Calderdale and Huddersfield NHS Foundation Trust

ED Case of the week

Learning points

- Risk assessment of patients with potential SAH
- ED Management of SAH

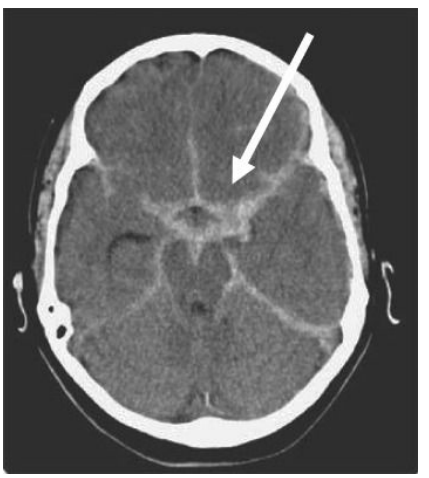
The Case:

- 60M with no significant PMH presented with BP 180/100 and headache. He was treated with amlodipine and BP came down to 140 systolic.
- He was discharged but represented 2 days later due to worsening headache and persistent vomiting for the last 24 hours.
- He was GCS 15 with a normal neurological examination
- However, he could not flex his neck. Lateral rotation at the neck was normal but neck flexion extremely limited.
- A CT head showed diffuse SAH. Fisher grade III. Concern for an anterior communicating artery aneurysm on plain CT.
- Subsequent CTA showed no aneurysm.
- Treated with anti emetic, analgesia. Referred to Neurosurgery in Leeds where he was transferred for ongoing care.

So what can we learn from this case?

- Headache is a common presentation to ED (~1-2% of presentations) but thankfully SAH is rare (~1% of headache presentations to ED).
- With a ~65% untreated mortality rate we mustn't miss these patients.
- We all know to suspect it in 'sudden onset, thunderclap headaches' but is there any other way to risk stratify these patient?

'Star of death' appearance of SAH



Diagnosis

This Paper provides an excellent overview and summarises the red flags:

- Peak severity 5 mins to within 1 hour
- **Vomiting (our case)**
- **Neck pain (our case)**
- Seizures
- Exertional / coital onset
- Syncope
- But 50% will have a normal neurological examination!

Risk stratification

The challenge for ED is deciding who needs a work up and who doesn't.

We can use The Ottowa Rules

This paper externally validates the Ottowa rule in the UK with sensitivity of 100%.... But a specificity of only 22% highlighting the diagnostic challenge!

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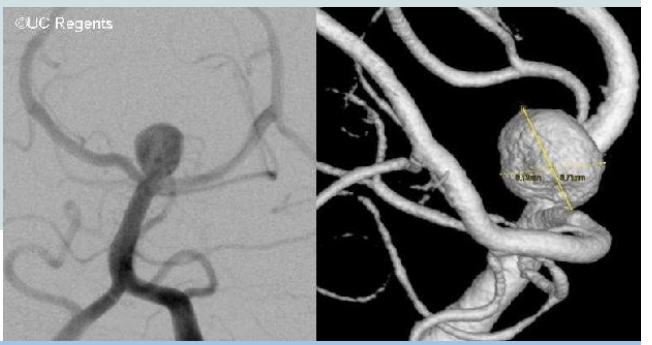
Investigation for SAH

- CT is the imaging choice for diagnosis of SAH
- When performed within 6 hours of headache onset a normal CT effectively excludes SAH (Miss rate 1/1000).
- This paper even suggests a 100% sensitivity at 24 hours and a 99% sensitivity at 48 hours for modern CT scans, though general consensus remains at 6 hours as the cut off for exclusion.
- And a negative CT >6 hours after headache onset? Requires LP!
- Summarised in NICE guideline on EMbeds

Types of SAH

- Traumatic vs non traumatic
- Non traumatic:
  - 85% are aneurysms
    - Often a genetic element with 3-5 fold risk if first degree relatives have had SAHs
    - Link with conditions such as Autosomal dominant polycystic kidneys and connective tissue disorders such as Ehlers-Danlos
  - Non aneurysmal causes:
    - Cocaine / amphetamine use
    - Vasculitides
    - Sickle cell
    - Clotting disorders



Aneurysm on angiogram and reconstruction

Management

- Usual A-E approach
  - Intubation for airway protection if required
  - Beware neurocardiogenic stunning - cardiac monitoring is required and BP support may be required
  - ECG Changes with SAH! Can mimic MI / STEMI
- Prevention of secondary brain injury:
  - Head up nursing, 30 degrees
  - Treat hypertension - analgesia, nimodipine (or SNP in ICU environment)
  - Avoid hyper / hypoglycaemia
  - Correct coagulopathy
  - Treat seizures
- Aneurysm treatment - coil / clip
- Summarised on LITFL