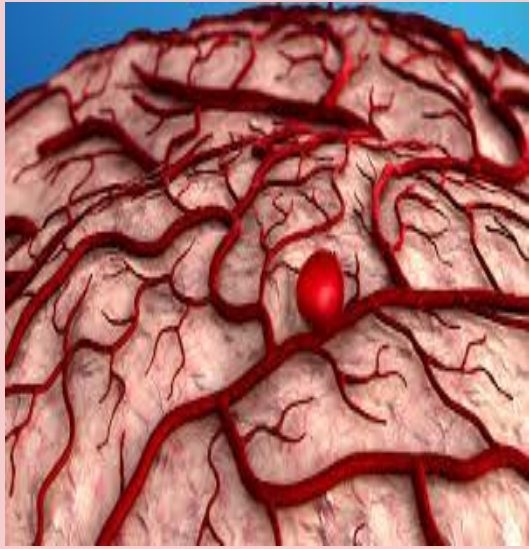
SECONDARY HEADACHE ATTRIBUTED TO VASCULAR DISORDER



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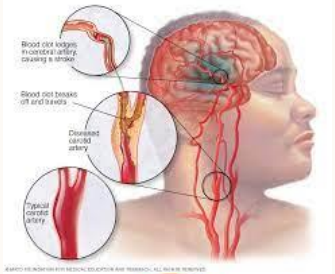
MYANMAR

CONTENTS

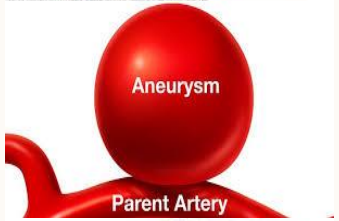
SECONDARY HEADACHE ATTRIBUTED TO VASCULAR DISORDERS

IHS Classification ICHD-3

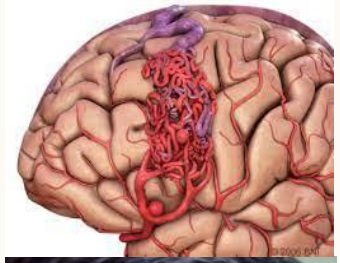
1. Headache attributed to **Cerebral ischemic event**(cerebral infarction, TIA)



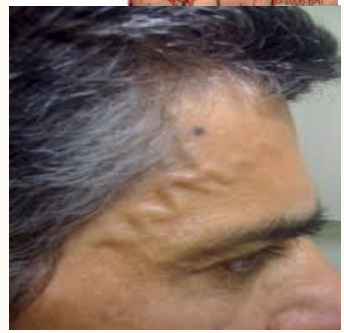
2. Headache attributed to **Nontraumatic intracranial hemorrhage**(SAH, ASDH)

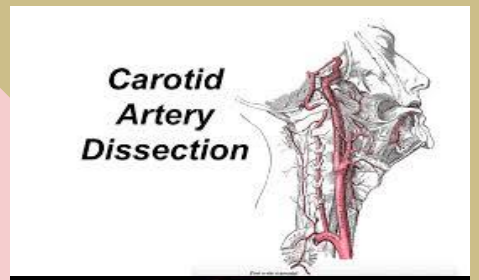


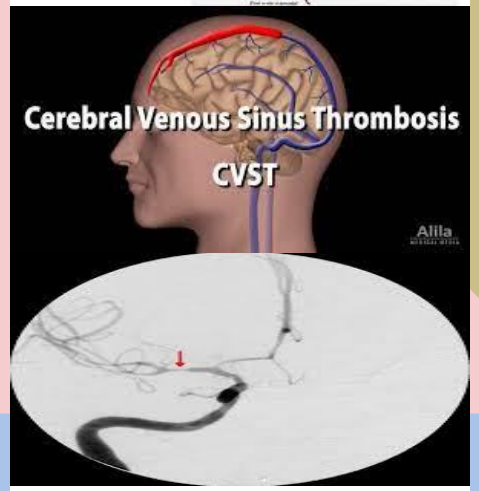
3. Headache attributed to **Unruptured vascular malformation**(AVM, DAVF)

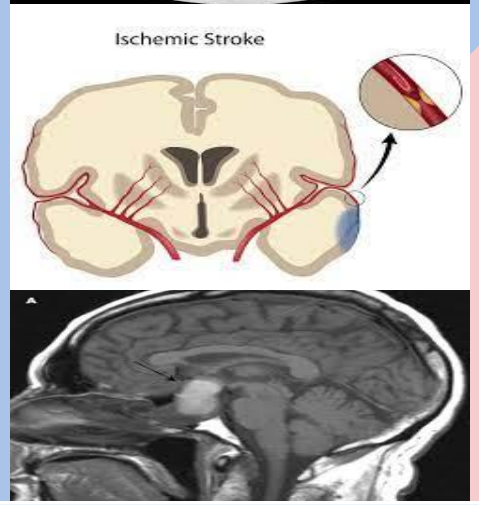


4. Headache attributed to **Arteritis**(GCA, ACNS both primary, secondary)









5. Headache attributed to **Cervical carotid or vertebral artery disorder**(Cervical carotid or vertebral **artery dissection**)

6. Headache attributed to Cranial **Venous** disorder(**CVT**)

7. Headache attributed to Other **acute intracranial arterial disorder**(**RCVS**)

8. Headache attributed to **Chronic intracranial vasculopathy** (**CADASIL**, MELAS,MMA,CAA)

9. Headache attributed to **Pituitary apoplexy**

CASE STUDY

- A 55-year-old housewife
- Had a **very severe** headache as
- a **sudden-onset** **reaching its maximum intensity** within a **minute**
- about **three days ago** had initially **nausea** and had **vomited** a few times was admitted to a nearby hospital.

- She describes her headache as being

  worst headache of her life & striking suddenly like

  a clap of thunder

- does **not recall any trigger**.

- **No** history of head and neck **trauma**

- **No** preceding history of **strenuous activities, straining**
- **No preceding** history of **headache**
- Her past medical and neurological histories are insignificant
- Drug history (-)

Examination

- level of consciousness = 15/15
- her blood pressure is found to be 130/80 mmHg.
- neck stiffness (-)
- Her physical and neurological & neuro-ophthalmologic exams were noted as being **normal**, including **normal fundi**

- she was given symptomatic **analgesic** therapy.
- Symptoms were **not relieved**
- Arrange an emergency **CT scan**.

APPROACH TO DIAGNOSIS

- **Headache** is one of **the most common** reasons for presentation to the **Emergency Department**.
- **Most** of the Headaches are **benign**
- but the **life-threatening causes** of headache should be **considered**

Nieuwkamp DJ, Setz LE, Algra A, et al. *Lancet Neurol.* 2009;8(7):635–42.
Kowalski RG, Claassen J, Kreiter KT, et al. *JAMA.* 2004;291(7):866–9.

- **sudden-onset,**
- **severe headache**
- **for the "first time or new headache in life or the worst headache in life"**

- needs to rule out the probability of "**a life-threatening disorder**" such as;

❖Subarachnoid hemorrhage (SAH)

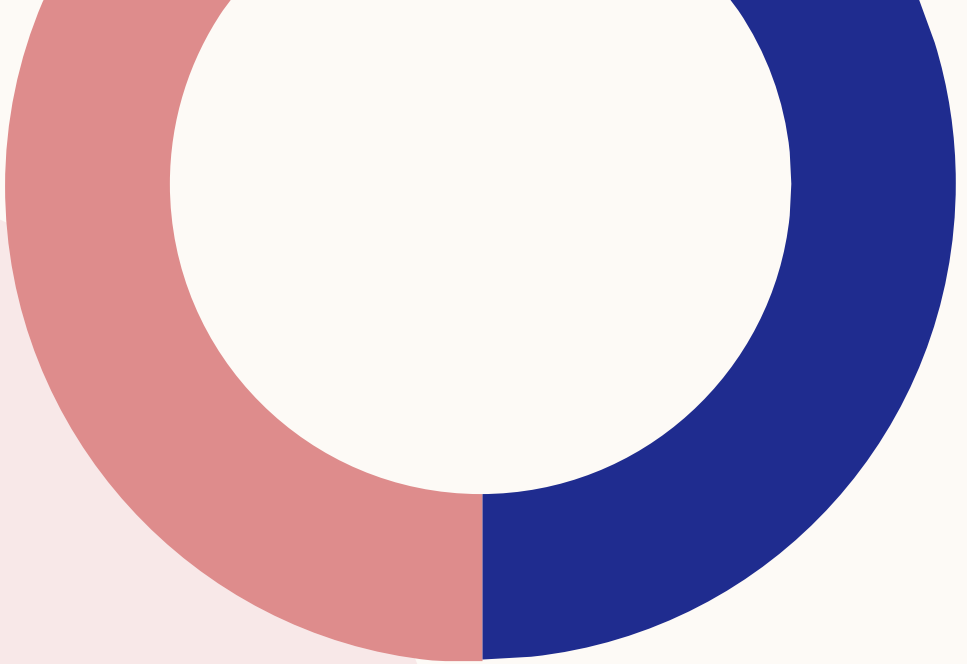
❖Arteriovenous malformations

❖Dural arteriovenous fistula

❖Pituitary apoplexy

Nieuwkamp DJ, Setz LE, Algra A, et al. *Lancet Neurol.* 2009;8(7):635–42.
Kowalski RG, Claassen J, Kreiter KT, et al. *JAMA.* 2004;291(7):866–9.

- Cervical-cephalic arterial dissection,
- Cerebral venous thrombosis,
- Reversible cerebral vasoconstriction syndrome,
- Spontaneous intracranial hypotension,
- Some other intracranial pathologies.



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Kowalski RG, Claassen J, Kreiter KT, et al. *JAMA.* 2004;291(7):866–9.

- Headache caused by **a subarachnoid hemorrhage (SAH) from a ruptured aneurysm** is
- one of the **most deadly**,
- with a median **case-fatality** of **27–44%**.

- **Careful assessment** leading to the **detection of a SAH** as the cause of headache can significantly **decrease** our patients' **mortality**.

- If this were an easy task, the **12% misdiagnosis** rate would not exist.

APPROACH TO DIAGNOSIS OF NON-TRAUMATIC SAH

History

- Non-traumatic
- sudden-onset
- very severe headache reaching maximum intensity within minutes or an hour
- for the “first time or new headache in life”, the worse headache in life

“ Thunderclap headache ”

SYMPTOMS OF SAH

A thunderclap headache, which is a very intense and painful headache that comes on suddenly.

Additional symptoms can include:

Decreased consciousness and alertness.

Nausea and vomiting.

Stiff neck.

Sudden weakness.

Dizziness.

Numbness in part of your body.

Muscle aches, especially in your neck and shoulders.

Eye sensitivity in bright light.

Seizures.

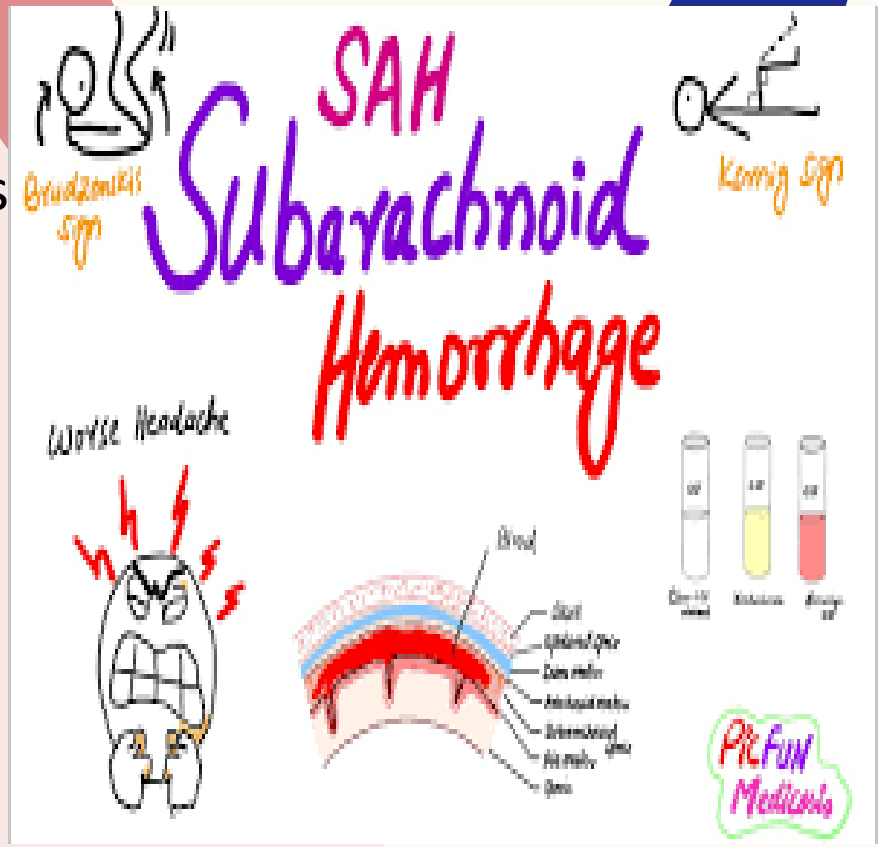
Mood and personality changes, including confusion and irritability.

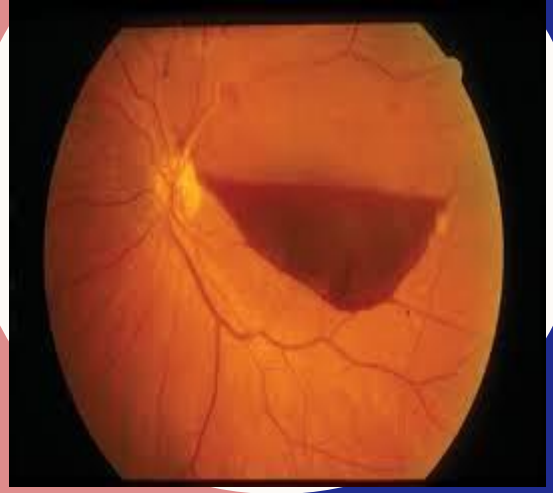
Vision changes, including double vision, blind spots or temporary vision loss in one eye.

APPROACH TO DIAGNOSIS

Physical examination

- Signs on **physical and/or neurological** examinations
- **high blood pressure**
- any **change of consciousness**
- **neck stiffness**





- neuro-**ophthalmologic** findings
- **lateralizing signs**, or any other findings
- The probability of **finding a craniocervical pathology** should be referred for an **emergency imaging.**

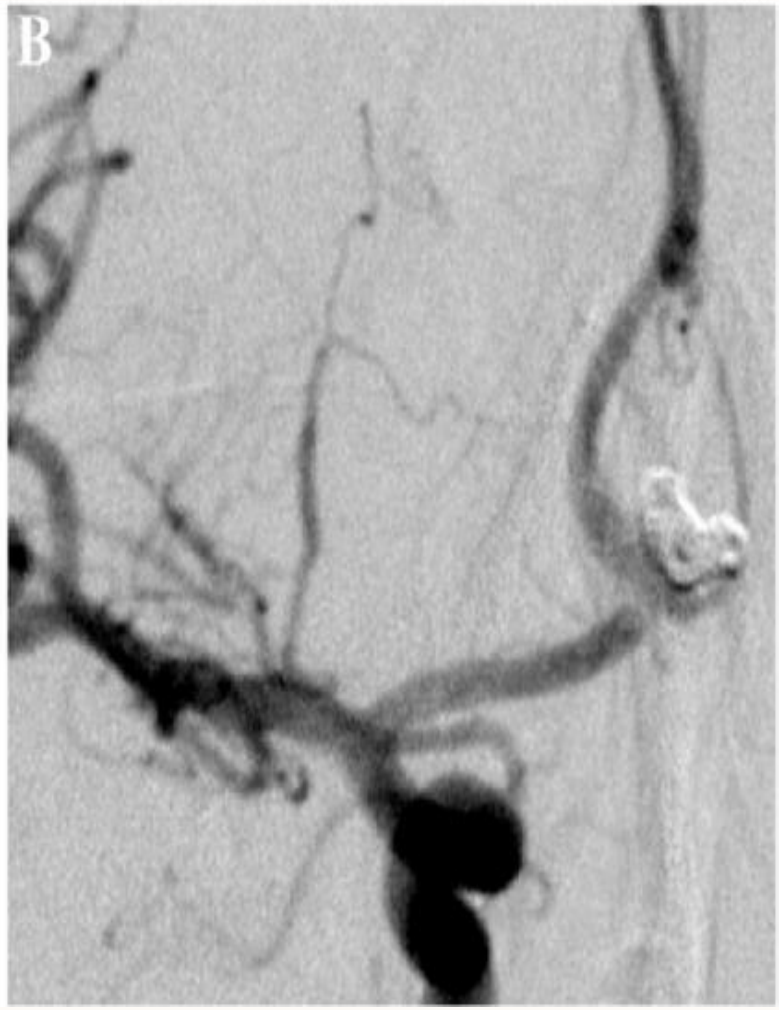
CASE STUDY

❖NCCT head scan which shows **hemorrhage within the anterior inter-hemispheric fissure** and **bilateral sylvian cisterns** more prominent on the **left.**

❖The patient then undergoes a **digital subtraction arteriography** (DSA) which showed **large aneurysm at ant: communicating artery**.

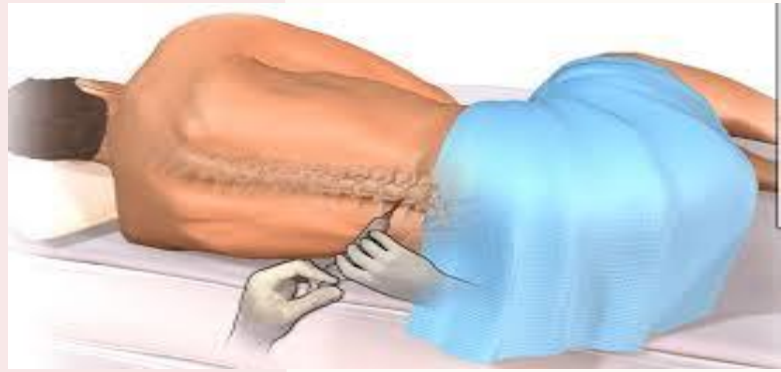
❖The patient was then referred to the department of **neurosurgery**.


A


B

❖The **initial imaging** modality should be a non-enhancing computerized tomography(**NC-CT**)not only **because** it is **easier** and more **cost-effective** to carry out.

❖ In an individual in whom SAH remains a potential diagnosis, a **normal imaging** study should be followed by a spinal tap **(LP).**



❖The opening cerebrospinal fluid pressure, its **color**, and appearance; the presence, type, and number of **cells**; and the biochemistry of the CSF and when indicated microbiology should be studied.

❖**CBC, ESR, hsCRP,** and standard biochemistry including thyroid functions is part of the routine ER workup.

LITERATURE REVIEW

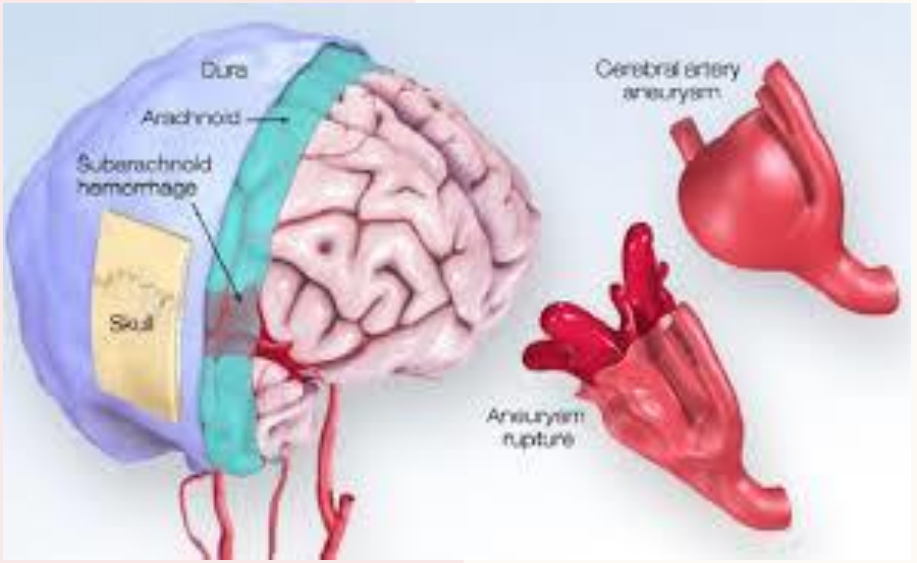
❖Approximately **85% of SAHs** are secondary to a **ruptured intracranial saccular aneurysm**

❖**10%** are caused by the **benign perimesencephalic syndrome** and

❖the **remainder** are caused by arteriovenous anomalies (**AVM**) and other rare conditions.

❖**Most SAH headache last days to weeks and initially nausea and vomiting occurs as well. Photophobia is also common.**

- **mortality** is **40-50%**
- **10-20%**of patients **dying before arriving at hospital**
- **50%of survivors** are left **disabled**



DIAGNOSTIC CRITERIA

IHS Classification ICHD-3

A. Any **new headache** fulfilling criteria C & D

B. SAH in the **absence of head trauma** has been diagnosed

C. Evidence of causation demonstrated by at least 2 of the following:

1. **Headache** has developed in **close temporal relation to** other symptoms and/or **clinical signs of SAH**, or has led to the diagnosis of SAH.

2. **Headache** has **significantly improved in parallel with stabilization** or improvement **of** other symptoms or **clinical or radiological signs of SAH**.

3. **Headache** has **sudden or thunderclap** onset

IHS Classification ICHD-3

D. Either of the following:

1. **Headache** has **resolved within 3 months**.

2. **Headache** has not yet resolved but **3 months have not yet passed**

E. **Not** better accounted for by **another ICHD-3 diagnosis**.

❖**The 3 months should be counted from stabilization, spontaneously or through treatment, rather than onset of the SAH.**

❖**Diagnosis of SAH is confirmed by non contrast enhanced CT scan**

Sensitivity of NCCT Head scan in SAH

1. **99%** in the **1st 6 hrs** after onset
2. 98% at 12 hrs
3. 93% at 24 hrs
4. 50% at 7 days

❖**When CT results are non-diagnostic or normal, LP is essential (sensitivity of LP near 99%).**

❖**Xenthochromia is present in all cases with aneurysmal SAH when CSF is collected between 6-12 hrs upto 2 weeks after the onset of symptoms**

❖**MRI is not indicated** as an **initial diagnostic** test for **SAH**

❖But **FLAIR** and **gradient echo T2 weighted images** may be **useful** when the **CT** scan is **normal** and **CSF is abnormal.**

❖In the presence of non traumatic **convexal SAH, older age**, sensorimotor dysfunction, stereotyped aura-like spells and absence of significant headache suggest **cerebral amyloid angiopathy** as the underlying cause.

❖**Younger age** and **recurrent thunderclap headache** predict **reversible cerebral vasoconstriction syndrome(RCVS).**

OTTAWA SUBARACHNOID HEMORRHAGE DECISION RULE

Inclusion criteria: alert, adult (>15 years old) patients with new, severe, non-traumatic headache reaching maximal intensity within one hour

Exclusion criteria: new neurologic deficits, prior history of aneurysm, subarachnoid hematoma, or brain tumor, or history of recurrent headaches (≥ 3 episodes in ≥ 6 months)

Age ≥ 40

Neck pain/stiffness

Witnessed loss of consciousness

Onset with exertion

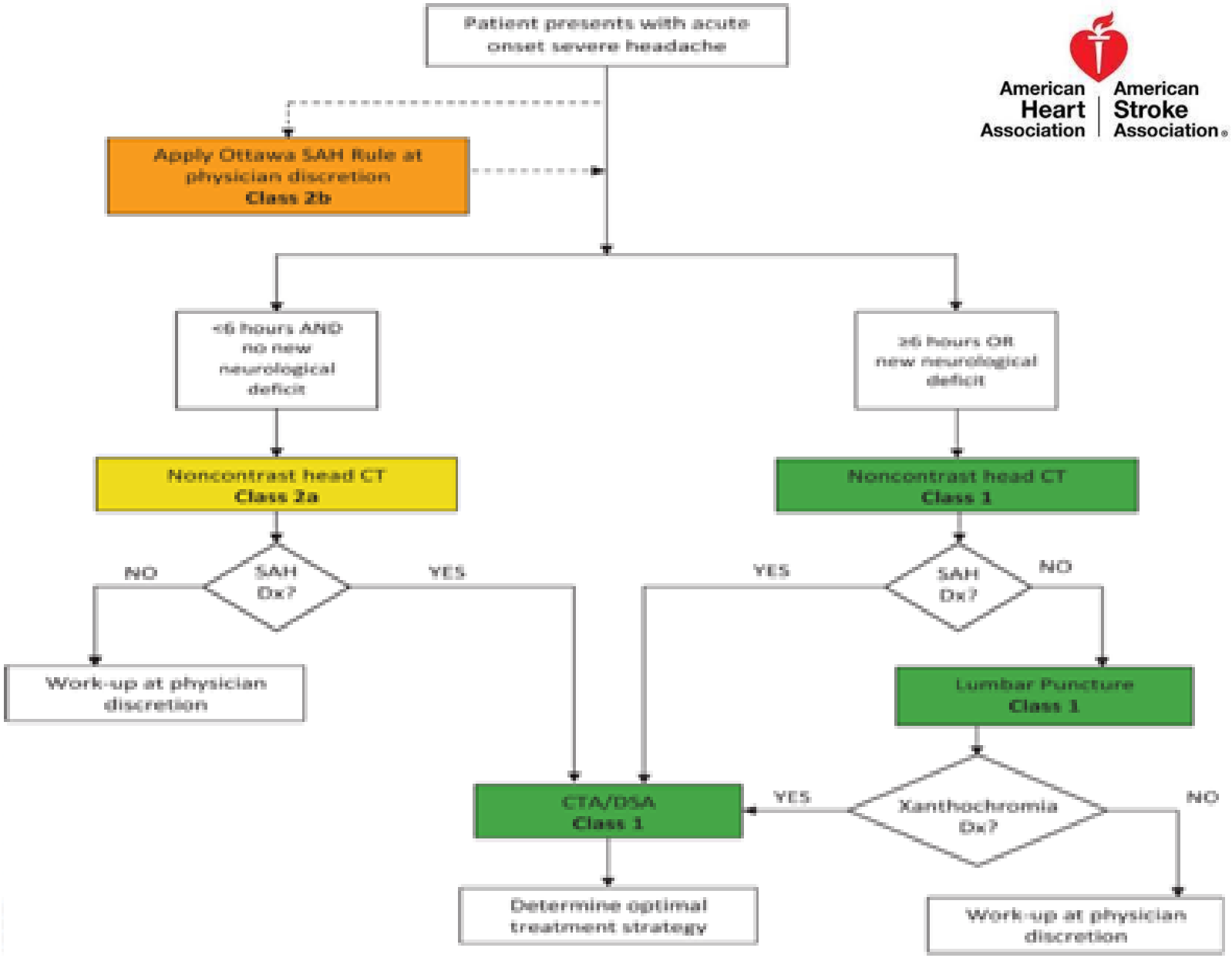
Instantly peaking/thunderclap headache

Limited neck flexion

100% sensitivity, specificity 15%

Perry JJ, Stiell IG, Sivilotti ML, et al. *JAMA.* 2013;310(12):1248–55.

ALGORITHM FOR SAH IN PATIENT WITH SUDDEN ONSET SEVERE HEADACHE



Brian L. Hoh. Stroke. 2023 Guideline for the Management of Patients With Aneurysmal Subarachnoid Hemorrhage: A Guideline From the American Heart Association/American Stroke Association, Volume: 54, Issue: 7, Pages: e314-e370, DOI: (10.1161/STR.0000000000000436)

DISCUSSION

❖ **Non-traumatic SAH** is one of the **most common cause of thunderclap headache**

- ❑ **abrupt onset is the key feature**
- ❑ **persistent,**
- ❑ **intense and incapacitating**

❖ is a **serious condition**

❖ **Acute headache attributed to non-traumatic SAH may** nonetheless **be moderate** and **without any associated signs**.

❖**Delayed diagnosis** often has a **catastrophic outcome**: **SAH is a neuro-interventional emergency.**

❖But, **initial misdiagnosis** occurs in one quarter to one half of (**25% to 50%**) patients, the most common specific misdiagnosis being **migraine**.

❖The most common **reasons for misdiagnosis** are

(1) **failure to obtain appropriate neuro-imaging**, or **misinterpretation** of it, or

(2) **failure to perform LP** in cases where this is required.

❖**After diagnosis of SAH(by NCCT and/or LP)**, the **next urgent step** is to **identify a ruptured aneurysm(by Angio)**

❖ **80% of cases of spontaneous SAH** result from **ruptured saccular aneurysms**

❖In patients who are **initially misdiagnosed** and in whom **SAH is belatedly recognized** when they present again a few days later, there is often **no aneurysm** and **no cause identifiable for SAH**.

❖In a large series of SAH, 34% of headaches occurred **during nonstrenuous activity** and 12% developed **during sleep**.

❖**Sudden-onset** HA is seen more often in patients with **benign causes** of **thunderclap** headaches.

❖**Nearly half** of patients with SAH have headaches that **deviate from the "classical" description.**

❖**No characteristic location** has been determined; neck pain is common, but **neck pain is also common in migraine.**

MEDICAL TREATMENT OF SAH

- To maintain **euvolemia** to improve functional outcome (**Class 2A, LOE B**)

- To **control BP** to prevent post-spasm ischemia **or Delayed Cerebral Ischemia**(DCI) and rebleeding. **Nimodipine** is recommended for post rupture spasm. (**Class 1, LOE A**)

- If **increase ICP or Cerebral Edema, IV Mannitol** is recommended (**Class 2A, LOE B-R**)

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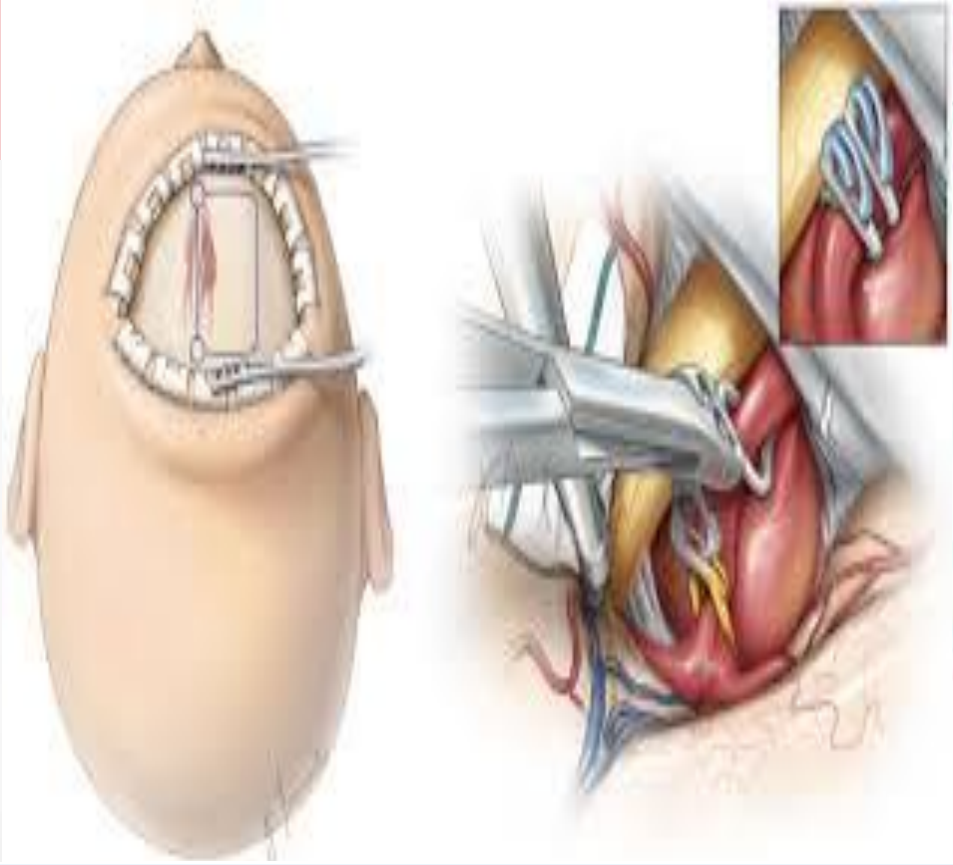
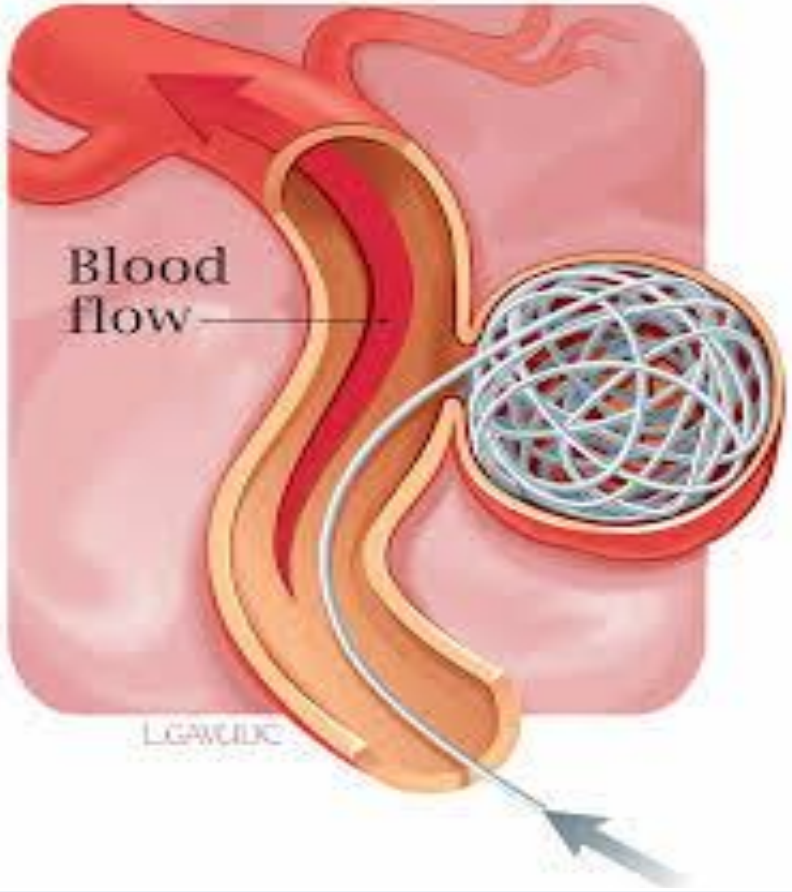
SURGICAL TREATMENT

❖Endovascular treatment with stent-assisted coiling or flow diverters

❖ Clipping



❖ Coiling



CONCLUSION

❖Despite advances in the diagnosis and treatment of aneurysmal subarachnoid hemorrhage, **mortality remains high.**

❖**The diagnosis is challenging** and has **devastating consequences if it is missed**.

❖Accurate **initial diagnosis and management are critical** to the outcome of the disease.

❖The emergency clinician must have **a high index of suspicion and a judicious approach** to evaluating the chief complaint of patients with **abrupt onset of severe headache** (TCH) → should be evaluated for SAH.

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Thank you