Baptist Health

Stroke Breakout Session

FOR YOU. FOR LIFE.

Playing Your Cards Right

Translational Practice

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Baptist Health Neurosurgery Arkansas
Baptist Health Neuroscience Symposium 2024

Objectives

- Define translational practice
- Discuss ways to incorporate translational practice into neuroscience nursing practice

Translational Practice

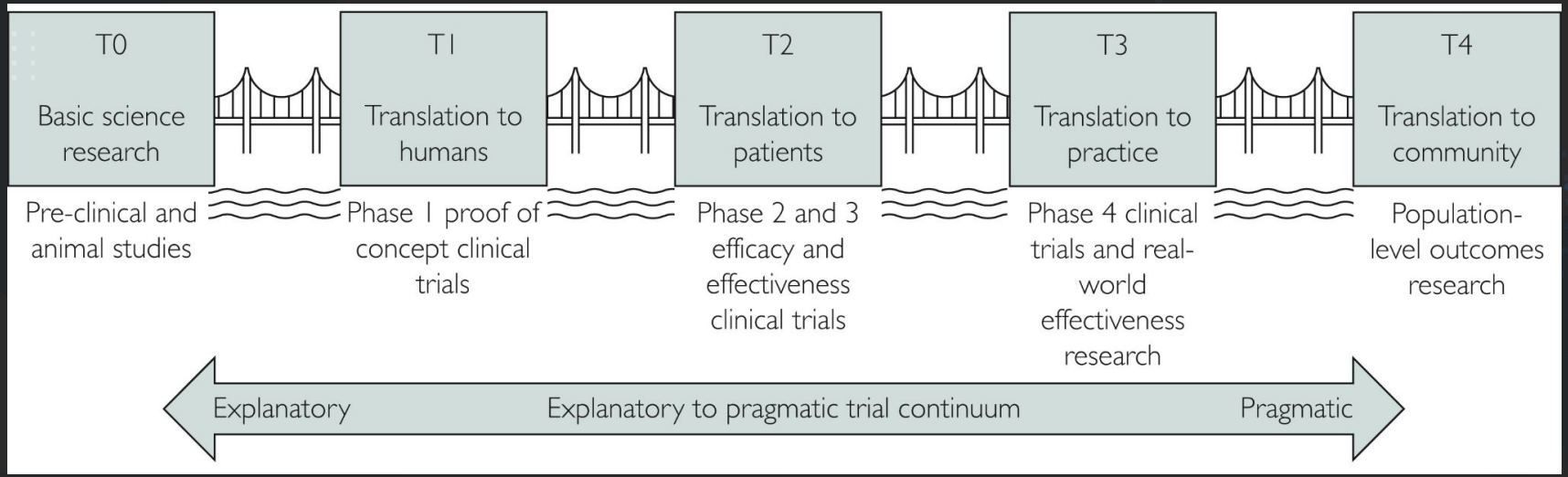
Translational Research

Dynamic continuum from basic research through application of research findings in practice, communities and public health settings to improve health and health outcomes

Requires knowledge translation, knowledge transfer and formulation of EBP

Did you know…

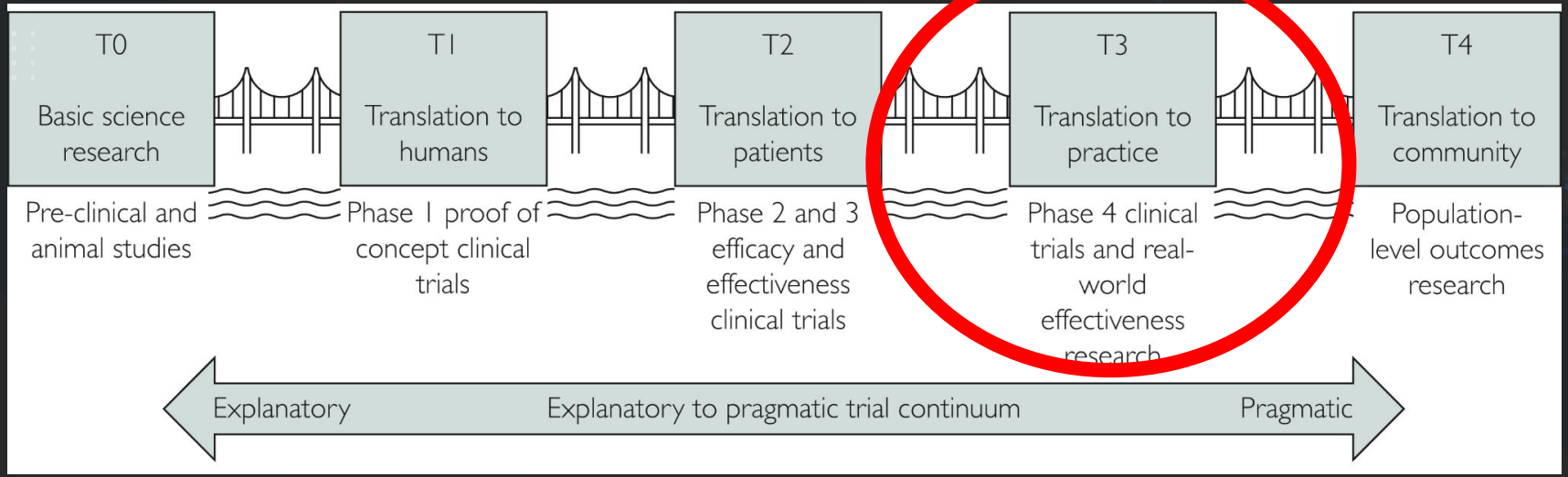
- 40 years ago, molecular basis of 20 diseases was known. Today, it is over 7,000
- $50 billion spent annually on translating research to practice
- End to end translation takes an 17-20 years with a 1% success rate



Austin, 2021;Rutten, 2024

Why does it take so long?

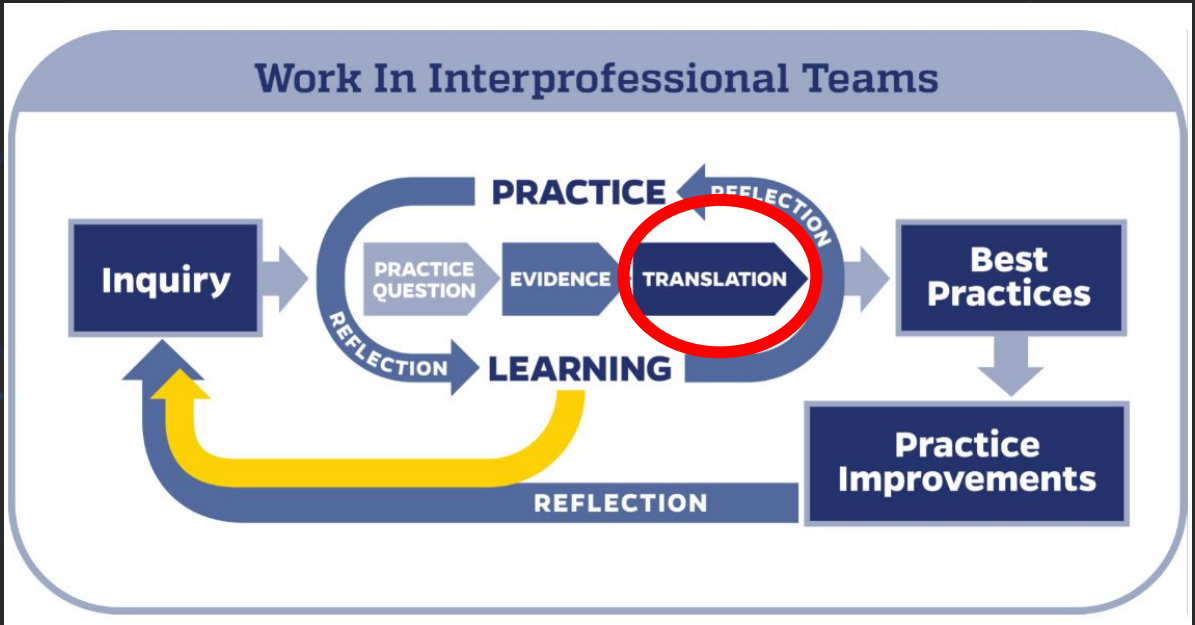
- Fast response prioritized to epidemics/pandemics
- Reactive social, health policy and healthcare systems
- Inequalities in racial, ethnic, geographic adoption



Proctor, 2022; Rutten, 2024

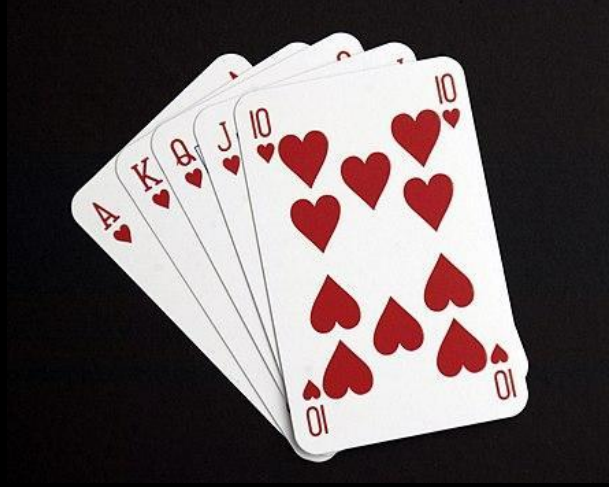
Why is it so difficult?

- Local data more influential than external evidence
- Does the evidence apply to us?
- It is difficult to change things
- This is how we have always done things
- What if we get complaints?



Johns Hopkins, 2024; White,

Question

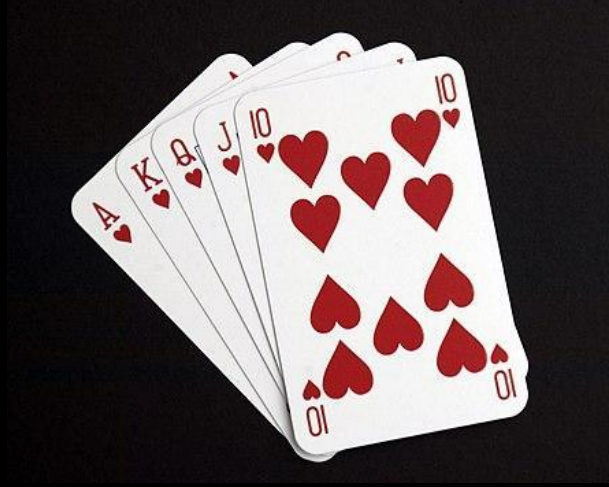


What should the head of bed be for stroke patients, even those with large vessel occlusions prior to thrombectomy?

A. Head of bed flat
B. Head of bed at or above 30 degrees
C. Head of bed less than 30 degrees

Johns Hopkins, 2024; White,

Zodiac Trial



- Largest RCT related to head position for LVO
- Multicenter trial – randomized 92 patients in US
- Newly diagnosed LVO prior to thrombectomy
- Randomized to 0 degrees or 30 degrees
- Primary endpoint
  - END based on NIHSS every 10 minutes from HOB positioning until thrombectomy or 2 hours whichever came first
- Secondary endpoints
  - NIHSS at 24 hours, 7 days, and 90 days post thrombectomy
  - Notice no mRS

Alexandrov,

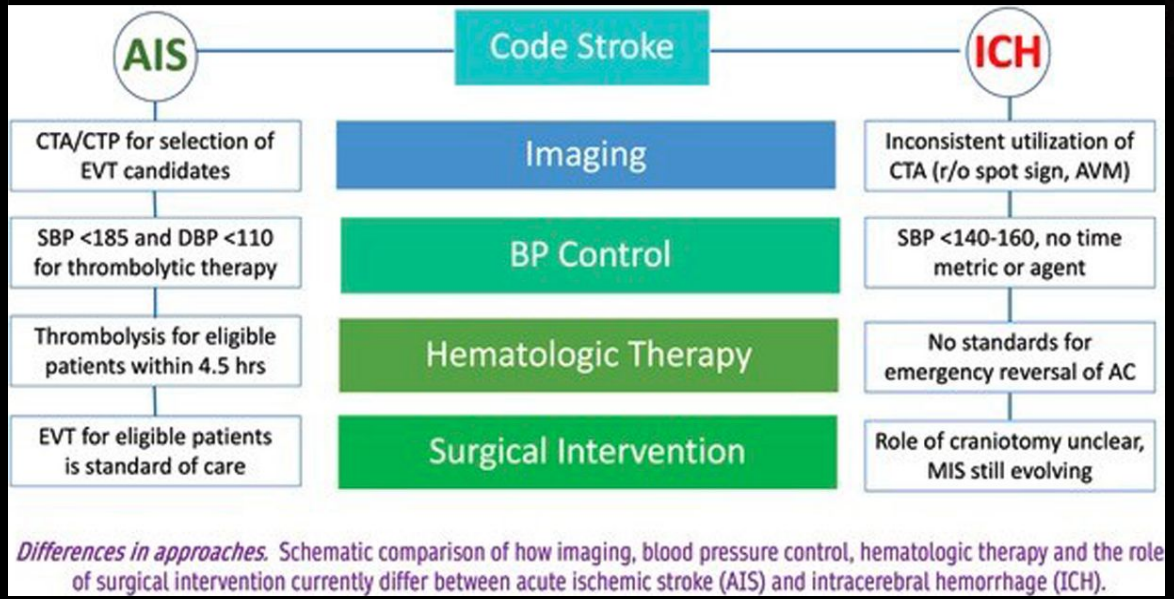
Characteristic	0 Degree Head Position	30 Degree Head Position	Difference (*p* value)
Death Day 7 or Discharge All cause	 1/45 (2.22%) 2/45 (4.44%)	 1/47 (2.13%) 10/46 (21.74%)	 1.0 0.03
Pneumonia	0	0	
NIHSS worsening > 2 points	1/45 (2.22%)	26/47 (55.3%)	<0.001, Z=5.59 53.1% absolute difference NNH 1.88
NIHSS worsening > 4 points	1/45 (2.22%)	20/47 (42.55%)	<0.001, Z=4.61 40.3% absolute difference NNH 2.48
NIHSS improvement at 24 hours	39/45 (86.67%)	28/46 (60.87%)	0.008
NIHSS improvement at 30 days	39/45 (86.67%)	31/46 (67.39%)	0.045

AHA/ASA, 2024

Implications of Zodiac

- Addition to primary treatment for CSC/TCC
  - 0 HOB improves CBF by 20%
- DIDO protocols
- EMS protocols
- Rehab costs
- Airway protection
- Stay tuned!

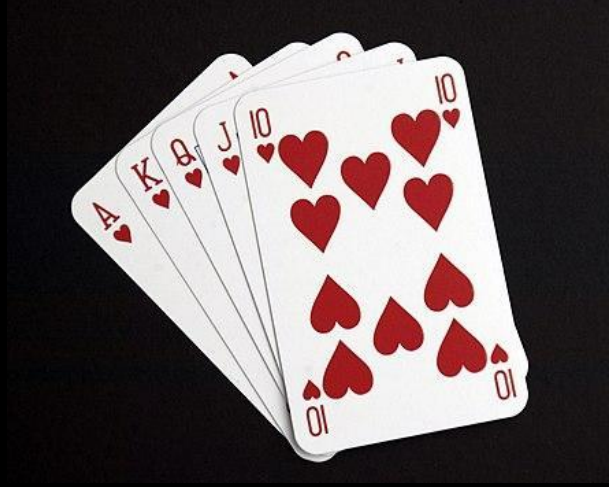
Code ICH



Differences in approaches. Schematic comparison of how imaging, blood pressure control, hematologic therapy and the role of surgical intervention currently differ between acute ischemic stroke (AIS) and intracerebral hemorrhage (ICH).

Li, 2023

Code ICH Overview



Bundled care

- Similar to ischemic stroke, sepsis, ventilator bundles, etc.
- Ultra early interventions such as BP control and AC reversal
- Built-in ICH layer with GTWG with time metrics in 2023

Based on 2018 statement for quality measures from AHA

Early adopters in AR - Washington Regional, BHFS, Mercy Fort Smith

Li, 2023; Hemphill,

Cards we are playing RIGHT

Smart sensor that monitors patient turning and mobility.

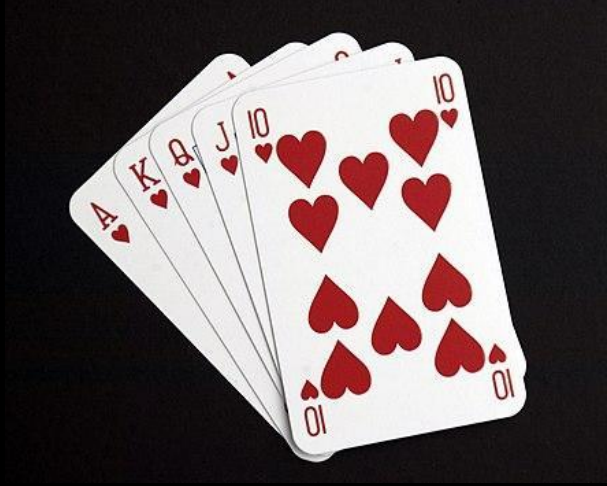
Helping you get CLOSER TO ZERO® pressure injury incidence

Leaf Healthcare

Wireless Patient Monitoring System

Distributed by smith&nephew

Cards we are playing RIGHT



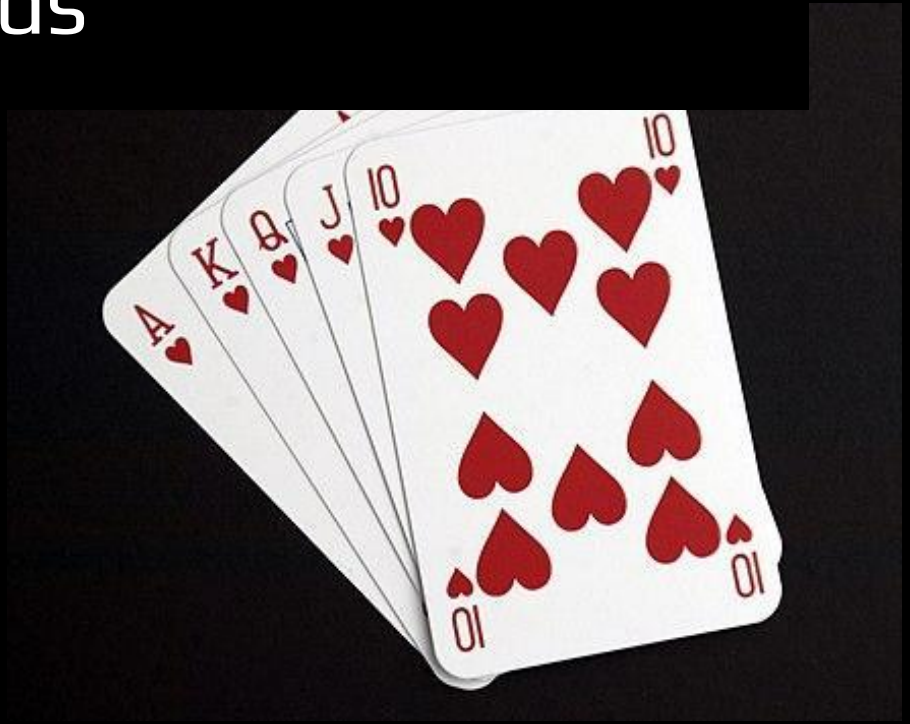
Finding the Right Cards

Podcasts
- NCS
- EMCRIT

Meetings
- ANVC

Journals
- Free Open Access
- Share them!

DON’T FORGET THE NIGHT SHIFT



Final Thought

Life and your profession lies not in holding good cards, but in playing the cards you hold well.

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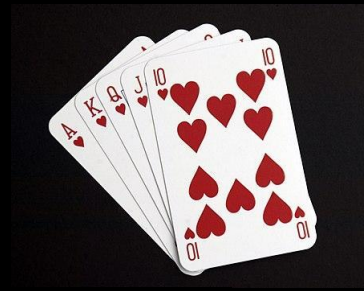

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Baptist Health

FOR YOU. FOR LIFE.

Diagnosis and Management of Aneurysmal SAH

MUDASSAR KAMRAN, MD MSC DPHIL (OXON)

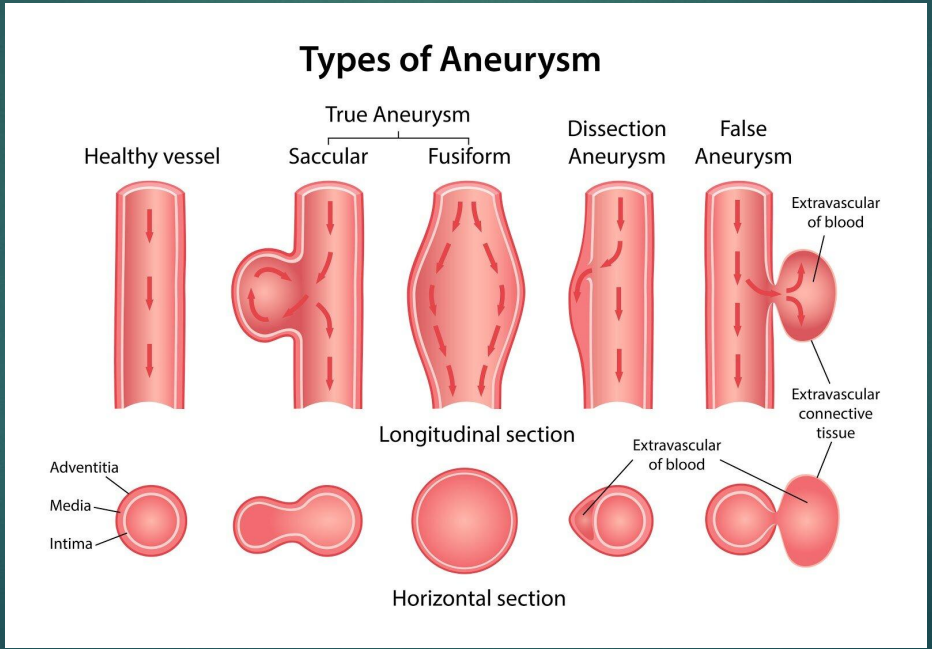
Introduction

- Hemorrhagic - 20% and Ischemic - 80%
- SAH – 10% and Intracerebral hemorrhage – 10%
- Causes of SAH: Trauma, aneurysm rupture, AVM/fistula, vasculitis, dissection. Amyloid, bleeding disorder and drug abuse
- Global incidence of aneurysmal SAH: 6.1 per 100,000 person-years
- Highest incidence: Japan (28 per 100,000 person-years) and Finland (16.6 per 100,000 person-years)
- Age: 50-55 years
- Higher incidence in black and female (1 vs 0.7)

Etminan N, Chang HS, Hackenberg K, de Rooij NK, Vergouwen MDI, Rinkel GJE, Algra A. Worldwide Incidence of Aneurysmal Subarachnoid Hemorrhage According to Region, Time Period, Blood Pressure, and Smoking Prevalence in the Population: A Systematic Review and Meta-analysis. JAMA Neurol. 2019 May 1;76(5):588-597. doi: 10.1001/jamaneurol.2019.0006. PMID: 30659573; PMCID: PMC6515606.

Brain Aneurysm

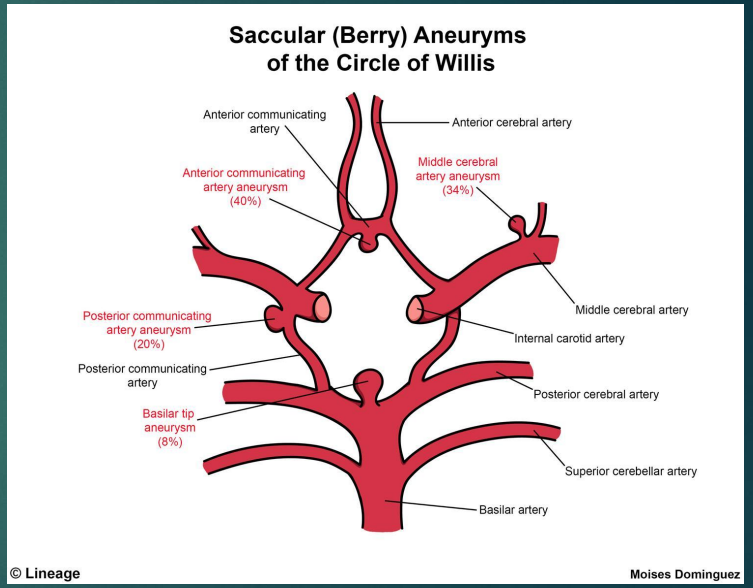
- Bulge or ballooning in a brain blood vessel due to weakened blood vessel wall



https://www.interventionalneurology.com.au/brain-aneurysm

Brain Aneurysm

- Prevalence of saccular aneurysm: 3.2%
- Mean age: 50 years
- F:M – 1:1 (increases to 2:1 above 50 yrs.)
- Multiple aneurysms: 20 – 30%
- 85% in anterior circulation (circle of Willis)
- Rupture of aneurysm: 0.4 to 0.6% of all death
- 22 - 26% die before coming to hospital
- 13% die in the hospital
- One-third have good result after treatment



Risk factors of Aneurysm Formation and Rupture

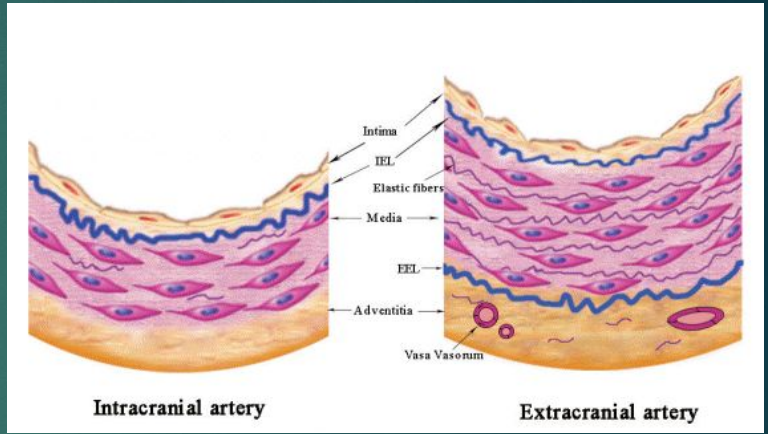
- Hereditary syndromes: Connective tissue disease (Ehlers-Danlos syndrome and pseudoxanthoma elasticum), Autosomal dominant PKD and Moyamoya syndrome
- Familial aneurysms: first degree relatives – 9%, 3.6 times greater risk, rupture at smaller size and younger age, similar location
- HTN
- Cigarette smoking
- Estrogen deficiency

} 15 times increased risk of SAH

- Coarctation of aorta
- Size > 7 mm
- Growing size
- Location: posterior circulation > anterior circulation > cavernous
- Other: Alcohol, sympathomimetic drugs (Phenylpropanolamine, Methamphetamine and cocaine abuse), race (Japanese), prior SAH (0.5% per year), presence of daughter sac, multiple aneurysms

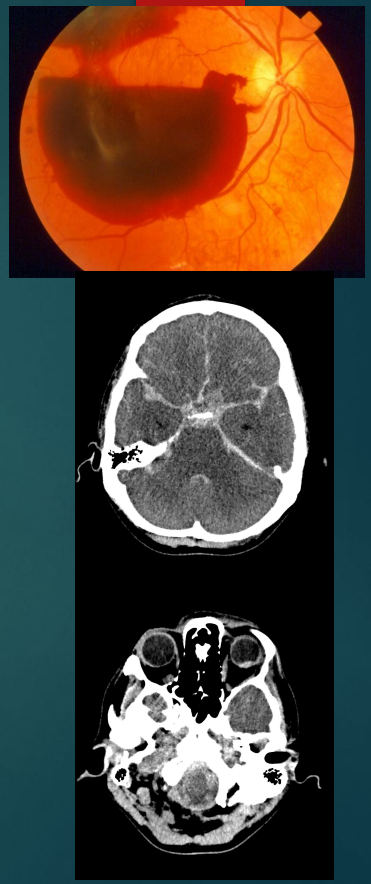
Pathogenesis of aneurysm rupture

- Saccular aneurysms: very thin or absent tunica media; absent or severely fragmented internal elastic lamina
- Fusiform aneurysm: enlargement of entire circumference
- Mycotic aneurysm: infected emboli
- Saccular aneurysms are acquired due to hemodynamic stress- develops in days, weeks or months
- Rupture secondary to an acute trigger event: physical exertion and sudden increase in blood pressure



Clinical Manifestation

- Headache: sudden severe "thunderclap" headache or "worst headache of my life"
- Brief loss of consciousness
- Nausea and vomiting
- Neck pain and stiffness (meningismus)
- Photophobia
- Terson syndrome
- **Mass effect:** visual acuity loss, cranial neuropathy, pyramidal tract dysfunction, facial pain
- Ischemic stroke
- **Secondary events:** Hydrocephalus, vasospasm (regional cerebral hypoperfusion and delayed cerebral ischemia) and ICP



Case courtesy of Mark Hall, Radiopaedia.org, rID: 52053

Clinical Grading of SAH

Hunt and Hess grading system for patients with subarachnoid hemorrhage

Grade	Neurologic status
1	Asymptomatic or mild headache and slight nuchal rigidity
2	Severe headache, stiff neck, no neurologic deficit except cranial nerve palsy
3	Drowsy or confused, mild focal neurologic deficit
4	Stuporous, moderate or severe hemiparesis
5	Coma, decerebrate posturing

Based upon initial neurologic examination.

Adapted from: Hunt W, Hess R. Surgical risk as related to time of intervention in the repair of intracranial aneurysms. J Neurosurg 1968; 28:14.

UpToDate®

World Federation of Neurological Surgeons subarachnoid hemorrhage grading scale

Grade	GCS score	Motor deficit
1	15	Absent
2	13 to 14	Absent
3	13 to 14	Present
4	7 to 12	Present or absent
5	3 to 6	Present or absent

GCS: Glasgow Coma Scale.

Data from: Report of World Federation of Neurological Surgeons Committee on a Universal Subarachnoid Hemorrhage Grading Scale. J Neurosurg 1988; 68:985.

UpToDate®

CT grading of SAH

Table 1. Description of Fisher Grading Scale, Fisher et al., 1980 (5)

Grade	Descriptions
Fisher I	No blood detected
Fisher II	Diffuse deposition or thin layer with all vertical layers of blood (interhemispheric fissure, insular cistern, ambient cistern) < 1 mm thick
Fisher III	Localized clots and/or vertical layers of blood ≥ 1 mm in thickness
Fisher IV	Diffuse or no subarachnoid blood, but with intracerebral or intraventricular clots

Modified Fisher (Claassen) subarachnoid h emorrhage CT rating scale

Grade	Head CT criteria
0	No SAH or IVH
1	Minimal SAH and no IVH
2	Minimal SAH with bilateral IVH
3	Thick SAH (completely filling one or more cistern or fissure) without bilateral IVH
4	Thick SAH (completely filling one or more cistern or fissure) with bilateral IVH

CT: computed tomography; SAH: subarachnoid hemorrhage; IVH: intraventricular hemorrhage.

From: Claassen J, Bernardini GL, Kreiter K, et al. Effect of cisternal and ventricular blood on risk of delayed cerebral ischemia after subarachnoid hemorrhage: the Fisher scale revisited. Stroke 2001; 32:2012.

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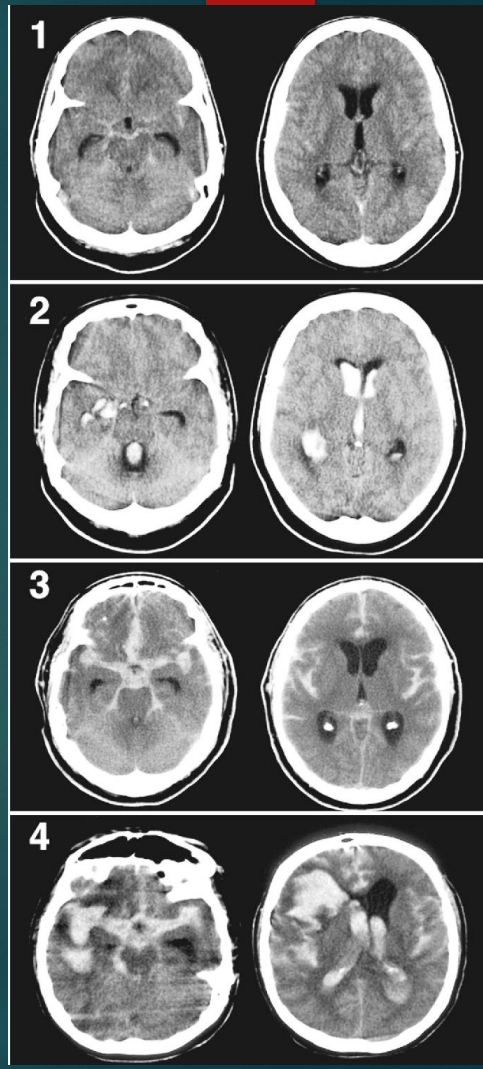
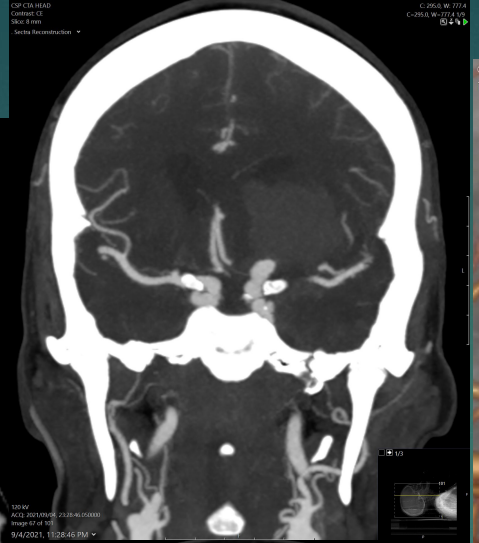


Diagnostic approach

- Non-contrast CT head: nearly 100% sensitive within first 6 hrs. sensitivity reduces with time and amount of SAH
- Location of blood: Basal cisterns, sylvian fissures, interhemispheric fissure, interpeduncular fossa, and suprasellar, ambient, and quadrigeminal cisterns. Intracerebral extension (20 to 40%)
- Other location: Convexity (RCVS & Amyloid angiopathy), anterior and middle cranial fossa (trauma), in front of brainstem (peri mesencephalic SAH)
- Lumbar puncture: strong suspicion of SAH with negative CT head
- Measuring opening pressure, CSF RBC count and xanthochromia
- CTA- 83-98% sensitive. Small aneurysms ≤2 mm difficult to detect
- Brain MRI: GRE and FLAIR sequences
- DSA (Digital Subtraction angiography)- Gold standard


CSP CTA HEAD
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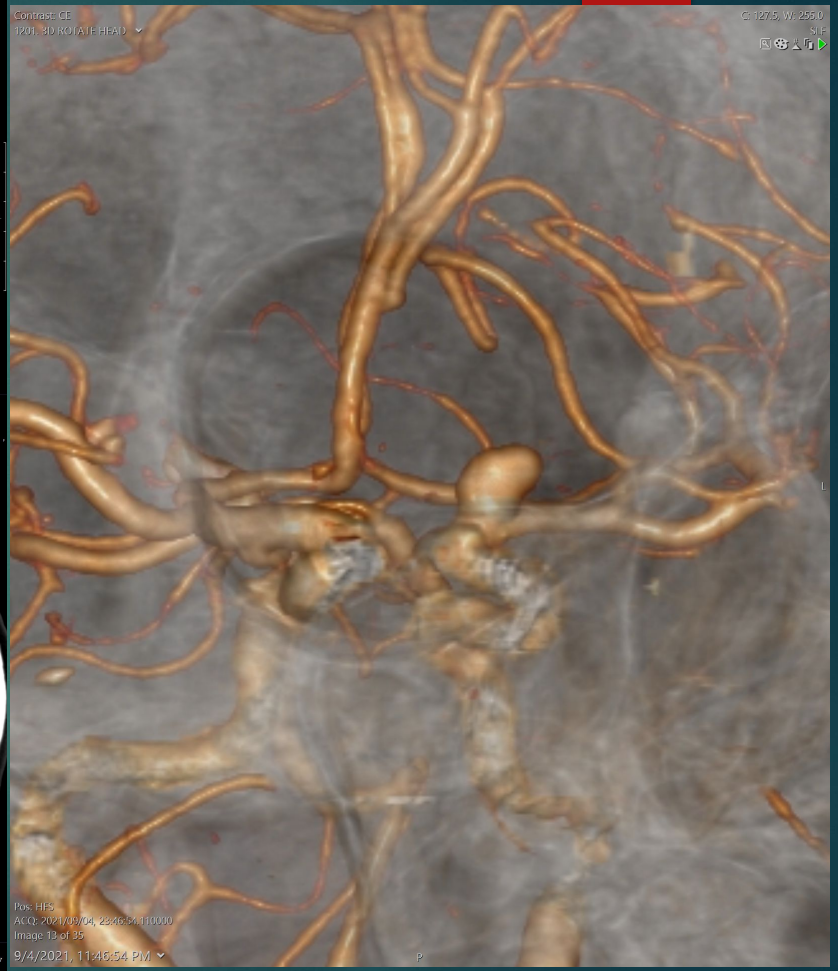
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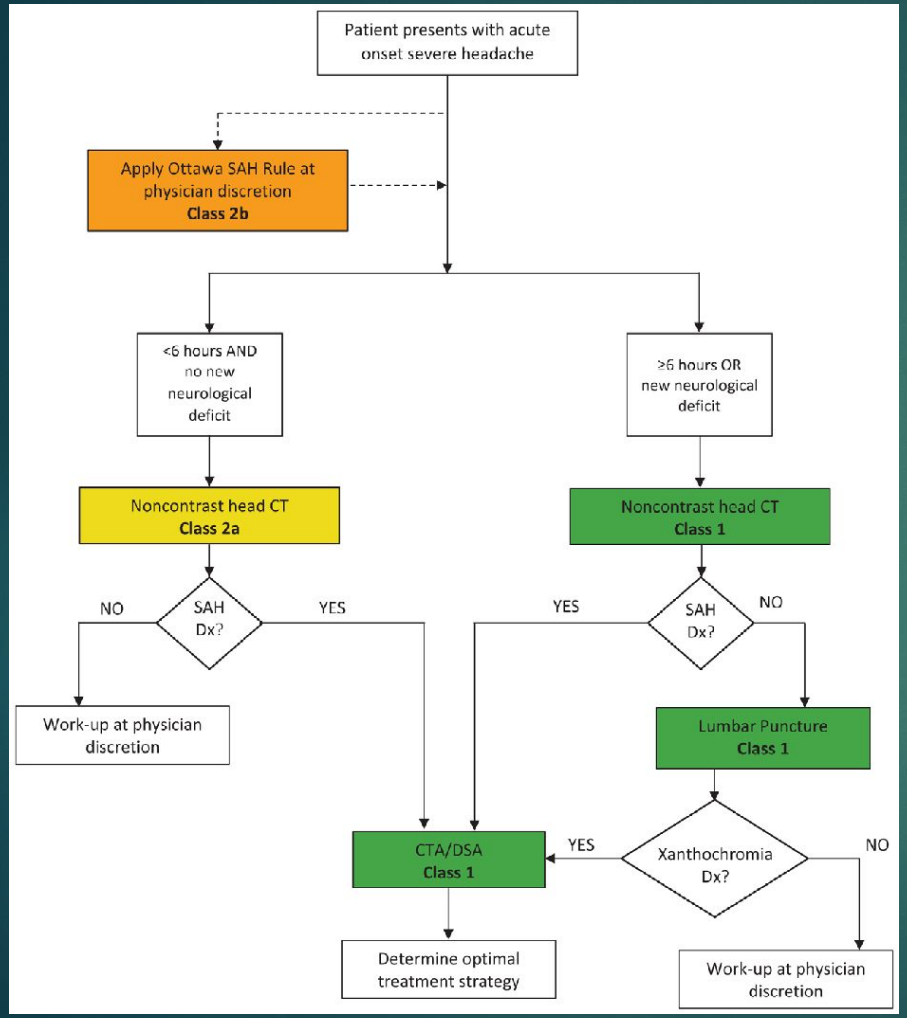


Table 3. Ottawa SAH Rule

For alert patients >15 y of age with new severe nontraumatic headache reaching maximum intensity within 1 h. Patients require additional investigation for SAH if they meet any of the following criteria:	
1	Age ≥40 y
2	Neck pain or stiffness
3	Witnessed loss of consciousness
4	Onset during exertion
5	Thunderclap headache (instantly peaking pain)
6	Limited neck flexion on examination

SAH indicates subarachnoid hemorrhage.

Stroke. 2023;54:e314–e370. DOI: 10.1161/STR.0000000000000436

Management

- SAH has very high mortality and morbidity
- Aneurysm rebleeding: 3-4% in first 24 hours and 1-2% each day in first month
- Aneurysm re-rupture: 70% mortality
- Stabilization of patient: secure airway, normalizing cardiovascular function, and treating seizures
- Admit or transfer to expert center and admit to Neuro ICU with bedrest, analgesia, venous thromboembolism prophylaxis, and discontinuation of antithrombotic (plus reversal of anticoagulation when present). Continuous monitoring for hemodynamic and neurologic complications
- Other measures: prevent vasospasm and delayed cerebral ischemia, blood pressure control (SBP <160 mmHg or MAP <110 mmHg), euvolemia, treatment with nimodipine
- Acute care: Prevention of rebleeding by early repair (surgical clipping or endovascular coiling)

CARE CONTINUUM

1 → 2 → 3 → 4 → 5

PREHOSPITAL | EMERGENCY DEPT. | ACUTE HOSPITALIZATION | POST-ACUTE CARE | OUTPATIENT

PHASES OF CARE

EARLY BRAIN INJURY
- Acute resuscitation
- Emergency diagnosis
- Prevent rebleeding
- Treat hydrocephalus
- Manage elevated ICP
- Manage seizures

DELAYED BRAIN INJURY
- Delayed cerebral ischemia
- Sodium dysregulation
- Systemic complications
- Fever and temperature management
- Glucose management
- Nutritional support

RECOVERY
- Acute rehabilitation
- Headache and seizure management
- Monitoring of aneurysm(s)
- Screening for cognitive and mood disorders
- Long-term outcomes

PATIENT-CENTRIC CARE

HEALTH EQUITY
SHARED DECISION-MAKING
EDUCATION

→ PATIENT
FAMILY
CAREGIVERS ←

COMPREHENSIVE CENTERS
SYSTEMS OF CARE
MULTIDISCIPLINARY TEAMS

Timing and choice of Treatment

- Within 24 to 72 hours
- Choice of therapy: Factors Neurologic grade and clinical status, patient age, the availability of expertise in surgical and endovascular techniques, anatomic characteristics (location, size and neck)
- Good grade SAH (Hunt and Hess grades I to III): Surgery Vs Endovascular International Subarachnoid Aneurysm Trial (ISAT)

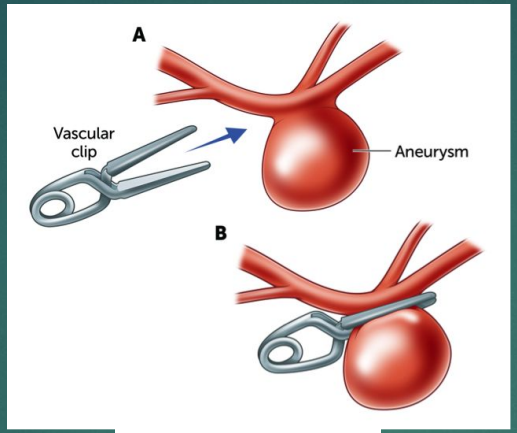
  - ✔ *Lower rate of death and disability (23.5 vs 30.9)*
  - ✔ *Higher rate of rebleeding in the first year; however, similar at 8 years*
  - ✔ *Lower rate of post-treatment seizure*

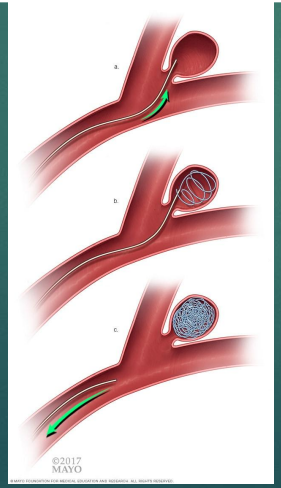
- Poor grade SAH (Hunt and Hess IV and V): early treatment with endovascular has better outcome

Treatment

Surgical:

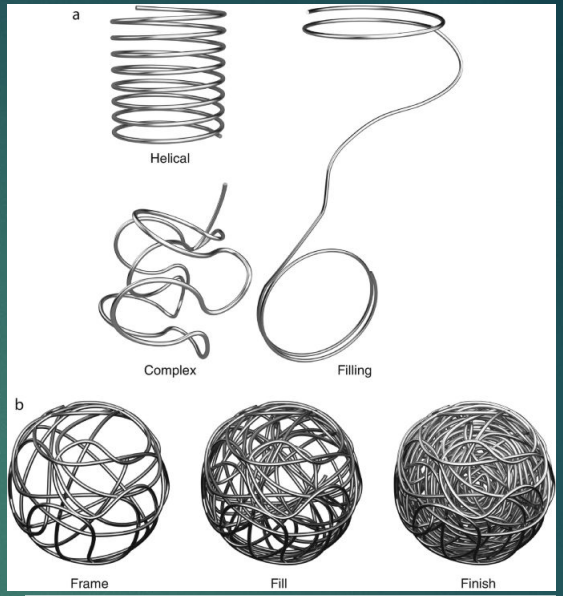
- Craniotomy for clipping
- Walter Dandy, 1937





Endovascular:

- Coil embolization
- Guido Guglielmi, 1991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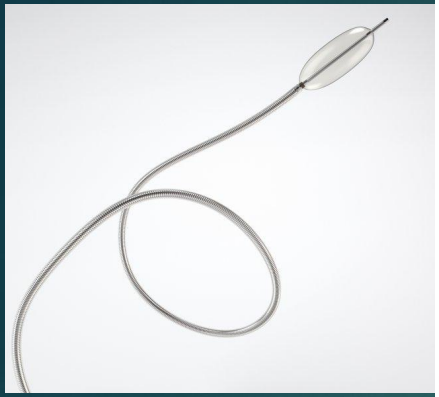
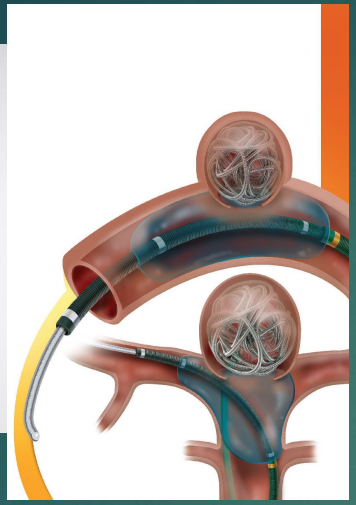
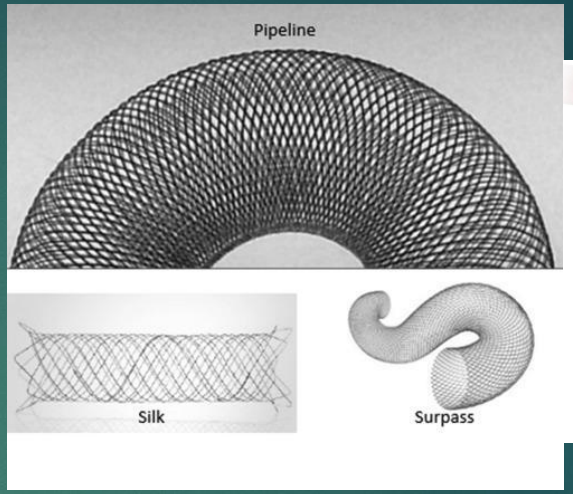
b
Frame
Fill
Finish

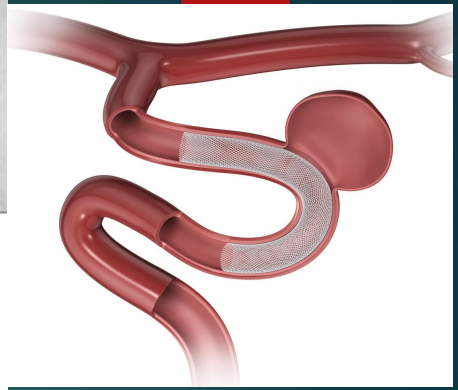
Balloon assisted coiling



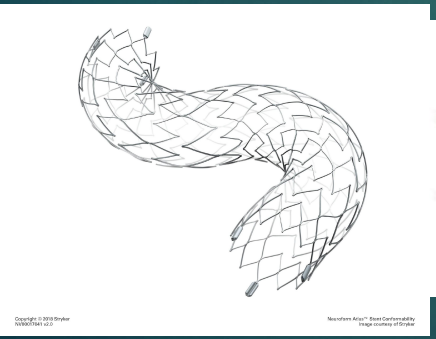


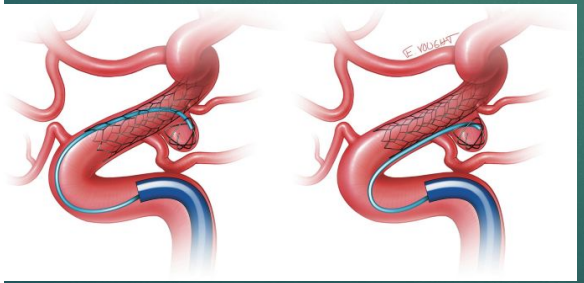
Flow Diverter Stent

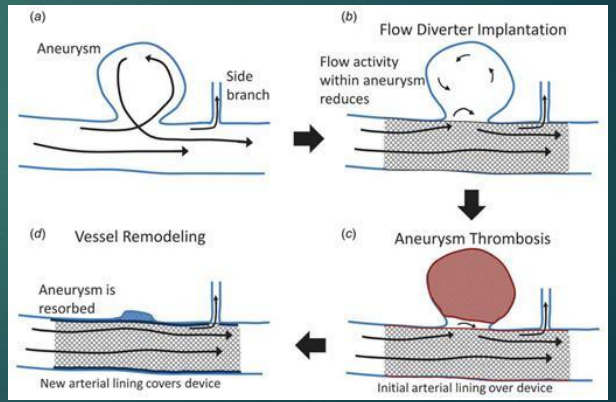




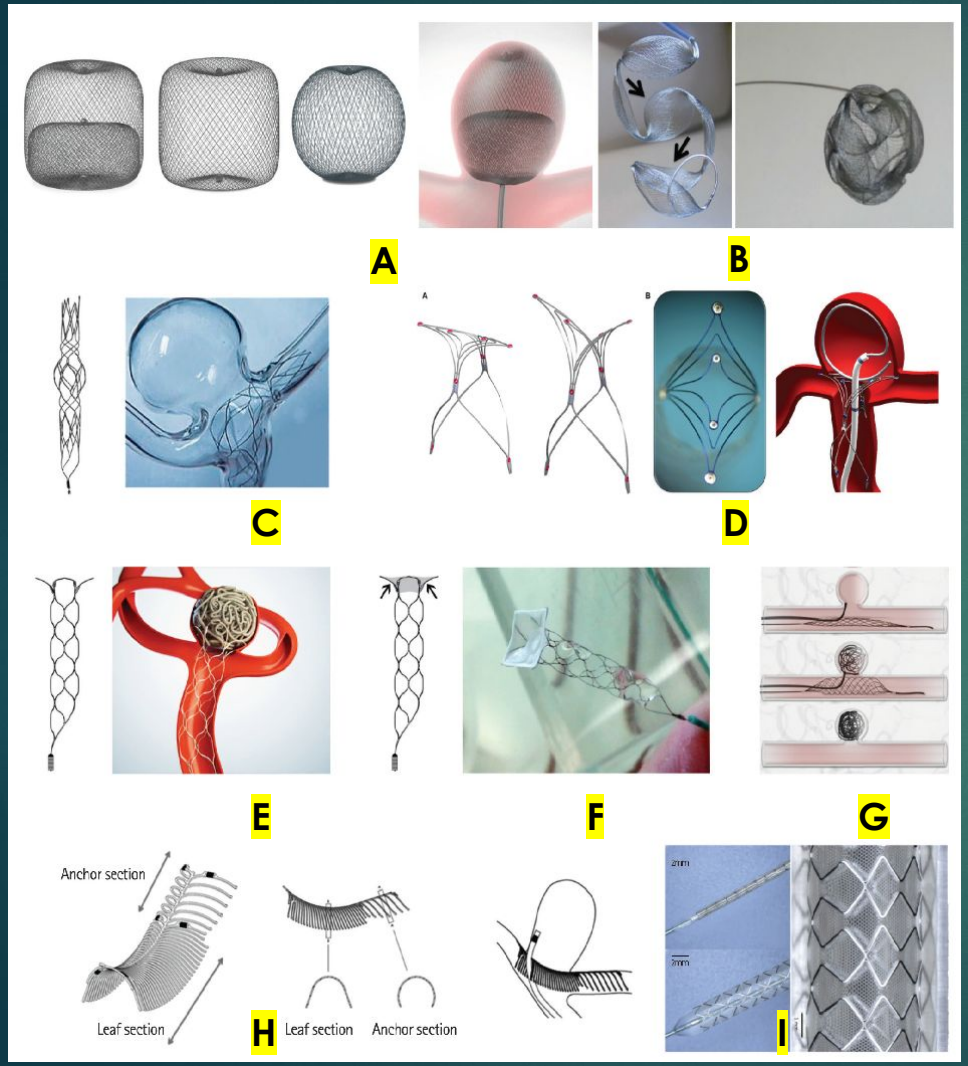
Stent assisted coiling







Munich, S.A., Lopes, D.K., Crowley, R.W. (2019). Stent-Assisted Coil Embolization. In: Spiotta, A., Turner, R., Chaudry, M., Turk, A. (eds) Management of Cerebrovascular Disorders. Springer, Cham. https://doi.org/10.1007/978-3-319-99016-3_12



A: Woven Endo-Bridge (WEB)

B: Medina Embolization device (MED)

C: Barrel Stent device

D: PulseRider device (T & Y configuration)

E: pCONus

F: pCANvas

G: Comaneci device

H: eCLIPS

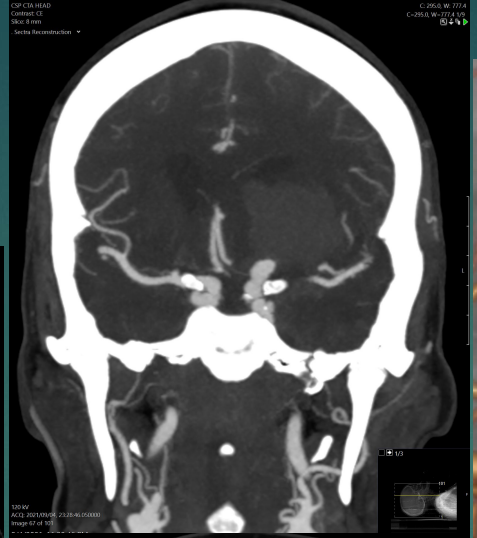
I: Balloon-expandable honeycomb microporous covered stent

Jia ZY, Shi HB, Miyachi S, Hwang SM, Sheen JJ, Song YS, Kim JG, Lee DH, Suh DC. Development of New Endovascular Devices for Aneurysm Treatment. J Stroke. 2018 Jan;20(1):46-56. doi: 10.5853/jos.2017.02229. Epub 2018 Jan 31. PMID: 29402066; PMCID: PMC5836571.

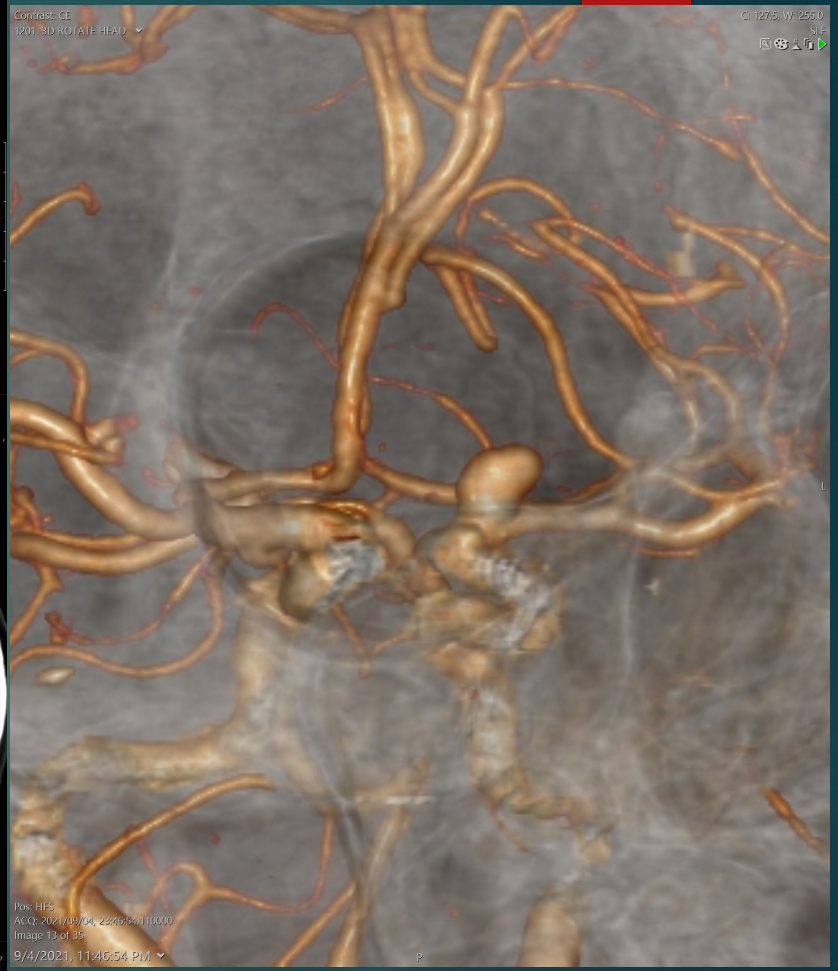
Case- 1

Balloon assisted coiling of Ophthalmic ICA aneurysm

70-YEAR-OLD FEMALE WITH SUDDEN FALL AND GCS 3. EXTENSIVE GR 4 SAH AND INTRACEREBRAL HEMORRHAGE

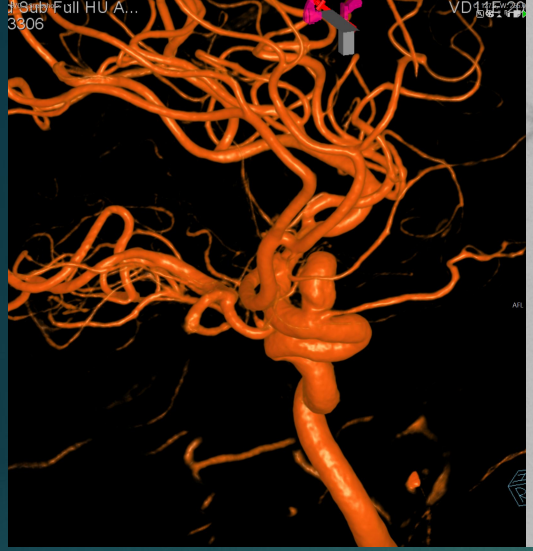

CSP CTA HEAD
Contrast: CE
Slice: 8 mm
Sectra Reconstruction
C: 295.6, W: 777.4
C=295.0, W=777.4 1/3
120 kV
ACQ: 2021/09/04, 23:23:46.050000
Image 47 of 101

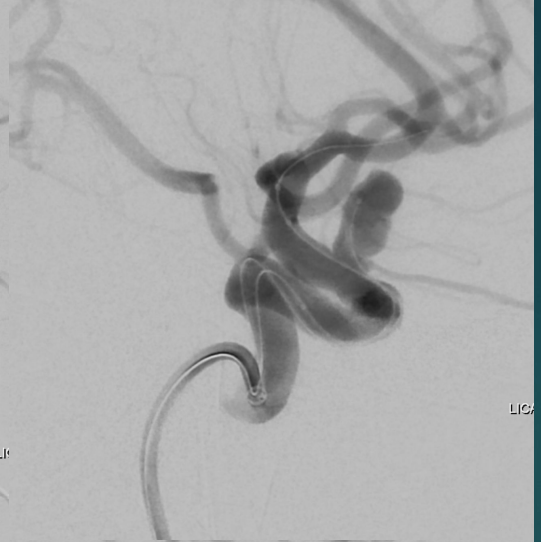

1/3

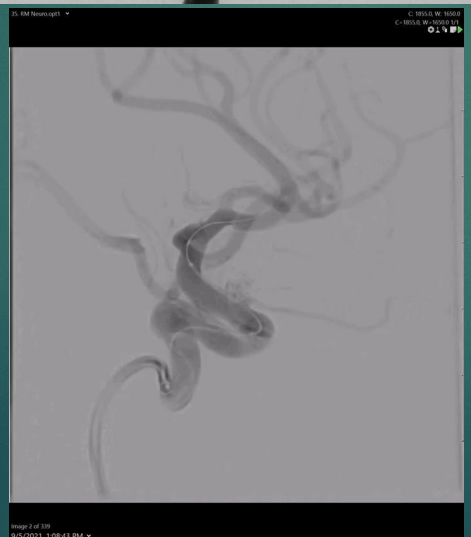

Contrast: CE
1201, 3D ROTATE HEAD
C: 127.5, W: 255.0
Pos: HFS
ACQ: 2021/09/04, 23:46:54.110000
Image 13 of 35
9/4/2021, 11:46:54 PM

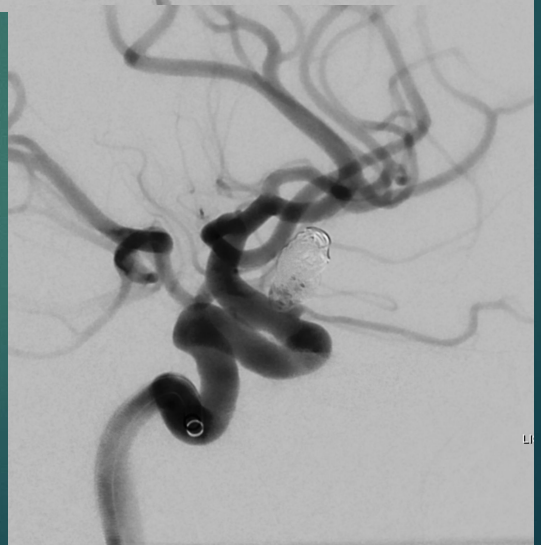
Device

- 7F Shuttle sheath- 80 cm
- 125 cm 5F Vert catheter
- .035 Terumo glide wire
- 6F Sofia intermediate catheter
- Scepter c balloon- 4x11 mm
- SL-10 microcatheter
- Synchro 14 micro guidewire
- Stryker detachable coils







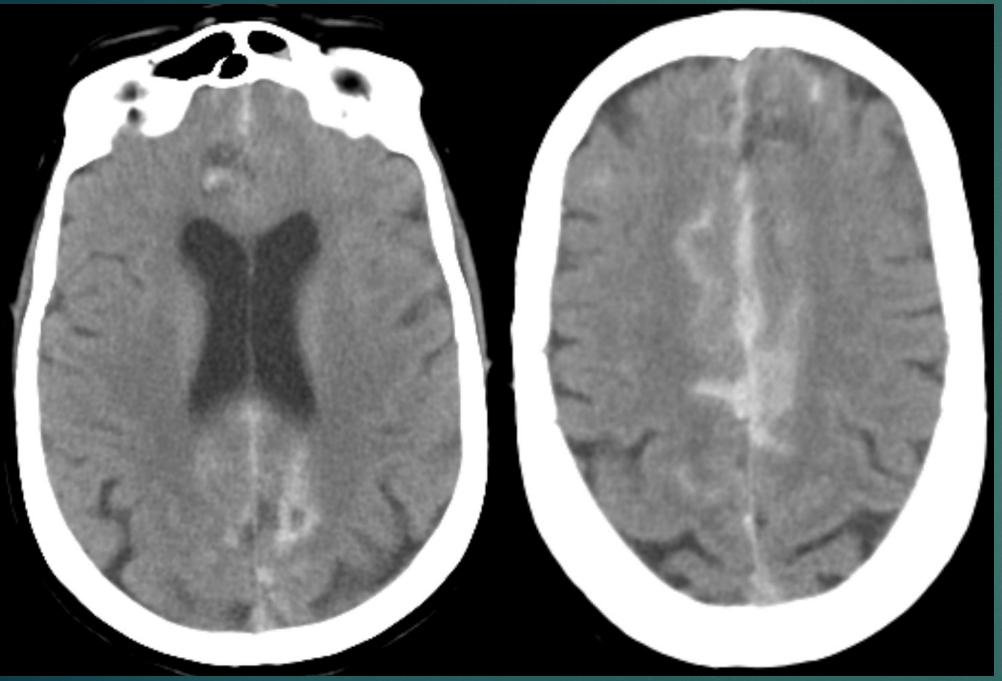


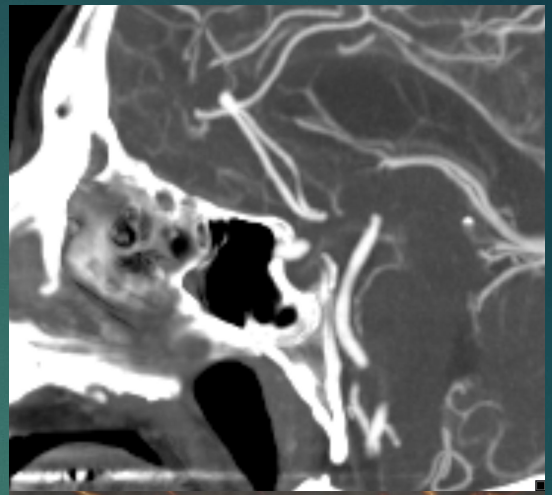
Post Coiling

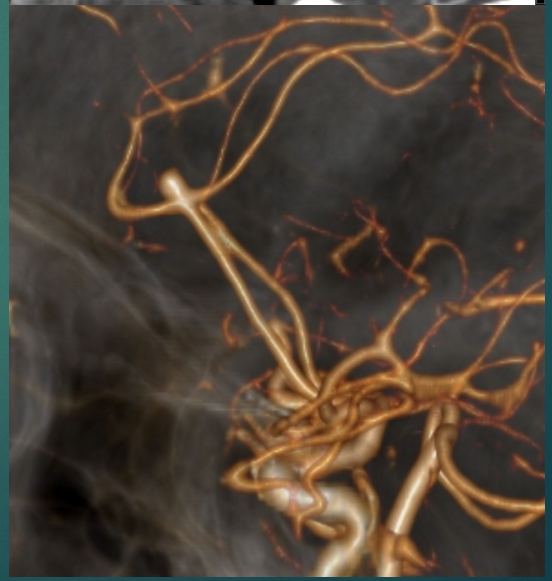
Case- 2

Simple Coiling of Left pericallosal artery aneurysm

56-YEAR-OLD FEMALE WITH SUDDEN SEVERE HEADACHE, NECK PAIN AND VOMITING. GCS: 15. GR 4 SAH ON CT

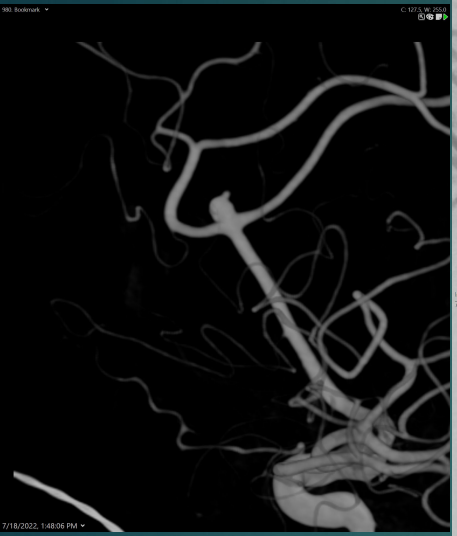






Device

- 7F Shuttle sheath- 80 cm
- 125 cm 5F Vert catheter
- .035 Terumo glide wire
- 6F Sofia intermediate catheter
- SL-10 microcatheter
- Synchro 14 micro guidewire
- Stryker detachable coils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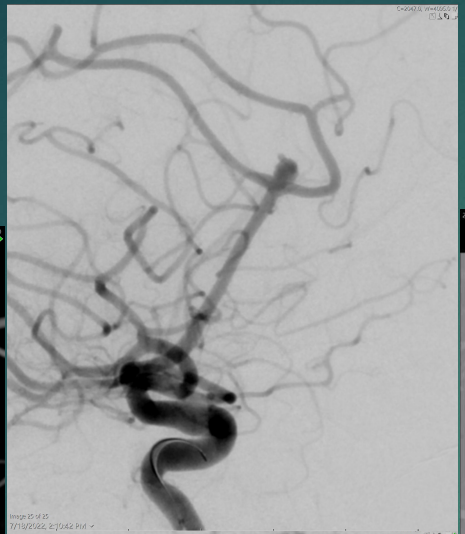
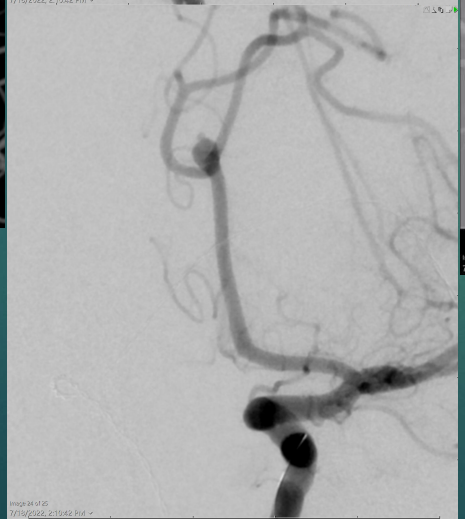
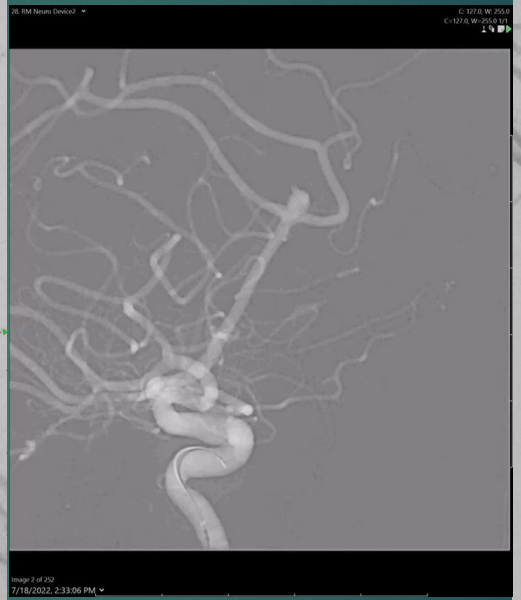
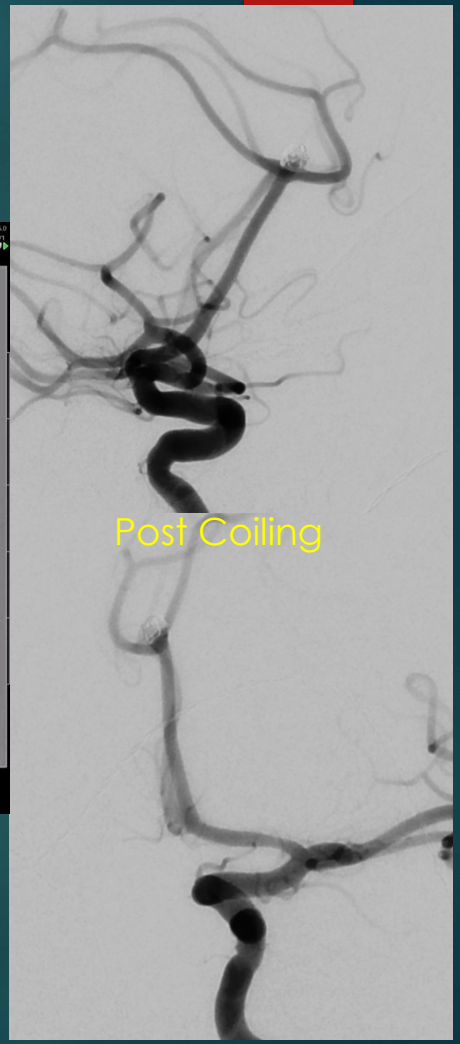
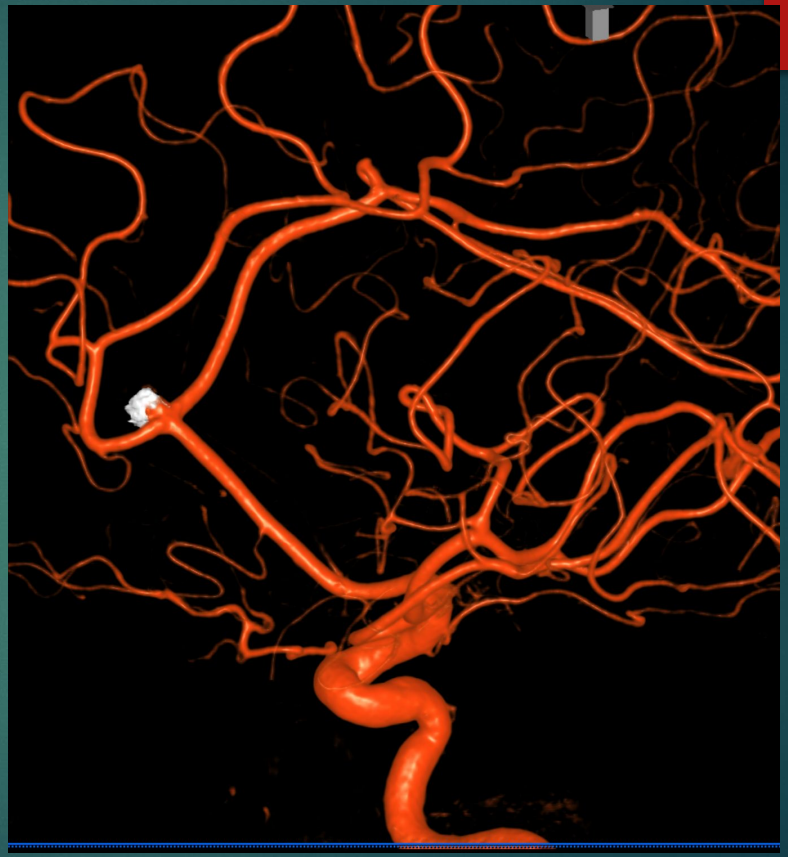





7/18/2022, 2:33:06 PM


Post Coiling

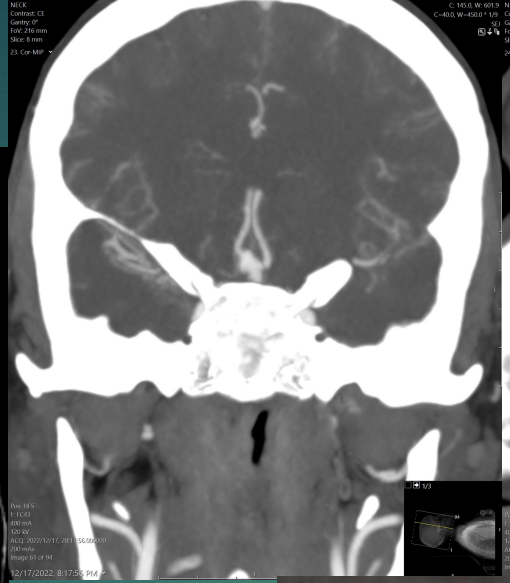


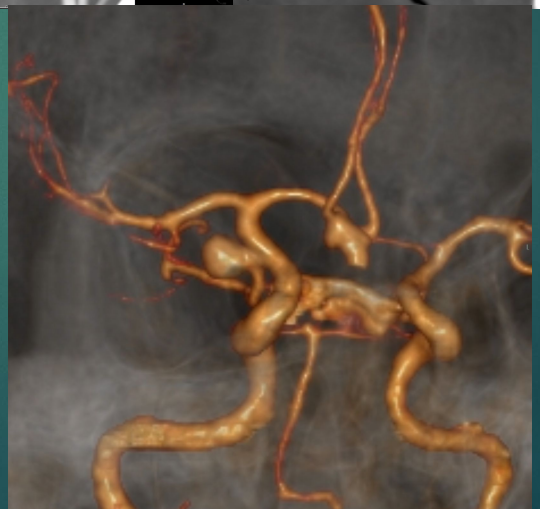
6 month Follow up MRA and DSA

Case- 3

Simple coiling of ruptured ACOM and PCOM aneurysm

55-YEAR-OLD FEMALE WITH SUDDEN SEVERE HEADACHE, BACK PAIN, NECK PAIN AND NAUSEA. NO NEURODEFICIT. GCS: 15. GR 4 SAH ON CT HEAD

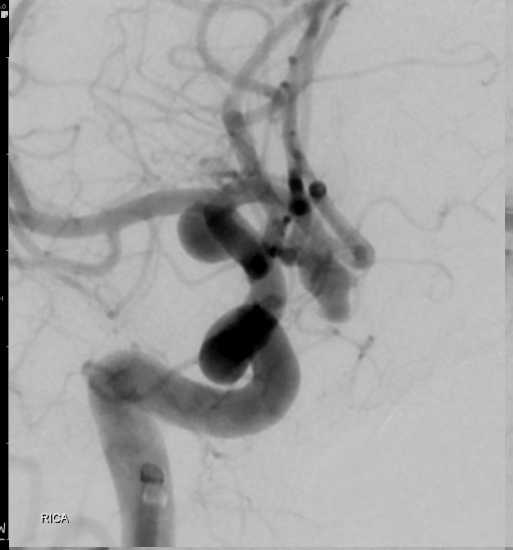




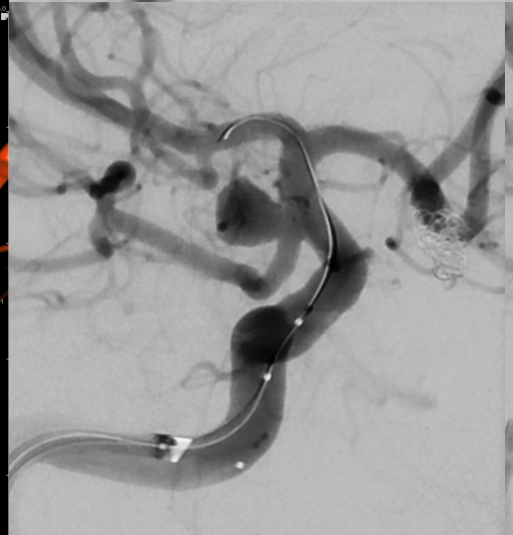
Device

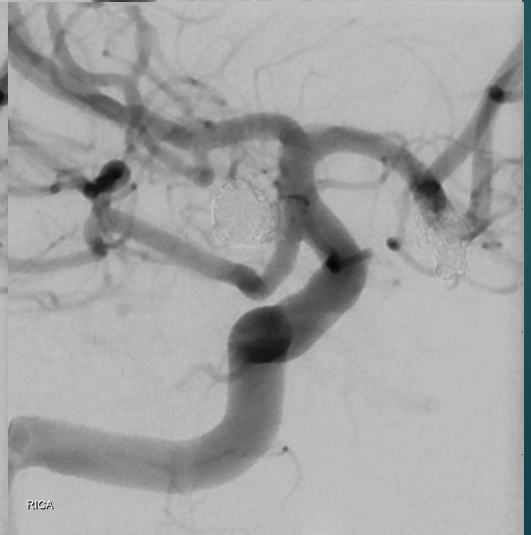
- 8F Trackstar guide catheter
- 125 cm 5F Vert catheter
- .035 Terumo glide wire
- Scepter c balloon- 4x11 mm
- SL-10 microcatheter
- Synchro 14 micro guidewire
- Stryker detachable coils

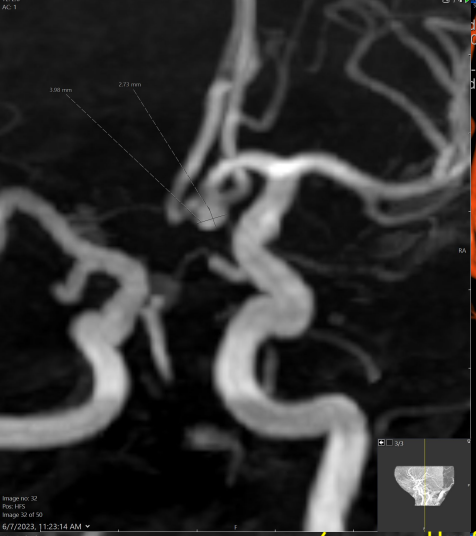

d6
d5
d5
7.37 mm
d6
5.30 mm

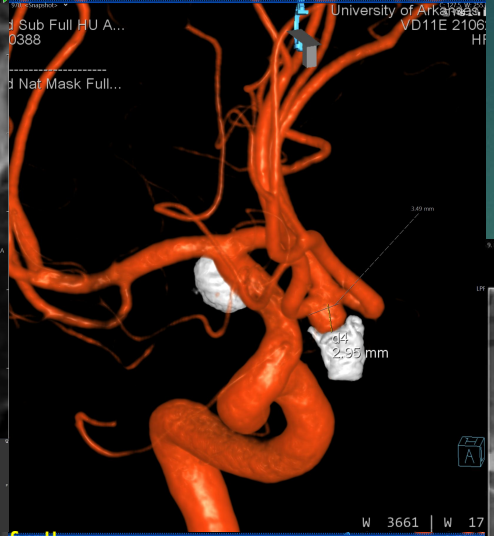

RICA

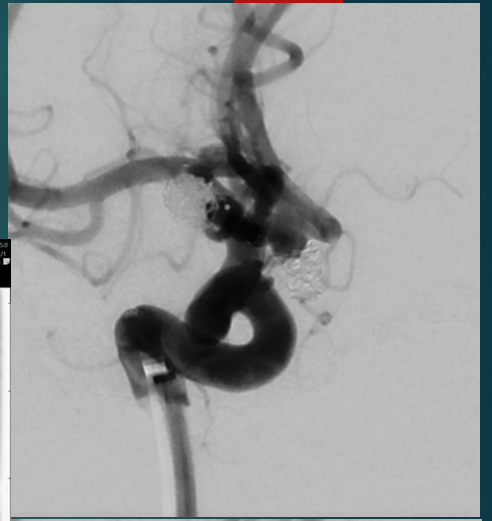

d2
d1
d1
6.09 mm
d2


RICA

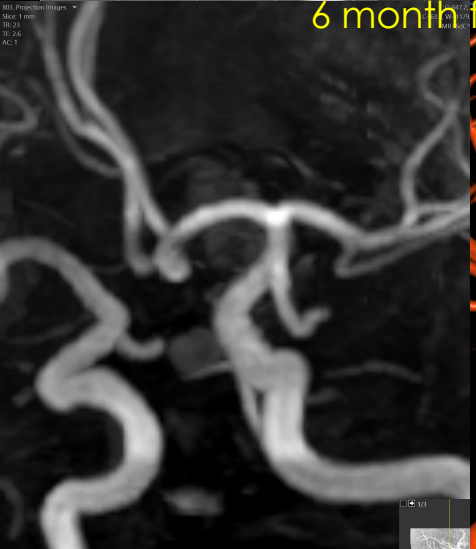


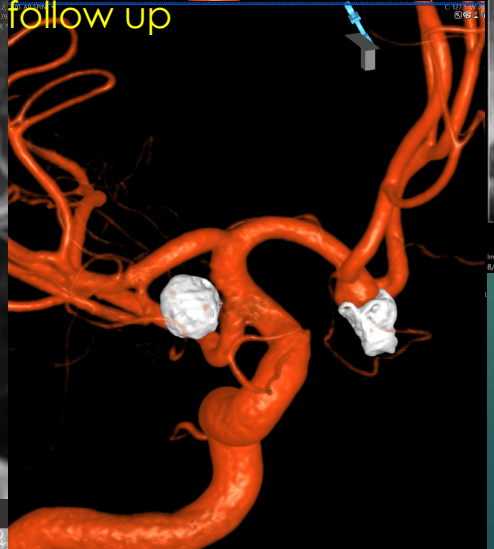


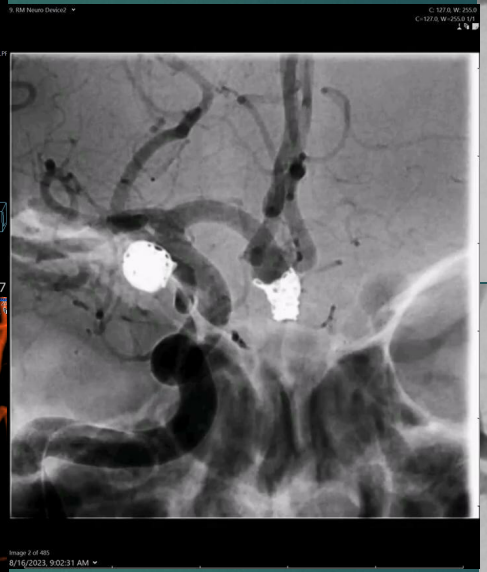




6 month follow up







Stent Assisted
Coiling
Neuroform Atlas
stent + Coils

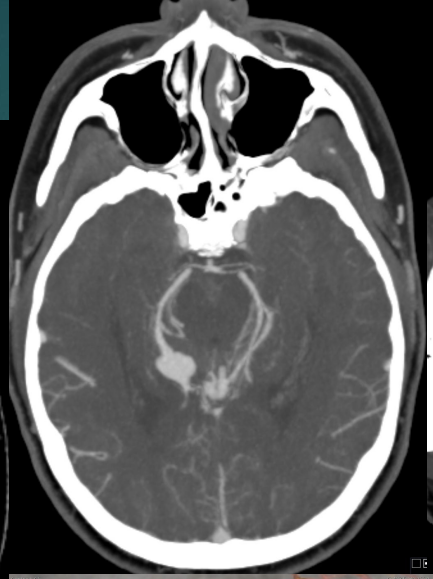
Case- 4

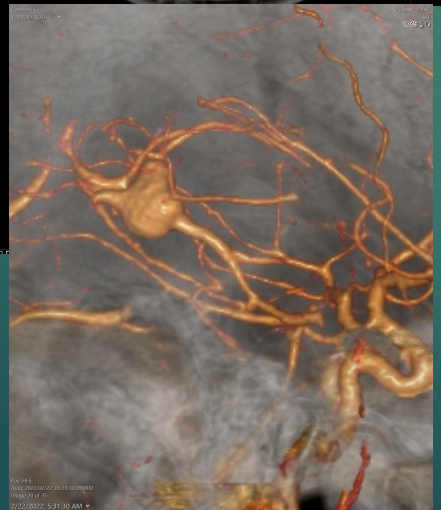
Coiling and Parent artery occlusion of a dissecting PCA aneurysm

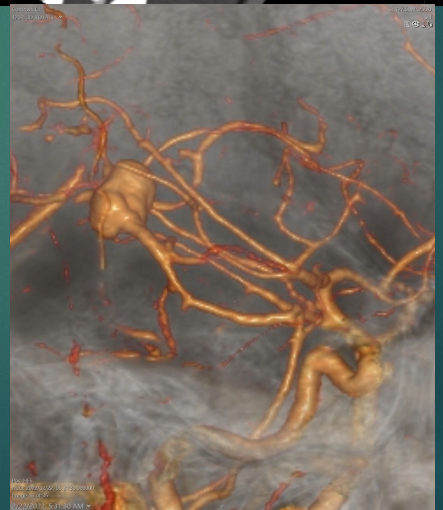
38-YEAR-OLD FEMALE WITH SUDDEN SEVERE HEADACHE

NEUROLOGICALLY STABLE WITH GCS: 15

GR- 2 SAH ON CT HEAD

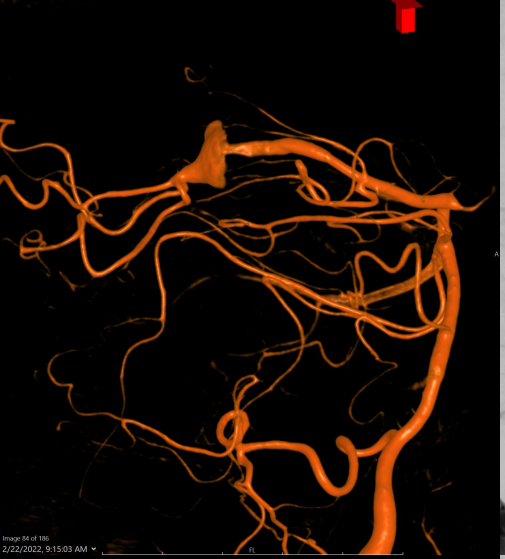






Device

- 6F Shuttle sheath- 80 cm
- 125 cm 5F Vert catheter
- .035 Terumo glide wire
- 6F Sofia intermediate catheter
- SL-10 microcatheter
- Synchro 14 micro guidewire
- Stryker detachable coils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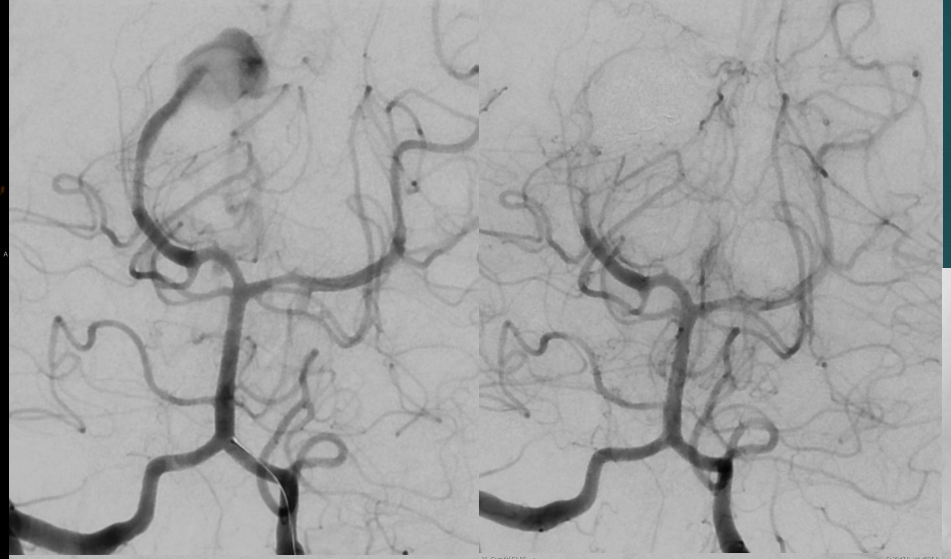
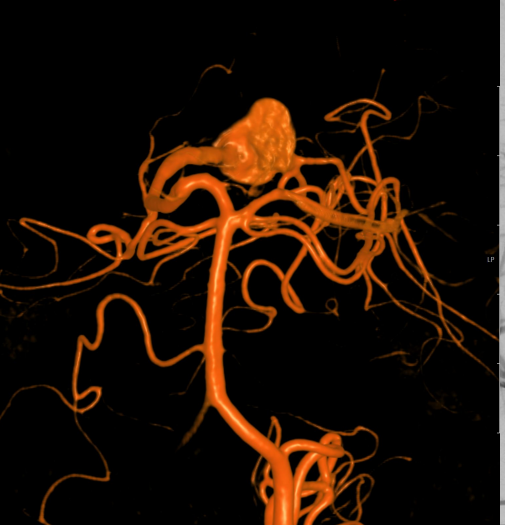
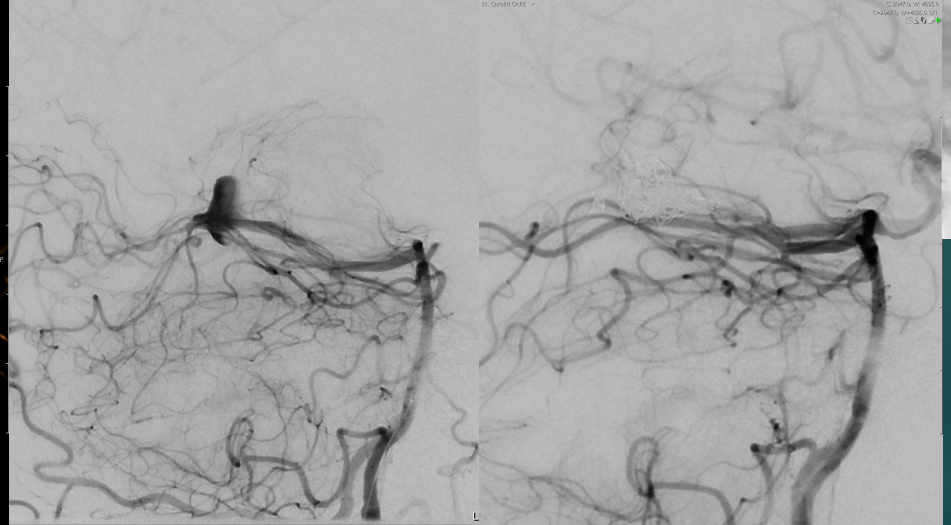
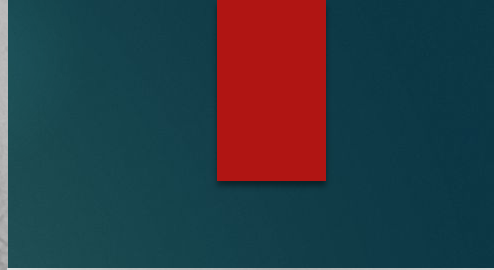
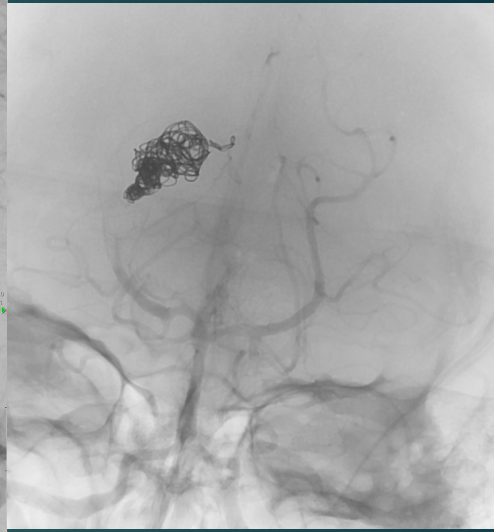







Case- 5

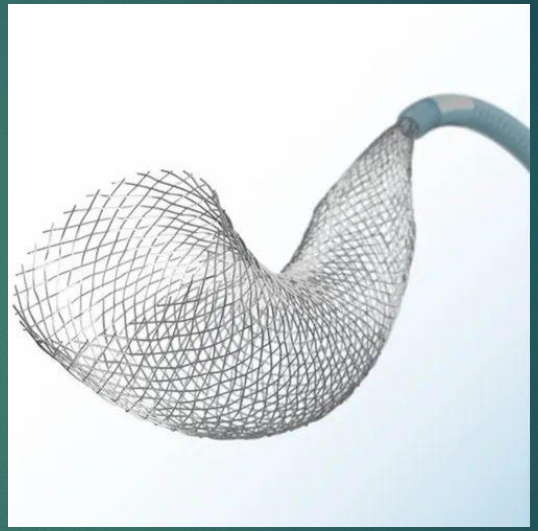
Flow Diverter Stenting of Para ophthalmic ICA Aneurysm

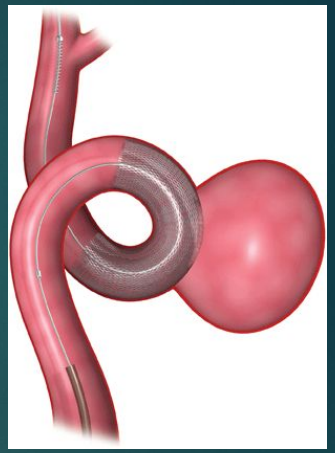
41-YEAR-OLD FEMALE WITH SUDDEN SEVERE SENTINEL HEADACHE

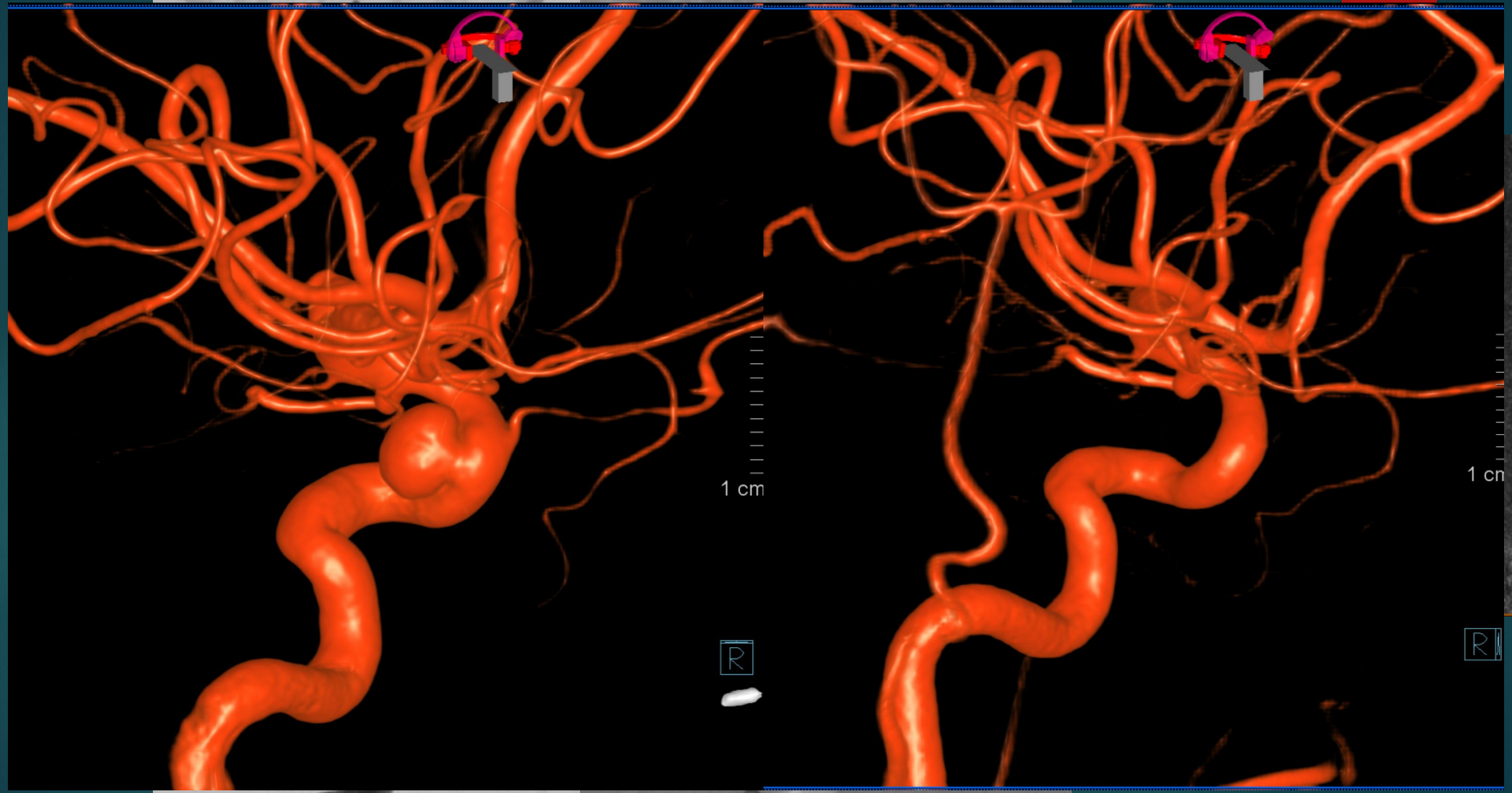
- 41 y.o. female with history of migraine, presented with sudden severe headache
- No SAH on CT head
- No xanthochromia on CSF
- CTA showed a small right paraophthalmic ICA aneurysm

Device

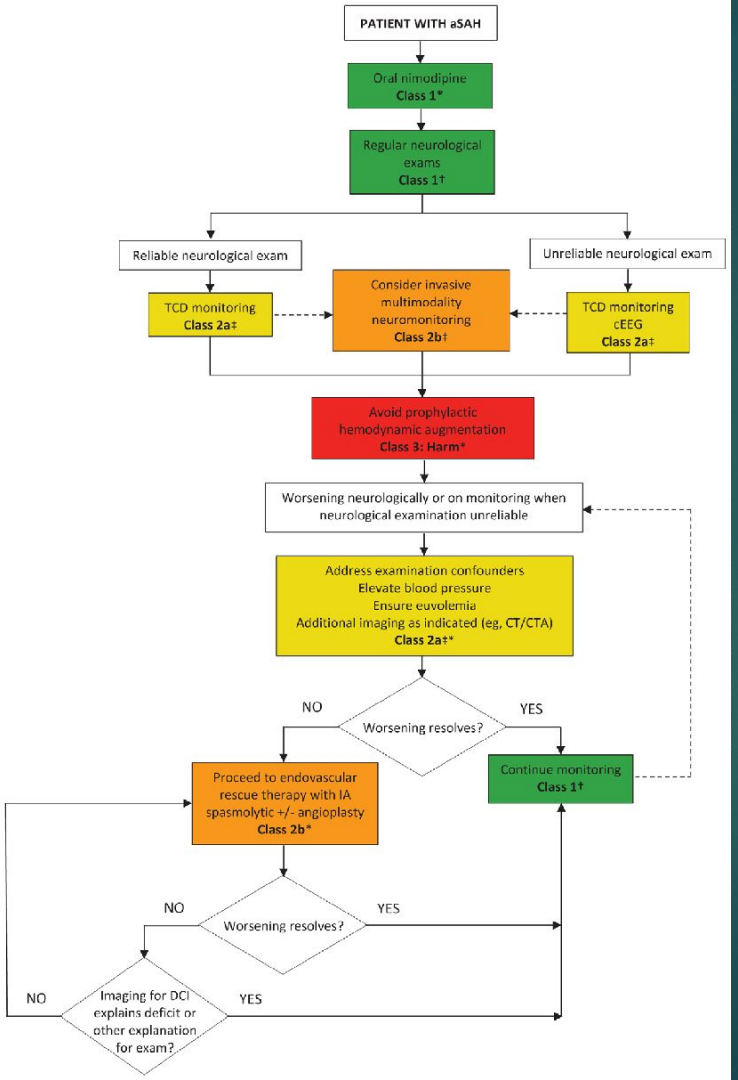
- 6F Shuttle sheath- 80 cm
- 125 cm 5F Vert catheter
- .035 Terumo glide wire
- Phenom plus intermediate catheter
- Phenom 27 microcatheter
- Synchro 14 micro guidewire
- Pipeline FD: 4 mm x 12 mm






1 cm
R
1 cm
R

Vasospasm


PATIENT WITH aSAH
Oral nimodipine
Class 1*
Regular neurological exams
Class 1†
Reliable neurological exam
Unreliable neurological exam
TCD monitoring
Class 2a‡
Consider invasive multimodality neuromonitoring
Class 2b†
TCD monitoring cEEG
Class 2a‡
Avoid prophylactic hemodynamic augmentation
Class 3: Harm*
Worsening neurologically or on monitoring when neurological examination unreliable
Address examination confounders
Elevate blood pressure
Ensure euvolemia
Additional imaging as indicated (eg, CT/CTA)
Class 2a‡*
NO
Worsening resolves?
YES
Proceed to endovascular rescue therapy with IA spasmolytic +/- angioplasty
Class 2b*
Continue monitoring
Class 1†
NO
Worsening resolves?
YES
NO
Imaging for DCI explains deficit or other explanation for exam?
YES

Hydrocephalus

Recommendations for Management of Hydrocephalus Associated With aSAH
Referenced studies that support recommendations are summarized in online Data Supplement 11.

COR	LOE	Recommendations
1	B-NR	1. In patients with aSAH and acute symptomatic hydrocephalus, urgent CSF diversion (EVD and/or lumbar drainage) should be performed to improve neurological outcome.[236,384–387]
1	B-NR	2. In patients with aSAH and hydrocephalus who require an EVD, implementation and adherence to an EVD bundled protocol that addresses insertion, management, education, and monitoring are recommended to reduce complication and infection rates.[388–396]
1	B-NR	3. In patients with aSAH and associated chronic symptomatic hydrocephalus, permanent CSF diversion is recommended to improve neurological outcome.[397–400]
3: No benefit	C-LD	4. In patients with aSAH, routine fenestration of the lamina terminalis is not indicated for reducing the rate of shunt dependency.[401]

Seizure

Recommendations for Management of Seizures Associated With aSAH
Referenced studies that support recommendations are summarized in online Data Supplement 12.

COR	LOE	Recommendations
Patients who present without seizures		
2a	B-NR	1. In patients with aSAH and either fluctuating neurological examination, depressed mental state, ruptured MCA aneurysm, high-grade SAH, ICH, hydrocephalus, or cortical infarction, cEEG monitoring is reasonable to detect seizures.[291,405,406]
2b	B-NR	2. In patients with aSAH and high-seizure-risk features (ie, ruptured MCA aneurysm, high-grade SAH, ICH, hydrocephalus, and cortical infarction), use of prophylactic antiseizure medication(s) may be reasonable to prevent seizures.[407–413]
3: No benefit	B-R	3. In patients with aSAH without high-seizure-risk features (ie, ruptured MCA aneurysm, high-grade SAH, ICH, hydrocephalus, and cortical infarction), prophylactic treatment with antiseizure medication is not beneficial.[392]

Recommendations for Management of Seizures Associated With aSAH (Continued)

COR	LOE	Recommendations
3: Harm	B-NR	4. In patients with aSAH, phenytoin for seizure prevention and/or antiseizure prophylaxis is associated with excess morbidity and mortality.[407–411,413–415]
Patients who present with seizures		
2a	B-NR	5. In patients with aSAH who present with seizures, treatment with antiseizure medications for ≤7 days is reasonable to reduce seizure-related complications in the perioperative period.[411,416,417]
3: No benefit	B-NR	6. In patients with aSAH without prior epilepsy who present with seizures, treatment with antiseizure medications beyond 7 days is not effective for reducing future SAH-associated seizure risk.[408,410,411]

Thank you!

BREAK TIME!

RETURN IN 15 MINUTES

BREAK TIME!

RETURN IN 15 MINUTES

Baptist Health

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Know When to Hold'em

Stroke Case Review

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Stroke Nurse Practitioner

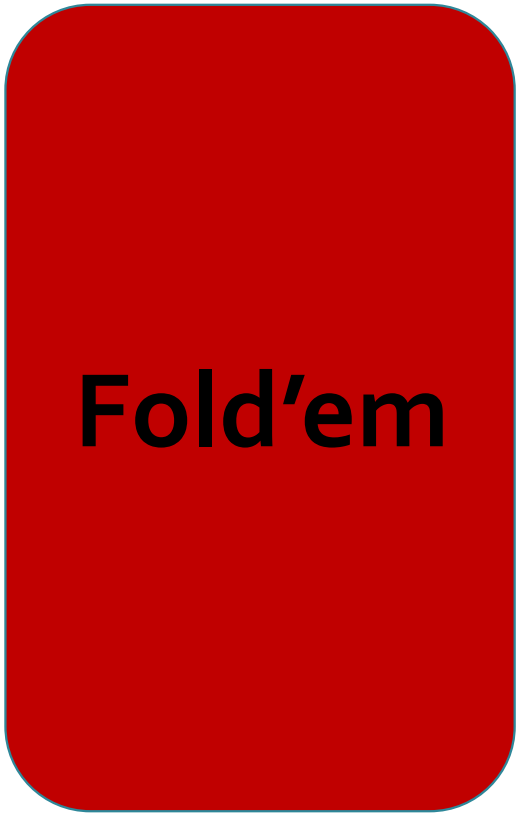
Disclosures

- I have no relevant financial disclosures or conflicts of interest with the presented material in this presentation relationships.

Objectives

- Review stroke cases
- Identify treatment options and select best option
- Discuss risks and benefits of treatment decision

This is requires audience participation!!



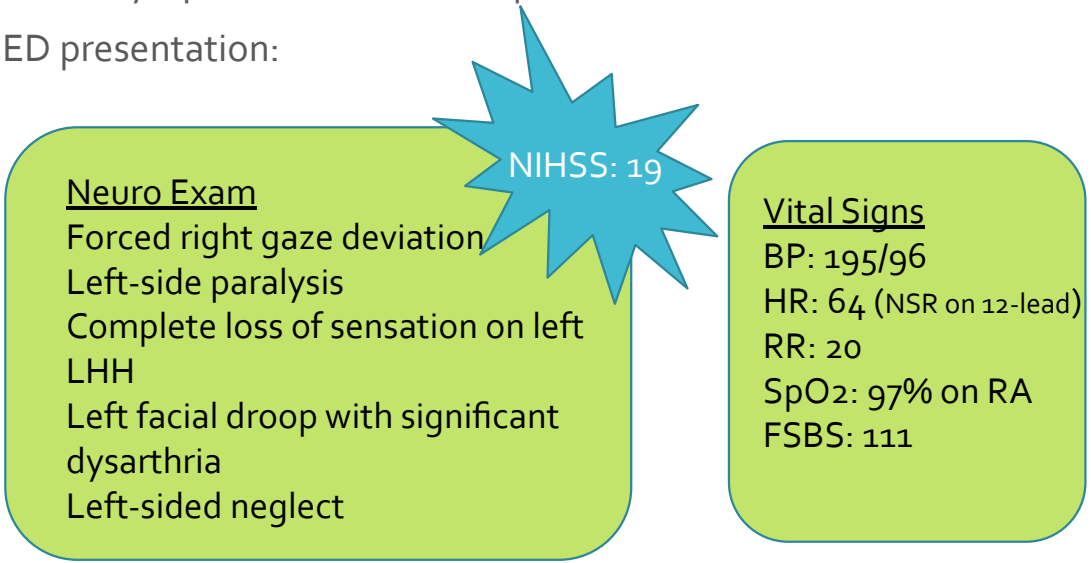
CASE #1

History & Presentation

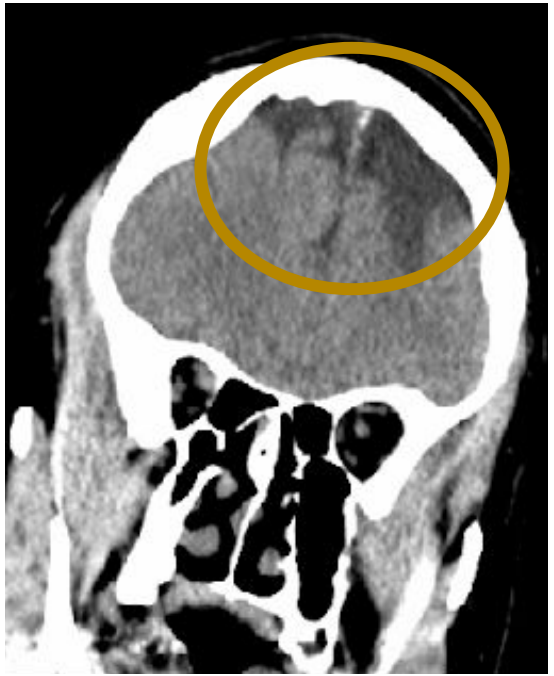
- 58 y/o M presents to the ED from GI office where he underwent EGD with esophageal dilation and post-procedure developed acute stroke-like symptoms
- PMHx: achalasia, HLD, OSA, coronary artery disease, and mitral valve prolapse.
- Medications PTA: atorvastatin, pantoprazole, sertraline, promethazine PRN
- LKWT: 1145 (onset of procedure)
- Code Stroke activation: 1237

Presentation

- GI physician notified ED prior to patient's arrival. Reported routine esophageal dilation without complication. With development of stroke symptoms at the end of procedure.
- ED presentation:

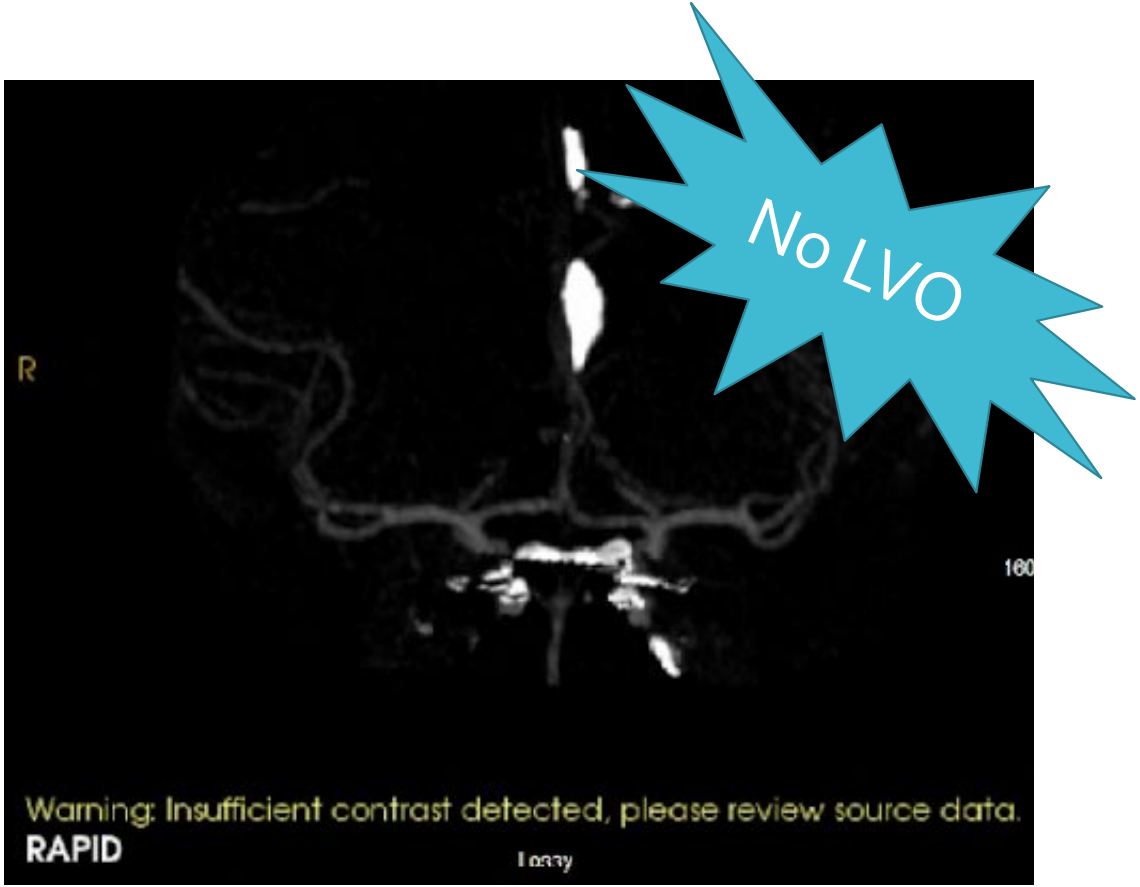


CT Head



CT head: not centered 2/2 forced gaze deviation

CTA


No LVO
R
Warning: Insufficient contrast detected, please review source data.
RAPID

Hold'em or Fold'em #1

- Confirmed with wife history of prior head injury (shot at 6 mo old)
- NIHSS 19 (significantly disabling stroke) without LVO only treatment option is thrombolytics
- 25 mg IV TNK given at 1306

Post TNK Events

- TNK at 1306
- At 1334 notified patient had episode of hematemesis
- Arrived at bedside at 1335 patient remained alert, continued R MCA syndrome, small amount of hematemesis, protecting airway, no acute distress
- Wife reports being told he had a small amount of bleeding during the procedure (not reported by GI prior to TNK)
- Contacted GI physician who performed procedure, who reported that mild bleeding of mucosa is common with dilation and is not life threatening. No need for reversal of anticoagulation
- Fibrinogen: 297

Hold'em or Fold'em #2

- Spoke with GI physician on-call, who was in agreement with not reversing TNK given disabling stroke symptoms
- Plans to monitor and start Protonix gtt

Post TNK Events

- At 1600 developed massive hematemesis and was intubated for airway protection.
- STAT CT Chest revealed small pneumoediastinum (possible esophageal perforation)
- H&H: 13.2/39 at 1312->12.3/35 at 1730

Hold’em or Fold’em #3

OUTCOME

Prior to intubation regained some movement on left.

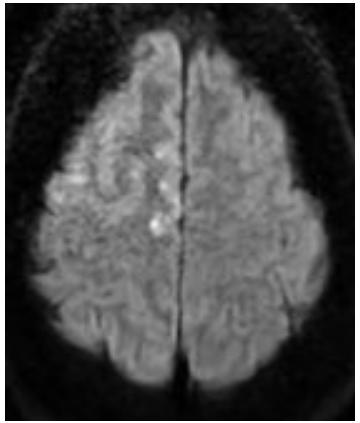
Follow-up imaging of chest negative for extravasation or perforation.

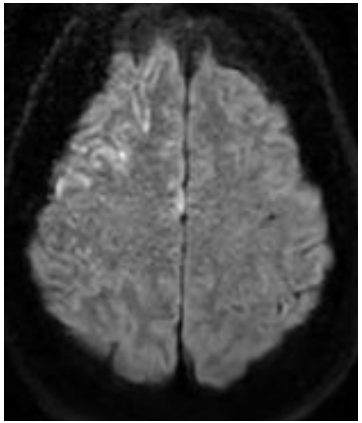
Extubated and transferred to the floor on hospital day 3 with mild left-sided weakness and decreased sensation. Started on ASA 81 mg

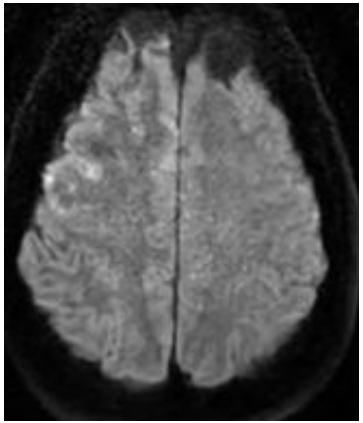
Hospital day 4 continued improvement weakness/sensation (LUE: 4/5, LLE: 4+/5)

Discharged home on day 5

2 days post discharge: on the golf course!



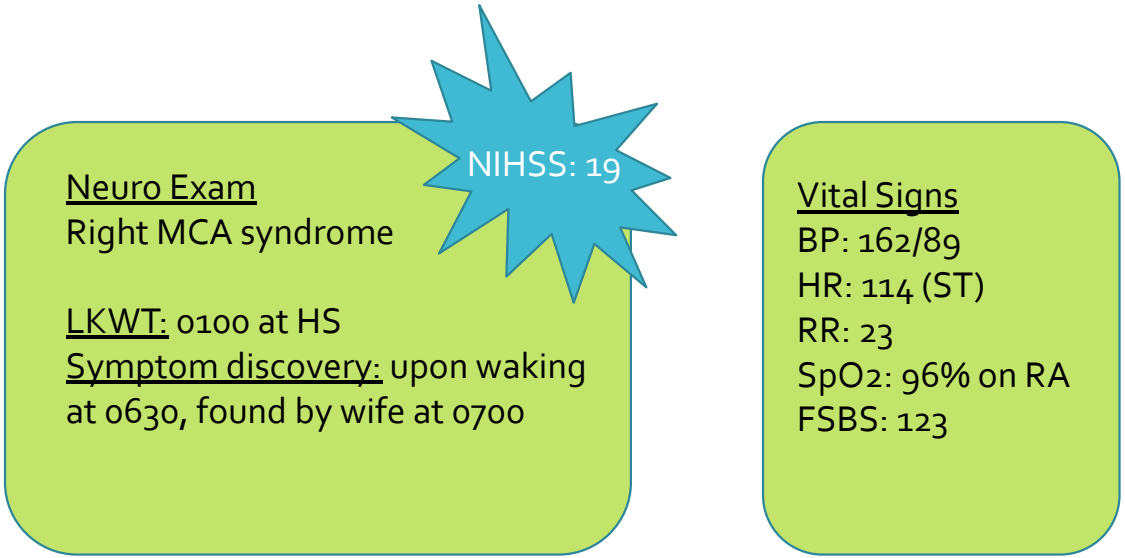




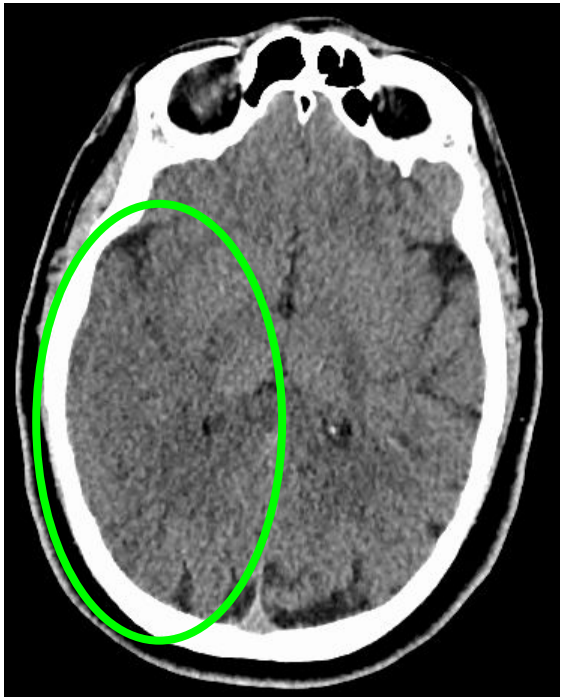
CASE #2

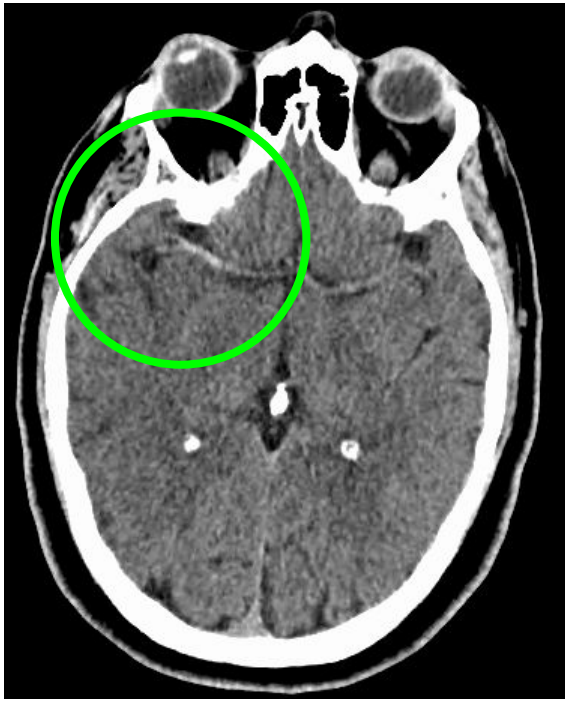
Patient Presentation

- 50 y/o M with PMHx of tobacco abuse, history of Hepatitis C s/p treatment, arrives to OSH:

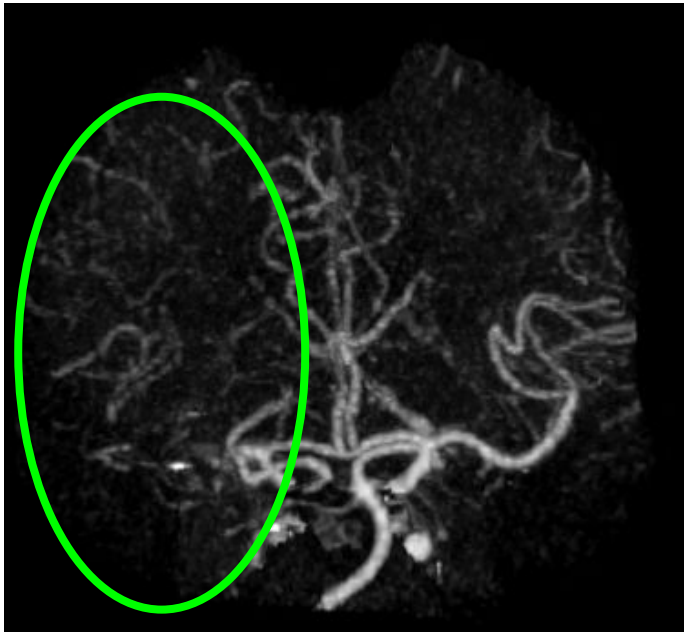


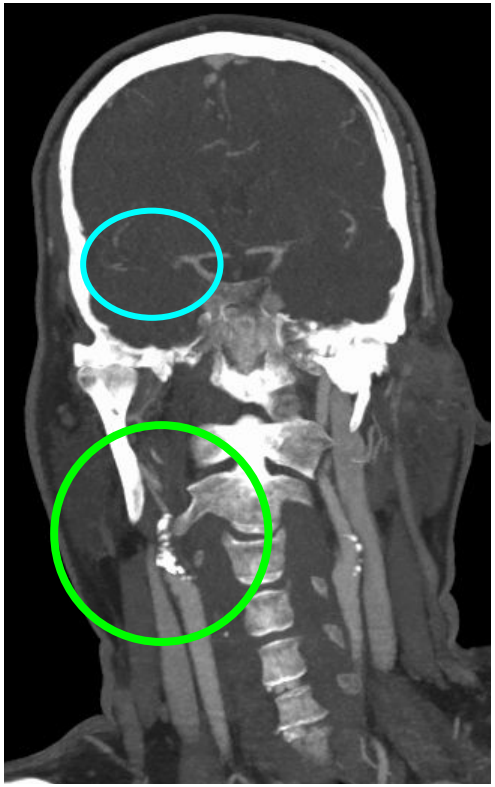
OSH Imaging-CT Head 0816



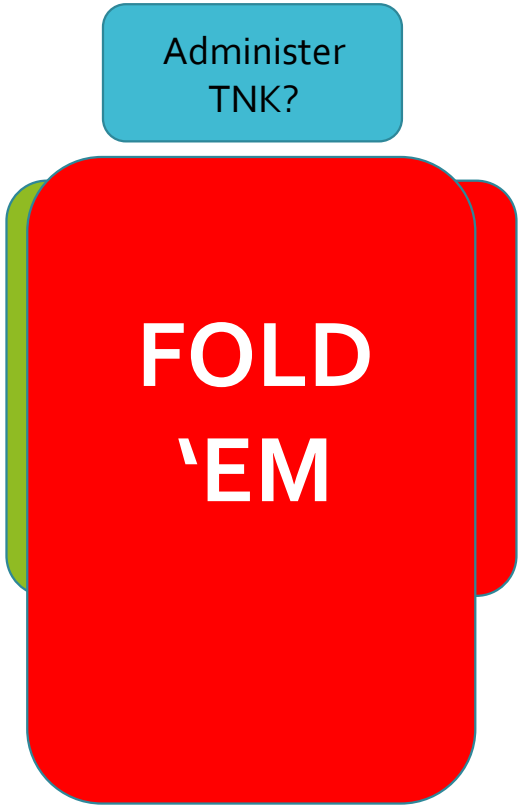


OSH Imaging-CTA





Hold'em or Fold'em #4



- LKWT >4.5 hours
- Large area of ischemic change in R temporal lobe, and insular ribbon

Neuro Exam on Arrival to LR

Neuro Exam

- Alert and oriented x4
- Left-sided paralysis w/ no sensation
- Forced right gaze deviation
- LHH
- Left facial droop with significant dysarthria
- Left-sided neglect

NIHSS: 19

Vital Signs

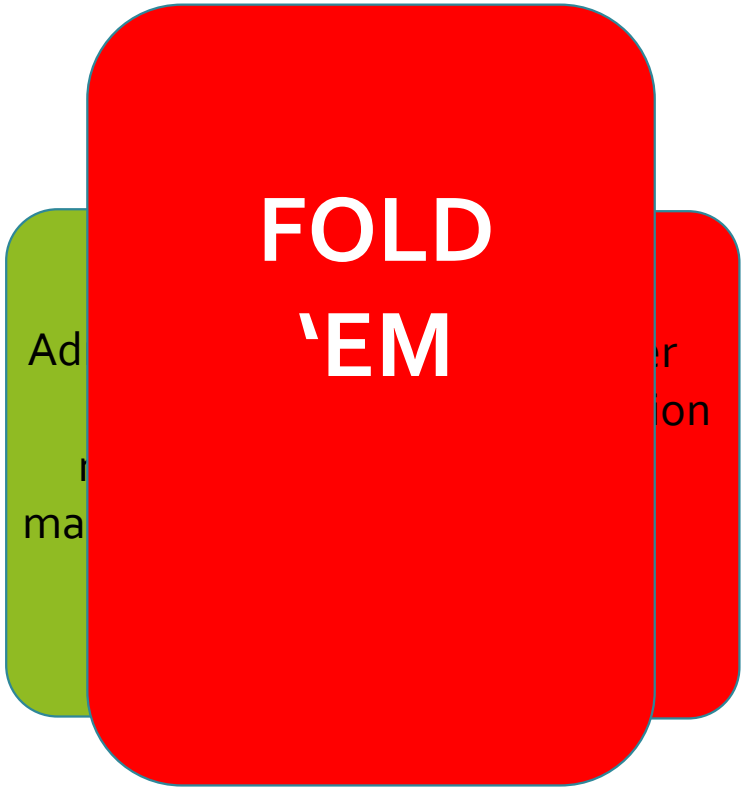
BP: 165/79
HR: 114 (ST)
RR: 19
SpO2: 95% on RA
FSBS: 118

Timeline

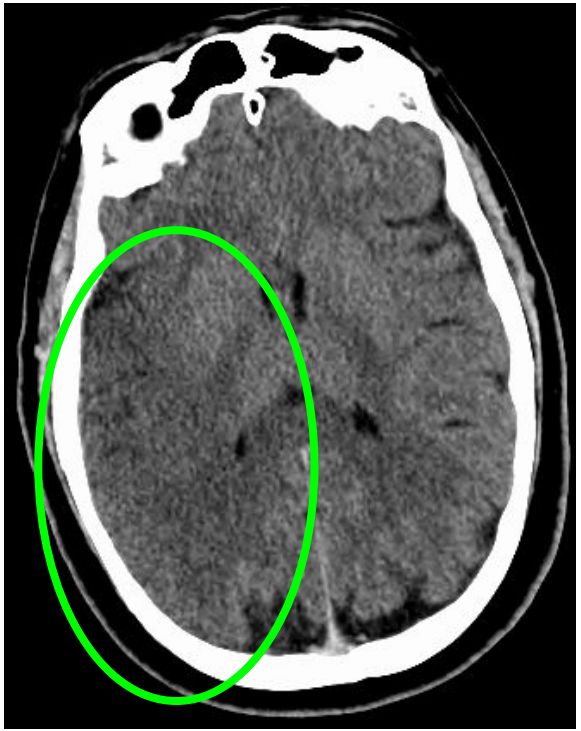
- Code Stroke Initiated: 1021 (ETA 1045)
- Patient Arrival: 1037
- Stroke Team Arrival: 1040
- LKWT: 0100

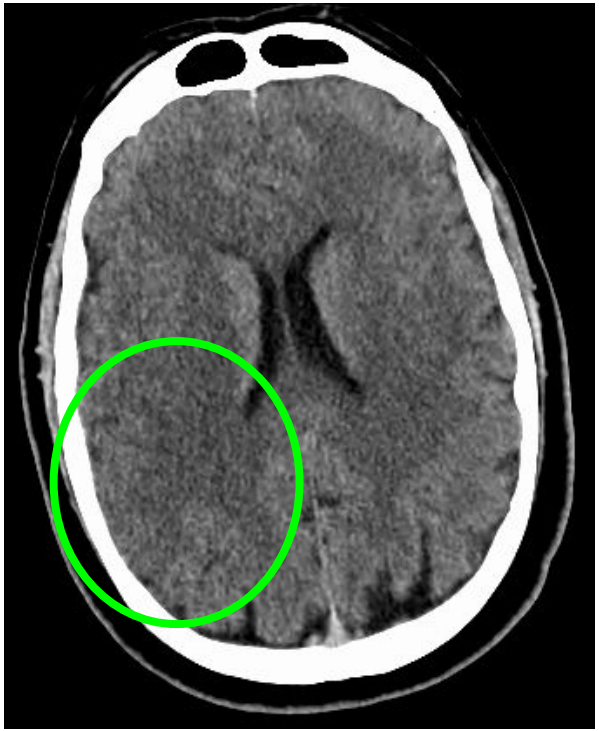
Hold'em or Fold'em #5

Recap: 50 y/o M arrives at your facility at 1040 with severely disabling stroke symptoms with known R ICA occlusion and tandem R M1, with LKWT of 0100 that morning (>9.5 hours)

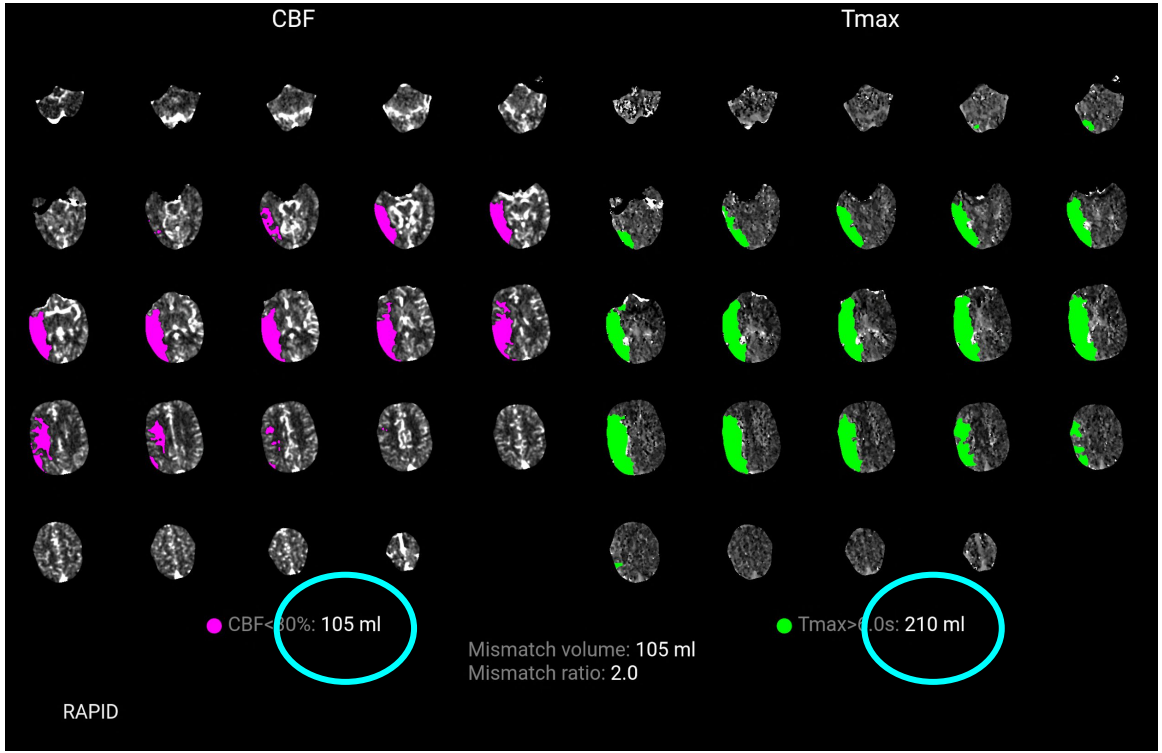


Repeat CTH 1046

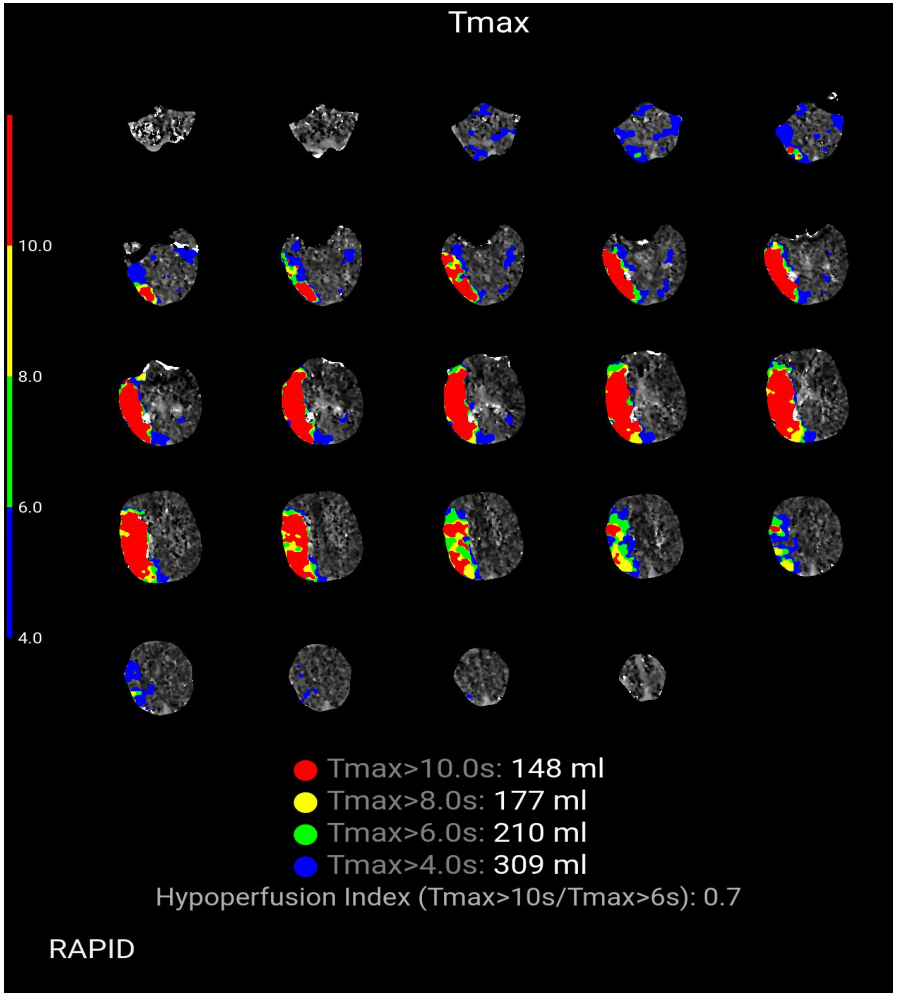




CT Perfusion 1046 (1057)

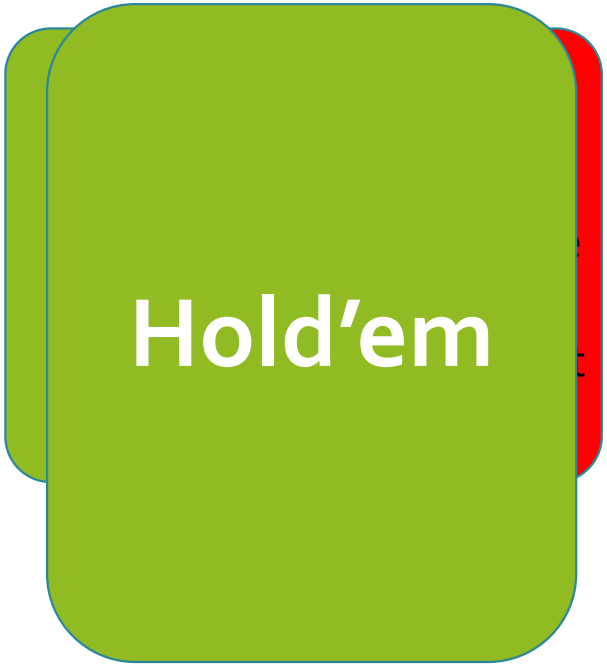


CT Perfusion



Hold'em or Fold'em #6

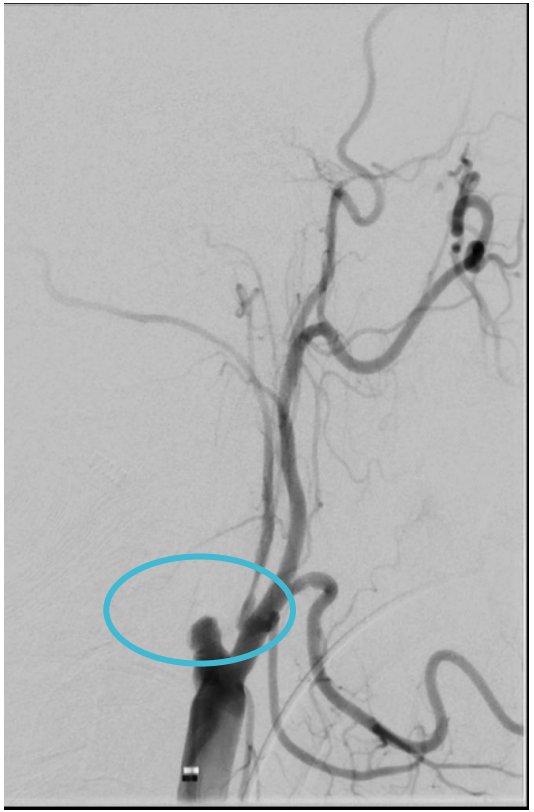
Proceed with Thrombectomy?



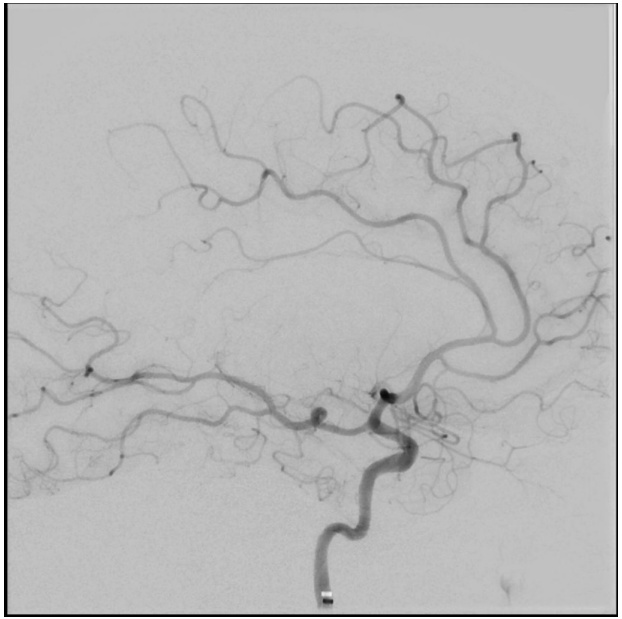
Spoke with patient and his wife.
Discussed risks and benefits of thrombectomy in the setting of large stroke, specifically hemorrhagic transformation (~20%)

Ensured understanding that procedure was unlikely to improve deficits but may prevent malignant edema and need for hemicrani (which patient does not meet criteria for).

Mechanical Thrombectomy

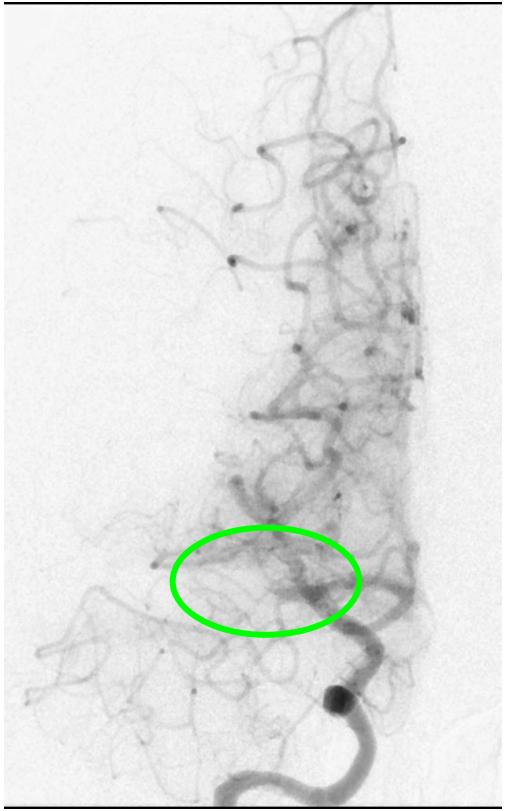


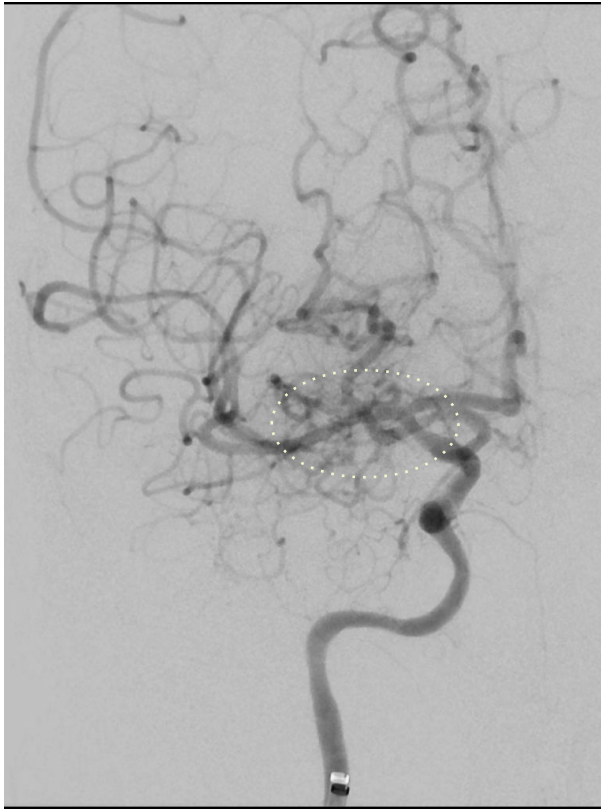
R ICA



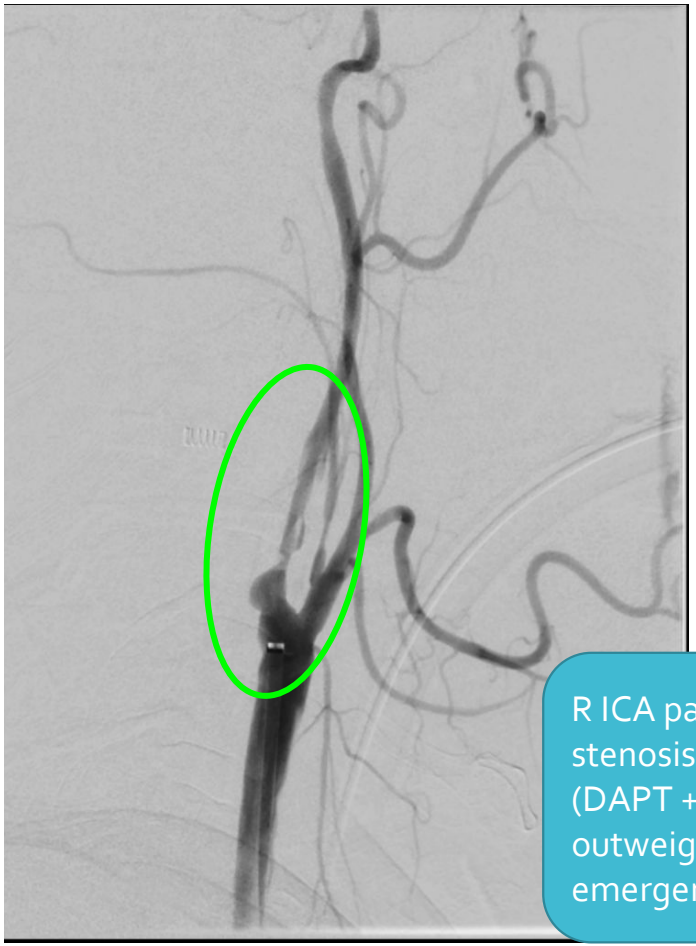
s/p angioplasty of R ICA

Mechanical Thrombectomy





Mechanical Thrombectomy



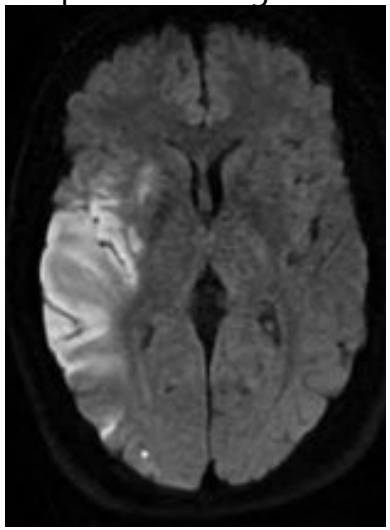
R ICA patent with residual stenosis. Risk of bleeding (DAPT + large stroke) outweighs benefit of emergent stenting.

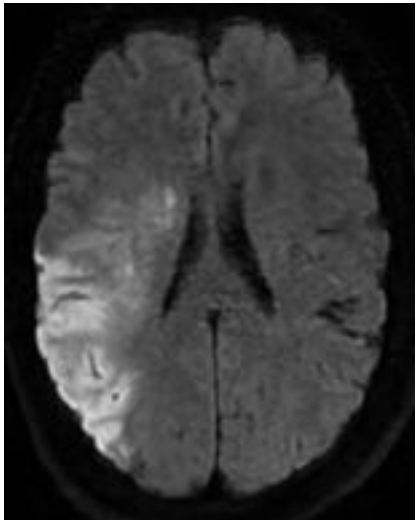
Outcome

Post-procedure day 1: resolution of dysarthria, LUE: 5/5, LLE: 4+/5. Sensation intact to LT, but continues to have left-sided hemi-inattention. Visual fields full to confrontation with no gaze preference or deviation.

Day 2: ambulated in ICU with PT. Continued left-sided hemi-inattention

Day 5: discharged home with OP PT, on ASA 81 (plans for DAPT after repeat CTH in 2 weeks without hemorrhage), and plans for R ICA stenting 4-6 weeks post-discharge





Questions??

BREAK TIME!

RETURN TO MAIN ROOM AT 2:05PM

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