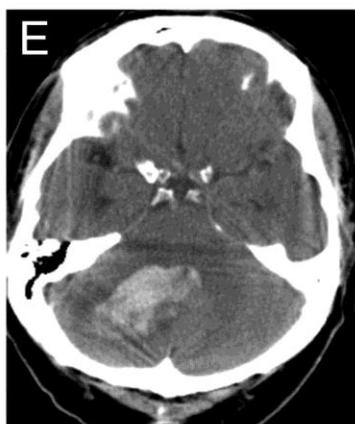
Thalamus



Subcortical



Pons



Cerebellum



Temporal lobe

Patient A

■ When do we do the CT-Scan?

- The earlier the better
- Stabilise patient first
- Airway Breathing Circulation

■ Patient is “stable”

- GCS 15/15
- It is Midnight
- Do we need to call the on-call technician / Radiologist?

ICH is a Medical Emergency

- Brain Scan to distinguish between Infarct, Haemorrhage & Others

- In case of ICH
 - 15-23 % of patients have Haematoma expansion and Neurological decline in the first several hours

 - >20% of patients experience a decrease of 2 or more points in their GCS after initial assessment in Casualty

CT Brain Scan

- CT Brain Scan is highly sensitive and specific for ICH
 - Location
 - How big?
 - Any mass effect?
 - Intraventricular extension?
 - Hydrocephalus?
 - Signs of herniation

iDose (3)

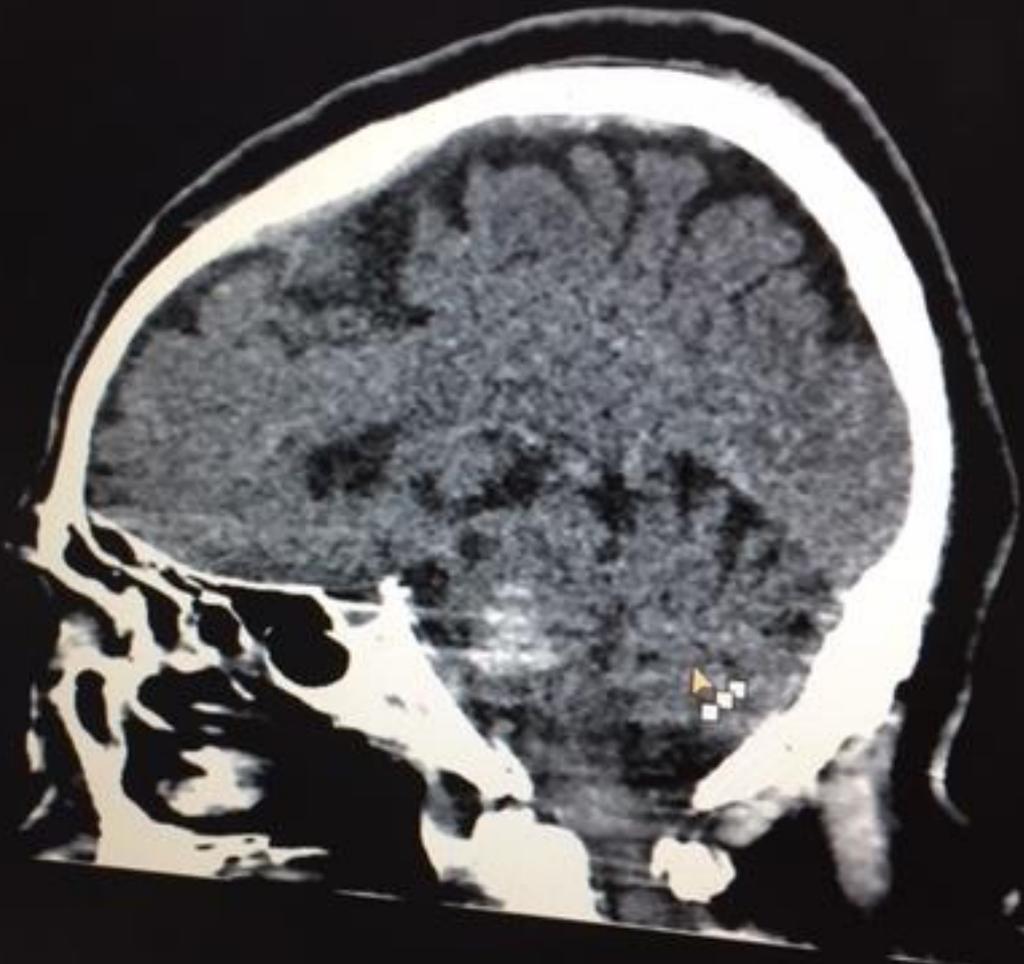
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Thickne



E ST

A



Average

Patient A

- Management of Hypertension
- Reversal of Coagulopathies
- Glucose Control
- Seizure Prophylaxis
- Treatment of Cerebral Oedema (Perihaematoma)
- DVT prophylaxis
- Surgical treatment

Control of HBP

- Elevated SBP is associated with Haematoma Expansion
 - Haematoma Expansion
 - Neurological Deterioration
 - Poor outcome
- Nicardipine iv infusion 5-15 mg/hr
- But Concern about perihaematomal ischemia
 - ? SBP < 180
 - ? SBP < 160
 - ? SBP < 140

INTERACT-2 trial

- N Engl J Med 2013; 368:2355-2365

- Rapid Blood-Pressure Lowering in Patients with Acute Intracerebral Hemorrhage
 - 2839 patients randomised.
 - 2 arms SBP < 180 or SBP < 140 mm Hg
 - Primary Outcome was Death or Major Disability at 90 days
 - Score of 3 to 6 on the modified Rankin scale
 - Score of 0 indicates no symptoms
 - Score of 5 indicates severe disability
 - Score of 6 indicates death at 90 days.
 - Primary outcome could be determined in 2794 patients

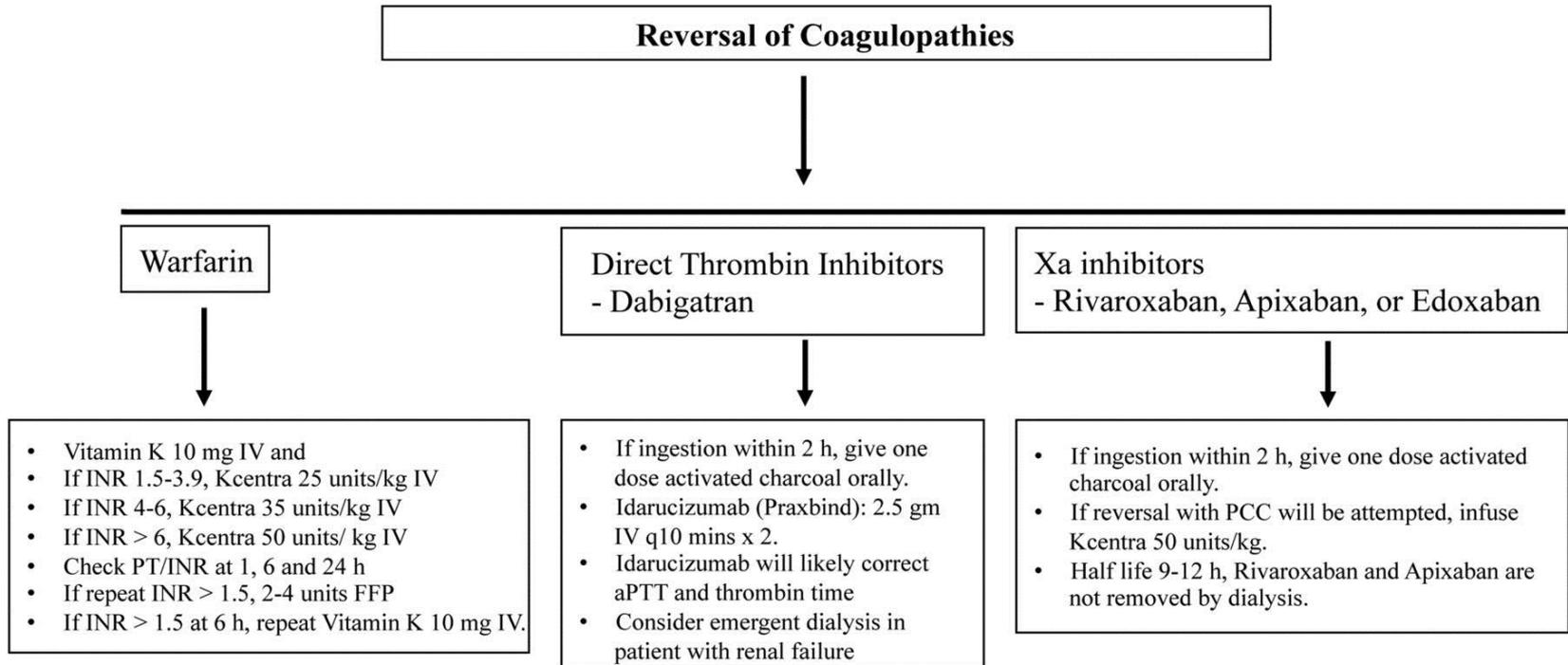
INTERACT-2 trial

- Mortality was same in both groups
 - 11.9% in the group SBP < 140 mm Hg
 - 12.0% in the group SBP < 180 mm Hg
- Nonfatal serious adverse events same in both groups
 - 23.3% in the group SBP < 140 mm Hg
 - 23.6% in the group SBP < 180 mm Hg
- Better Functional Outcomes in SBP < 140 mm Hg

ATACH-2 trial

- What about patient presenting with BP > 220 mm Hg
 - Less Aggressive
 - Go slower
 - Arterial line placement recommended
- Aim for Systolic of 160 mm Hg

Reversing Warfarin and NOAC coagulopathies



Glucose Management

- Hyperglycaemia on admission associated with worse morbidity and mortality independent of presence of DM
- Continuous Soluble Insulin Infusion via Syringe pump
- Keep Blood Sugar between 6 to 8 mmol/l

Management of Perihaematoma Oedema (PHE)

- PE develops within the first few days after ICH
 - Elevated ICP
 - Mass Effect
 - Midline Shift
 - Brain Herniation
- Mannitol – Osmotic Diuretic – Increases Water Excretion
- HTS – Increases plasma osmolarity
 - Increases flow of excess water from cerebral tissue to blood via osmotic gradient
 - Preferred if dehydration and decreased urine output present

Thank You