Subarachnoid Hemorrhage

- Ant circulation : 2ICA, 2MCA,2ACA. Post circulation: 2PCA,2VA , basilar
- Traumatic or **Spontaneous** : what we will talk about… aneurysms, AVM, Tumor, Infx,

Mcc at adult Mcc at child

1) Intracranial Aneurysms

F:M 3:2 .. peak of rupture 5-10 yrs ….. can be congenital or acquired / atherosclerosis, hemodynamic.S, HTN

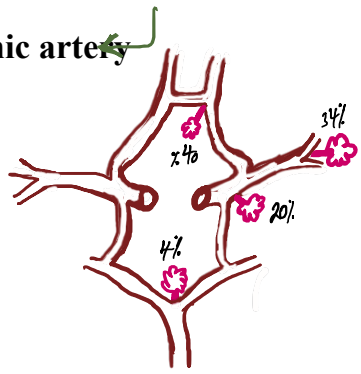
- Risk factors: smoking, alcohol consumption ….The rate of rupture is directly related to the size of the aneurysm

1] BERRY aneurysms.

- called secular and congenital.
- range in size .. if >2.5cm called **giant aneurysms.**

Mass effect, no rupture, **ophthalmic artery**

+ retro-orbital pain.



2] FUSIFORM aneurysms

- due to atherosclerotic.
- PC mainly **basilar artery**.
- No rupture, sends emboli through thrombi/ dissection.

3] MYCOTIC aneurysms

– infx/ bacterial endocarditis

– which will weak the wall

–commonly in **Rt.MCA**

–strep/staphylococci

More in distal / peripheral As

4] TRAUMATIC aneurysms

-in bullet injury… weak wall

-in **ICA** >> within **cavernous sinus**

If rupture >> No SAH,

Carotid cavernous fistula

Bradycardia, hypertension
Hemiparesis & Anisocoria

History

- At bifurcation >> weaks vs + stress due to blood flow
- Risk Factors: HTN, OCP,Smoking, Atherosclerosis, Pregnancy, Vigorous exercise
- The larger/+ Proximal .. aneurysm more likely to rupture
- Presentation :

a) Headache
- Sudden onset
- Sentinel Headache
- 25% of cases

b) LOC.
- ↑ ICP > CPP
- ↑ BP to maintain flow don't try to ↓ it
- prevent ischemia

c) meningism.
- Blood will irritate Meninges
- Neck Rigidity + photophobia + vomiting + fever
- or to Theca → sciatica, LBP

d) seizure.
- Blood irritate the cortex

e) mass effect
- if associated with hematoma or edema

f) NDs
- early → due to the Mass
- late → due to Ischemia from vasospasm

g) Visual Manifestation
- papilledema + Retinal H.
- 6th CN palsy

Diagnosis >> 1- clinical suspicion!!

LOC / headache / Meningism

2- Non contrast CT → Blood in sulci& cisterns → Seen until ~72 hrs / 3days → إذا كان فيه SDH أو intracerebral صعب يبين

3- LP → Show blood, xanthochromic → Seen until 14 days → Use 3 / 4 tubes → عشان نتأكد انه مش من ال procedure

clinical grading of SAH

- To detect survival + way of management

The Hunt and Hess Grading System ~ old, Subjective

Grade 1	Asymptomatic or minimal headache and slight nuchal rigidity
Grade 2	Moderate to severe headache; neck stiffness; no neurologic deficit except cranial nerve palsy
Grade 3	Drowsy; minimal neurologic deficit
Grade 4	Stuporous; moderate to severe hemiparesis; possibly early decerebrate rigidity and vegetative disturbances
Grade 5	Deep coma; decerebrate rigidity; moribund

→ for prognosis

The WFNS Grading System ~ New, objective

	GCS	MOTOR
Grade 1	15	No motor deficits
Grade 2	13-14	Without deficit
Grade 3	13-14	With focal neurological deficit
Grade 4	7-12	With or without deficit
Grade 5	3-6	With or without deficit

Grade 4, 5 → like Sever Head injury → ↑ M. Rate

The Fisher Scale ~ According to Blood's Amount → بتحدد امتى رح يصير Vasospasm خلال ال Management

Grade 1	No subarachnoid (SAH) or intraventricular hemorrhage (IVH) detected → May at late time
Grade 2	Diffuse thin (<1 mm) SAH. No clots
Grade 3	Localized clots and/or layers of blood >1 mm in thickness. No IVH.
Grade 4	Diffuse or no SAH. ICH or IVH present

→ For complication ± Vasospasm

All 3 systems → determine the indication & time for surgery

Management

Stabilization of pt >> manage ICP >> prevent Complication >> find the source >> prepare surgery > TX

- Stabilization of pt:
  - codeine phosphate for headache
  - Laxative to prevent straining
  - IV ~ saline
  - Foleys
  - Do full invest. & phenytoin 3/days
- prevent Complication:
  - CCBs
  - cyclokapron ~ Antifibrinolytic
- find the source:
  - cerebral Angiography ~the Main stay → & Know location, size, shape, orientation
  - DSA, CT, MRA
- TX:
  - craniotom & clipping → Grade 1-3
  - Endovascular obliteration → Grade 4-5

➡️ Complications:

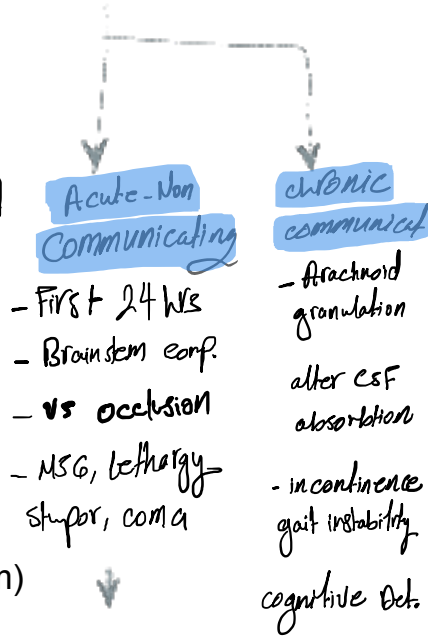
Rebleeding

- Most dreaded
- within 24 hrs ~ 4 days
- 19% at 2 weeks
- 78% Mortality R.
- due to fibrinolytic activity in CSF

Vasospasm.

- at the base of the Brain
- 70% of pts
- LOC + NDs
- Terminal ICA, proximal MCA, ACA
- after 4 days of onset

Hydrocephalus



2) AVM's

- result in both intracerebral hemorrhage and SAH.

- Small AVMs (< 2.5 cm) rupture more frequently than large AVMs (> 5 cm)

- AVM tends to rupture less frequently than aneurysms

- Presentation :

- SAH / by the smaller lesions.
- Seizures / by the larger lesions.
- Recurrent headaches / 30%.
- Neurological deficits due to ischemia or pressure / 20%

- AVM are treated by excision, or embolization or radiotherapy by the Gamma Knife or a combination of any depending on grading system