SUBARACHNOID HAEMORRHAGE

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Cerebral aneurysms
EPIDEMIOLOGY

- Spontaneous SAH affects 6-9 people per 100000 per year (~6% of all strokes)
- Intracranial aneurysm ~85%; Perimesencephalic NASAH~10%; ~5% other
- Incidence increases with age, commonest ages 40-60
- 1.6 x higher in women; 2.1x higher in Afro-Carribeans
RISK FACTORS

• Hypertension
• Smoking
• Excessive alcohol consumption
• Illicit drugs - cocaine

• Genetic disorders- APKD, EDS IV, NF 1
• Familial- accounts for ~10%
  • First degree relatives 3-7x risk compared to general population
ANEURYSMS

- Prevalence of ~4%
- Most <7mm don’t rupture but grow unpredictably
- 85% on Circle of Willis
- Multiplicity - 30%
- Saccular
PRESENTATION

- Sudden onset explosive headache
- Neck stiffness
- Nausea & vomiting
- Sensitivity to light (photophobia)
- Blurred/double vision
- Stroke-like symptoms (weakness, slurred speech)
- Loss of consciousness
- Seizures
INVESTIGATIONS

- CT Brain: 95-98% sensitive within 24 hours of symptom onset
- CTA Brain: contrast enhanced CT of blood vessels
- Cerebral catheter angiogram- injecting contrast through a catheter to brain arteries
- Lumbar Puncture
- MRI
MANAGEMENT

• Supportive: neurosurgical unit, anaesthetic support, medications

• Initial aim: prevent rebleed! After 24 hrs rebleed risk is ~40% over 4 weeks. 51-80% mortality

• Open surgical clipping vs endovascular coiling

• Prevent secondary complications
  • Hydrocephalus
  • Vasospasm | delayed cerebral ischemia
COMPLICATIONS

• Not all patients can be saved - 50% mortality including those who die pre-hospital (~10-15%)
• Vasospasm: serious & common complication (30%) leading to ischemic brain injury
• Hydrocephalus: short term & long term
• Epilepsy ~5%
• Multi-organ failure
PROGNOSIS

- Prognosis/outcome related to initial presentation, age, amount of blood on CT
- Improvement: 4-18 months post SAH
- Cognitive impairment in 46% affecting QoL
- Headaches- 60%  Hormonal dysfunction-25%
- Extreme tiredness, personality changes, depression, anxiety, sleeping problems
- Complete recovery without psychosocial/neurological problems ~25%
An Insight into Interventional Neuroradiology
Surgical Clipping

Endovascular coiling

ISAT : International Subarachnoid Aneurysm Trial 2002
Coiling > clipping
The angiography suite
‘Coiling’
Difficult aneurysms: Balloon Remodelling
Stents in Cerebral Aneurysm Treatment

Stent assisted coiling

Flow diverting stent
Stent assisted coiling

ASPIRIN 6 months / CLOPIDOGREL 8 weeks
Flow diverting stents (Queen Square)

SILK (Balt, Fr)

PIPELINE (eV3, US)
Flow diverting stent

ITU 24 hours / SC Heparin / IV Fluid haemodilution
ASPIRIN 6 months / CLOPIDOGREL 3 weeks
Cerebral AVM Treatment - Multidisciplinary

Disconnect AV shunt

Surgery:
  superficial / non-eloquent

Gamma knife:
  smaller AVMs
  low bleeding risk
Endovascular: liquid embolic agents

**Glue**
- n-Butyl-2 Cyanoacrylate (tissue adhesive)
- Mixed with Lipiodol

**ONYX**
- EVOH (ethylene vinyl alcohol) copolymer dissolved in DMSO (dimethyl sulfoxide), suspended micronized tantalum powder
Any Questions?