



KANSAS INITIATIVE FOR
STROKE SURVIVAL
A PROJECT BY AND FOR KANSANS

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Overview of Acute Intracerebral Hemorrhage

“First Tuesdays” Lecture Series

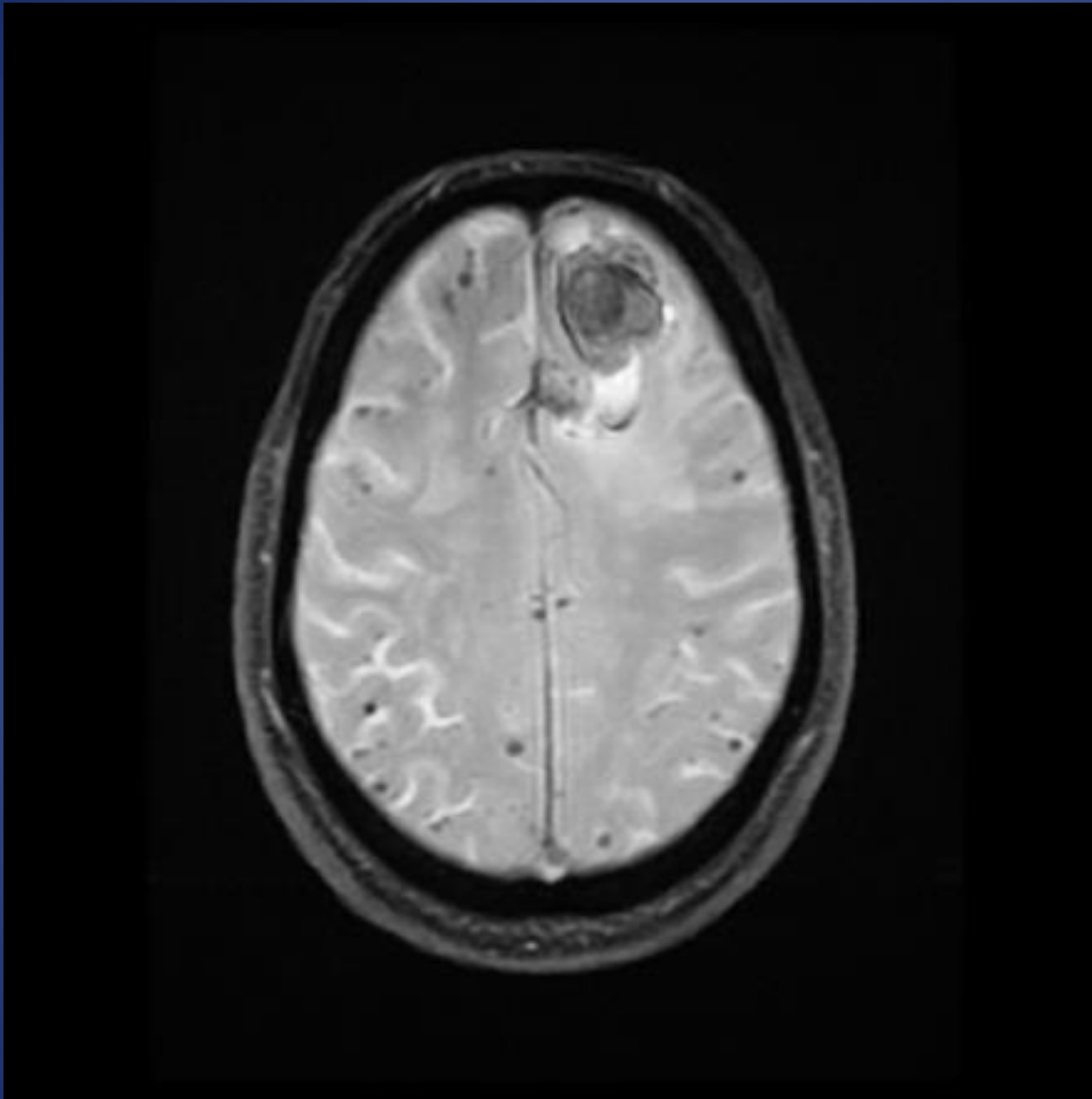
Introduction and Goal of “First Tuesdays”

- Sabreena Slavin MD – Vascular Neurologist and Neurohospitalist at KU School of Medicine
- Didactic lecture series as part of the Kansas Initiative for Stroke Survival
- Updates in Practice and FAQ’s on Acute Stroke Care
- 20 minute didactic, 10 minutes for questions/discussion.

Causes of ICH

- Traumatic: located in frontal or temporal poles, may have associated skull defect
- Hypertensive: located deep in basal ganglia/thalamus or in brainstem/cerebellum
- Amyloid angiopathy: located in lobes, may have microhemorrhages on MRI
- Anticoagulation-related
- Vascular malformations (aneurysms, AVM's): element of subarachnoid hemorrhage/intraventricular hemorrhage
- Ischemic stroke with hemorrhagic transformation: larger area of surrounding ischemia on MRI
- Brain metastasis: mass on imaging





Workup

- CBC and coagulation factors
- MRI brain
- CTA head
- +/- cerebral angiogram

Acute management

- Stabilize patient
- Call neurosurgery

Acute management: blood pressure

- INTERACT-2 trial¹: patients with acute spontaneous ICH randomized to BP < 140 vs BP < 160 within 6 hours. After adjustment of baseline ICH volume, no difference in ICH volume at 27 hours or mRS at 90 days.
- ATACH-2 trial²: patients with acute spontaneous ICH randomized to BP 110-139 vs 140-179 within 4.5 hours. No significant difference in groups of expansion on 24 hour CT or 90 day mRS, but with more adverse effects in the tight control group.
- Would plan to keep SBP less than 160 for most patients
- Caveat: if aneurysmal, keep SBP less than 140.

Acute management: anticoagulant reversal

- Give PCC (prothrombin complex concentrate)
- INCH trial: For ICH related to Vitamin K antagonists: PCC is better than FFP resulting in lower INRs, smaller hematomas at 24 hours, and less mortality (19% vs 35%)
- Can also use for direct inhibitors (eg: Apixaban)
- Idarucizumab (Praxbind): used to reverse Dabigatran (Pradaxa)
- Andexxa: used to reverse Apixaban (Eliquis) or Rivaroxaban (Xarelto)

Acute management: platelets?

- PATCH trial: For ICH related to antiplatelet therapy: Platelet transfusion led to higher risk of death/dependency at 3 months and with more adverse events during hospital stay.
- Do not give platelets

Surgical/interventional treatment

- EVD for patients at risk for hydrocephalus (eg: IVH)
- Craniotomy to evacuate hemorrhage/endoscopic aspiration can be done with smaller areas of hemorrhage
- Early surgery?
 - STICH trial: RCT of 1033 patients with supratentorial ICH: no significant difference overall between early surgery and early conservative management. There was a significant benefit in subgroup with ICH 1 cm or less from surface.
- In cases with aneurysms/AVM, cerebral angiogram to treat

Complications of ICH

- Elevated ICP/impending herniation: can cause unstable vitals (Cushing's triad: hypertension, bradycardia, irregular respirations)
- Seizures
- Expanding hemorrhage:
 - Between initial CT and 24-hour CT, 14% of 627 patients had enlarging ICH in one study - associated with earlier admission, increased ETOH consumption, irregular size of hematoma, IVH, altered consciousness, and lower fibrinogen level

Bottom Line

- ICH can worsen quickly: Stabilize patient and call NSGY asap
- Treat elevated BP to less than 160
- Get full list of medications from family (especially for anticoagulation agents)
- Once stable, further workup including CTA and MRI can help in diagnosis

Questions?

- Call for help anytime!
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