Headache & Facial Pain

Diagnosis and management

- The International Classification of Headache Disorders 3rd, edition beta version 2013- > 280 types of headache are described
- International Headache Society (http://www.ihs-headache.org/)
- „Cephalalgia” (http://cep.sagepub.com/ content/33/9/629. full).

HEADACHE:

- 1/ PRIMARY
- 2/ SECONDARY
- 3/ NEURALGIA

TENSION – TYPE HEADACHE

- Tension-type headache pain is often described as a **constant pressure**, as if the head were being squeezed in a vise. The pain is frequently present **on both sides** of the head at the same time. Tension-type headache pain is typically mild to moderate, but may be severe.
- Episodic or chronic
- Tension headaches affect about 1.4 billion people (20.8% of the population) and are more common in women than men (23% to 18% respectively)

Various precipitating factors may cause tension-type headache :

- Stress: usually occurs in the afternoon after long stressful work hours or after an exam
- Sleep deprivation
- Uncomfortable stressful position and/or bad posture
- Irregular meal time (hunger)
- Eyestrain
- Tension-type headaches may be caused by muscle tension around the head and neck. One of the theories says that the main cause for tension-type headaches is **teeth clenching which causes a chronic contraction of the temporalis muscle.**

Headache diagnosis:

1/ History talking: localisation of the pain, character, how long ?, how often ?, precipitating factors ; aura, character of aura, nusea, vomiting, if depends on body position, physical activity, weather, menstruation, sleep, history of headache in family , concomitant disease, concomitant treatment

2/ Physical examination, Neurological examination

3/ Laboratory (morphology, Fe, Borrelia burgdorferi)

4/ Neuroimaging: MR of the head, angio MR, angio CT

5/ ECG

6/ Ophthalmologist consultation

7/ Laryngologist consultation- sinusitis can be a cause of chronic headache

8/ Stomatologist consultaction

9/ Psychologist

10/In practice it is recommended to provide **patient's diary**

Treatment:

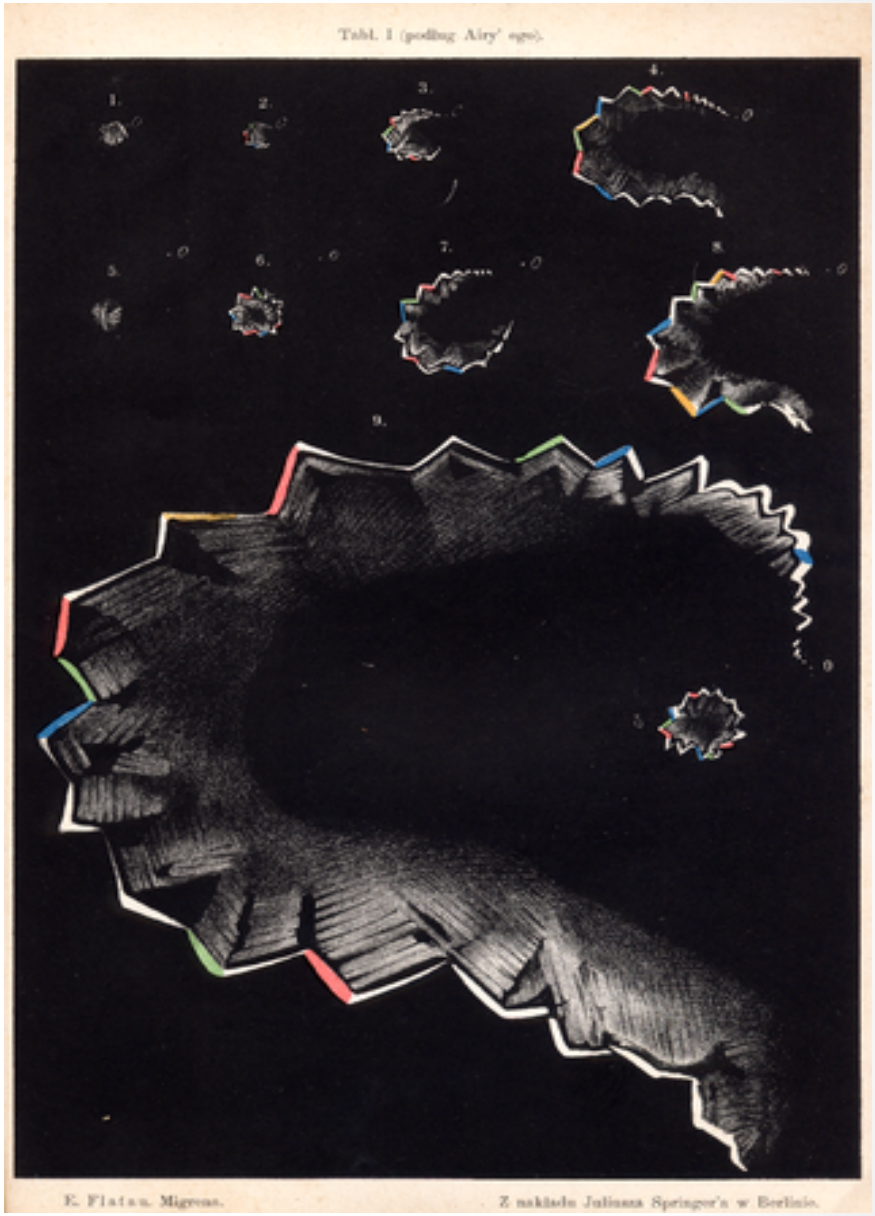
- prevention
- ibuprofen, paracetamol/ acetaminophen, aspirin
- relaxation techniques

MIGRAINE:

- Typically, the headaches affects one half of the head (but in children often bilateral) , are pulsating in nature, and lasts from two to 72 hours, can be moderate or severe
- Associated symptoms may include nausea, vomiting, and sensitivity to light, sound or smell
- The pain is generally made worse by physical activity.
- Up to one-third of people have an AURA: typically a short period of visual disturbance which signals that the headache will soon occur

MIGRAINE:

- **AURA**- mechanism of “cortical spreading depression”
- Aura appears gradually over a number of minutes and generally last less than 60 minutes.
- Symptoms can be visual, sensory or motor in nature and many people experience more than one.
- Visual effects occur most frequently: scintillating scotoma (an area of partial alteration in the field of vision which flickers and may interfere with a person's ability to read or drive)
- These typically start near the centre of vision and then spread out to the sides with zigzagging lines which have been described as looking like fortifications or walls of a castle. Usually the lines are in black and white but some people also see coloured lines. Some people loose part of their field of vision known as hemianopsia while others experience blurring.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„Alice in Wonderland Syndrom”

- Sensory aura: Often a feeling of pins-and-needles begins on one side in the hand and arm and spreads to the nose–mouth area on the same side
- Other symptoms of the aura phase can include speech or language disturbances, world spinning, and less commonly motor problems.
- Motor symptoms indicate that this is a hemiplegic migraine, and weakness hemiplegia, hemiparesis often lasts longer than one hour unlike other auras – 5 min- 24 hours- familial hemiplegic migraine – type 1 (FHM1-gen CACNA1A), type 2 (FHM2- gen ATP1A2), type 3 (FHM3- gen SCN1A)

- Migraines are believed to be due to a mixture of environmental and genetic factors. About two-thirds of cases run in families. Changing hormone levels may also play a role, as migraines affect slightly more boys than girls before puberty and two to three times more women than men.
- Mechanisms are not fully known – probably involve the nerves and blood vessels of the brain
- **Migraine** is believed to be a **neurovascular disorder** with evidence supporting its mechanisms starting within the brain and then spreading to the blood vessels. One theory is related to increased excitability of the cerebral cortex and abnormal control of pain neurons in the trigeminal nucleus of the brainstem. High levels of the neurotransmitter serotonin, also known as 5-hydroxytryptamine, are believed to be involved.

The diagnosis of migraine without aura, according to the International Headache Society, can be made according to the following criteria:

- Five or more attacks—for migraine *with* aura, two attacks are sufficient for diagnosis.
- Four hours to three days in duration
- Two or more of the following:
  - Unilateral (affecting half the head);
  - Pulsating;
  - Moderate or severe pain intensity;
  - Aggravation by or causing avoidance of routine physical activity
- One or more of the following:
  - Nausea and/or vomiting;
  - Sensitivity to both light (photophobia) and sound (phonophobia)

Migraines are divided into seven subclasses (some of which include further subdivisions):

- Migraine without aura, or "common migraine", involves migraine headaches that are not accompanied by an aura.
- Migraine with aura, or "classic migraine", usually involves migraine headaches accompanied by an aura
- Childhood periodic syndromes that are commonly precursors of migraine include cyclical vomiting (occasional intense periods of vomiting), abdominal migraine (abdominal pain, usually accompanied by nausea), and benign paroxysmal vertigo of childhood (occasional attacks of vertigo).

- Retinal migraine involves migraine headaches accompanied by visual disturbances or even temporary blindness in one eye.
- Complications of migraine describe migraine headaches and/or auras that are unusually long or unusually frequent, or associated with a seizure or brain lesion.
- Probable migraine describes conditions that have some characteristics of migraines, but where there is not enough evidence to diagnose it as a migraine with certainty (in the presence of concurrent medication overuse).
- Chronic migraine is a complication of migraines, and is a headache that fulfills diagnostic criteria for *migraine headache* and occurs for a greater time interval. Specifically, greater or equal to 15 days/month for longer than 3 months.

MIGRAINE- MANAGEMENT

1. Management of the attack :

- - Analgesic: Paracetamol , Ibuprofen, Aspirin, Naproxen,
- - Triptans
- - Metoclopramid
- - Ergotamine
- Status migrainosus (when migraine lasting longer than 72 hours) - Metoclopramid, Diazepam, Mannitol, steroids

2. Preventive treatment :

- Propranolol, Flunaryzyna, amitryptylina, antiepileptic drugs (VPA, topiramat, gabapentyna)
- Non pharmacological methods - use of stress reduction techniques such as cognitive behavioural therapy and relaxation techniques
- elimination of triggers, dietary

SECONDARY HEADACHE

- Trauma capitis, vascular diseases, hypertension, infection, epilepsy, increased intracranial pressure (tumour cerebri, idiopathic intracranial hypertension=pseudotumour cerebri), laryngological disease (sinusitis, otitis), ophatmologic disease (vision loss, glaucoma)
- Headache in stomatology: odontogenic pain, non-odontogenic pain, temporomandibular joint dysfunction syndrome
- Headache in tumour cerebri: Due to increase of intracranial pressure, bilateral, often in the morning with vomiting - neuroimaging cito !!!

- *Bruns' syndrome*: Characterized by sudden and severe headache, accompanied by vomiting and vertigo, triggered by abrupt movement of the head. Principal causes are cysts and cysticerosis of the fourth ventricle, and tumours of the midline of the cerebellum and third ventricle

Trigeminal neuralgia= tic douloureux

- episodes of intense facial pain along the trigeminal nerve divisions. The trigeminal nerve is a paired cranial nerve that has three major branches: the ophthalmic nerve (V_1), the maxillary nerve (V_2), and the mandibular nerve (V_3).

  Trigeminal neuralgia most commonly involves V2 or V3.
- Each individual attack usually lasts from a few seconds to several minutes or hours, but these can repeat for hours with very short intervals between each attack. In other instances only 4-10 attacks are experienced daily. The episodes of intense pain may occur paroxysmally.

Trigeminal neuralgia

- To describe the pain sensation, patients often describe a trigger area on the face so sensitive that touching or even air currents can trigger an episode; however, in many patients the pain is generated spontaneously without any apparent stimulation. It affects lifestyle as it can be triggered by common activities such as eating, talking, shaving and brushing teeth. Wind, chewing and talking can aggravate the condition in many patients.
- The attacks are said by those affected to feel like stabbing electric shock, burning, sharp, pressing, crushing, exploding or shooting pain that becomes intractable.

Trigeminal neuralgia

- Several theories exist to explain the possible causes of neuralgia.
- leading research indicates that it is an enlarged or lengthened blood vessel – most commonly the superior cerebellar artery – compressing or throbbing against the microvasculature of the trigeminal nerve near its connection with the pons. Such a compression can injure the nerve's protective myelin sheath and cause erratic and hyperactive functioning of the nerve. This can lead to pain attacks at the slightest stimulation of any area served by the nerve as well as hinder the nerve's ability to shut off the pain signals after the stimulation ends.
- This type of injury may rarely be caused by an aneurysm ; by an AVM (arteriovenous malformation); by a tumour in the cerebellopontine angle.
- Other causes: multiple sclerosis, Herpes simplex (V1)

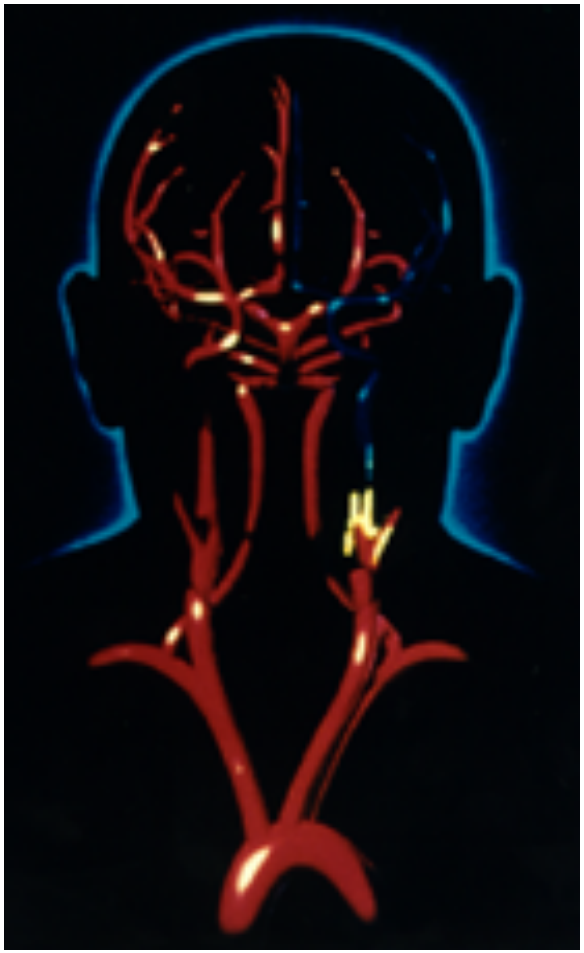
Trigeminal neuralgia

- Diagnosis: MR , angio MR
- MANAGEMENT:
- carbamazepin, gabapentin, okskarbazepine, pregabalin, valproic acid, lamotrigine, phenytoin, clonazepam
- Surgical – non-destructive method- microvascular decompression or destructive methods

Glossopharyngeal neuralgia (GN)

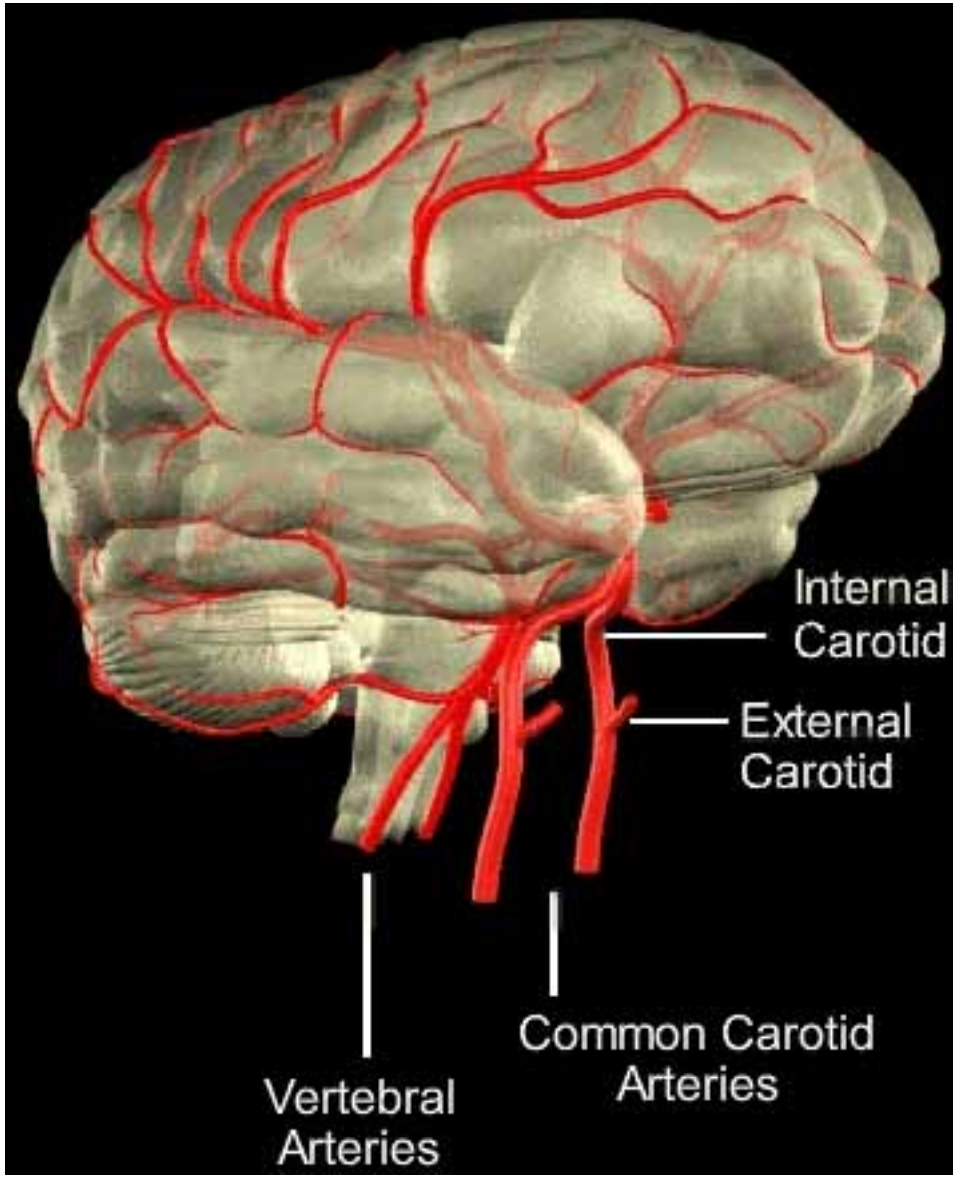
- Affects the glossopharyngeal nerve and causes sharp, stabbing pulses of pain in the back of the throat and tongue, the tonsils, and the middle ear.
- Pain can last for a few seconds to a few minutes, and may return multiple times in a day or once every few weeks.
- Many individuals with GN relate the attacks of pain to specific trigger factors such as swallowing, drinking cold liquids, sneezing, coughing, talking, clearing the throat, and touching the gums or inside the mouth.
- GN can be caused by compression of the glossopharyngeal nerve, but in some cases, no cause is evident. It can be associated with multiple sclerosis. GN primarily affects the elderly.

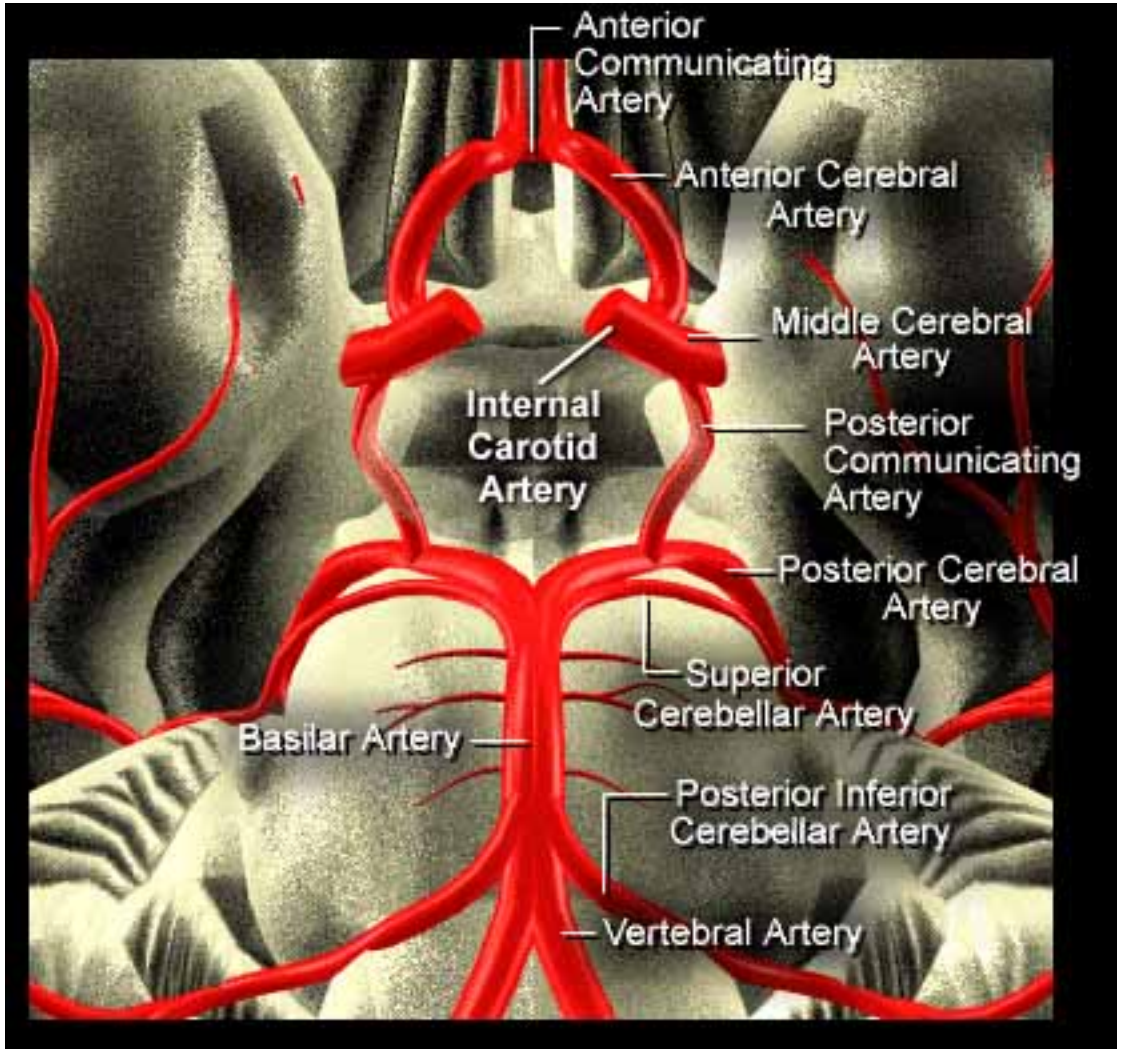
STROKE

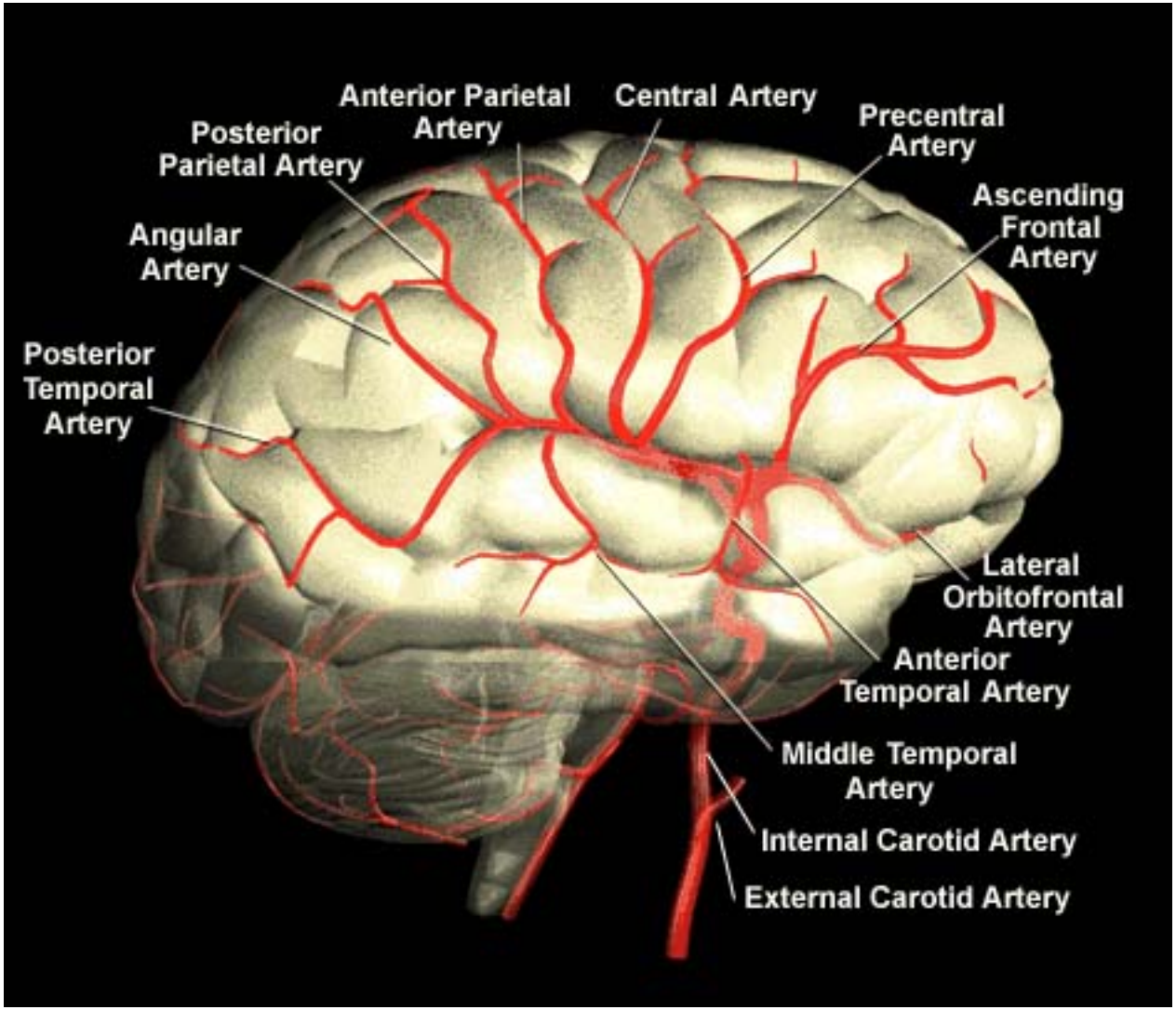


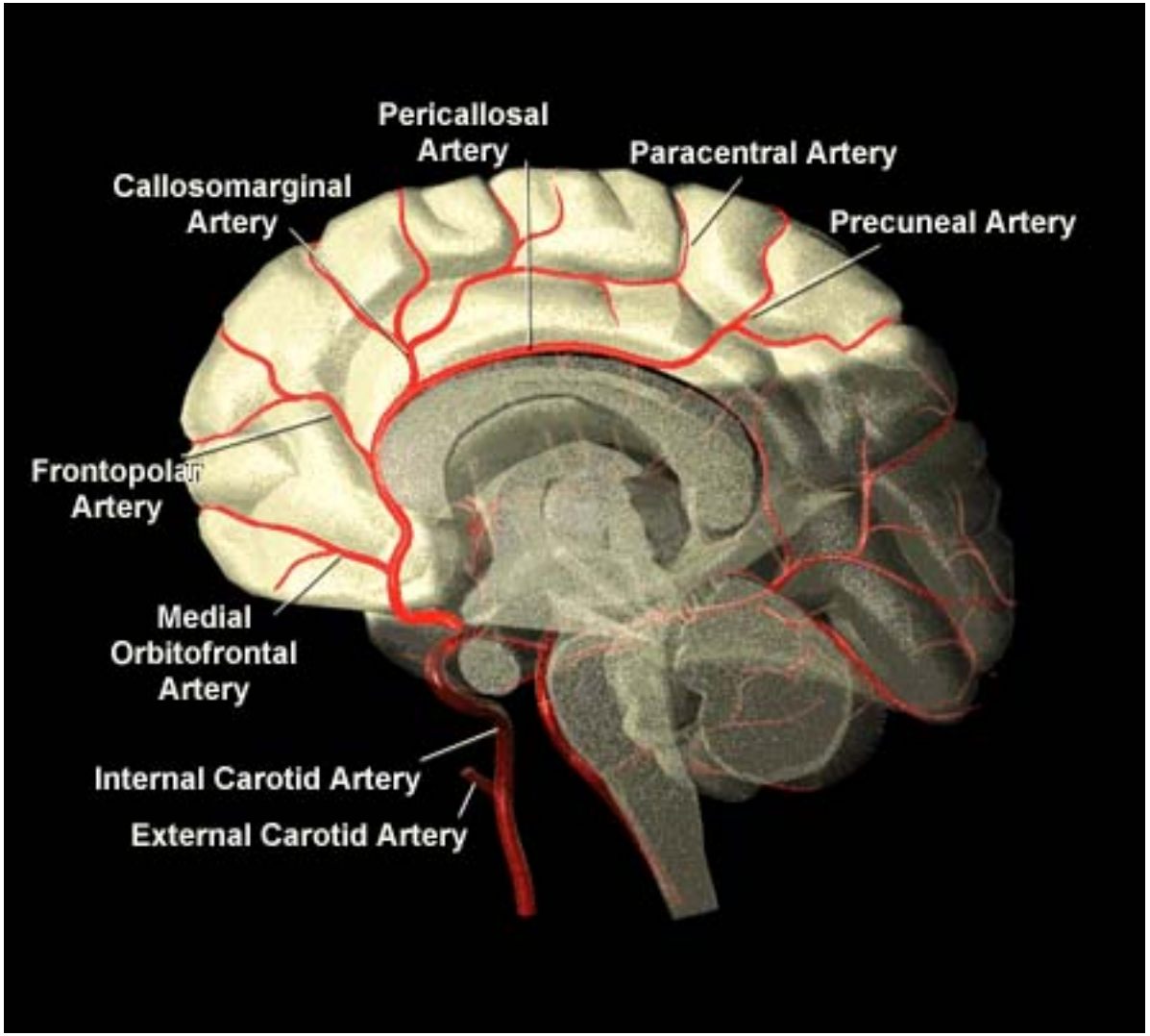
DEFINITION OF STROKE

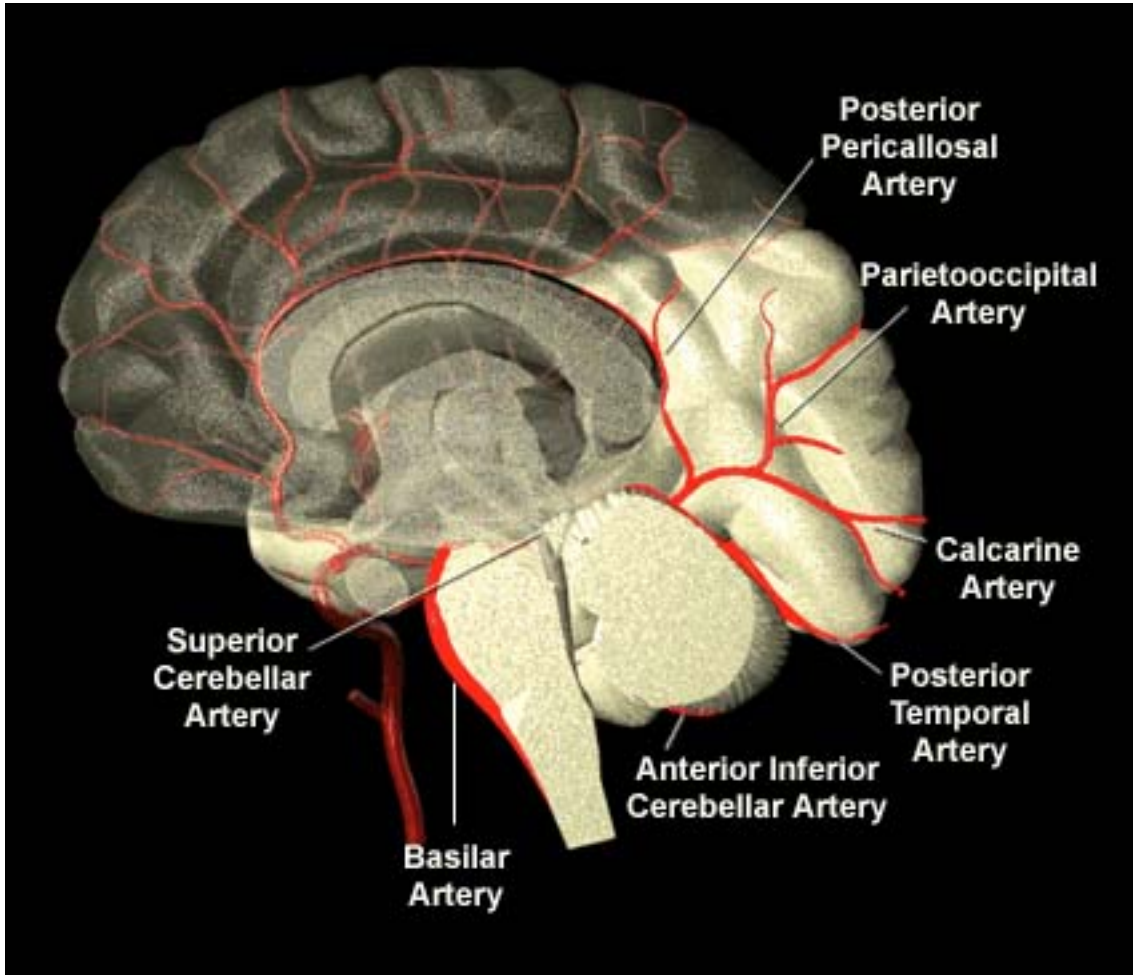
- Stroke, also known as cerebrovascular accident (CVA) or "brain attack", is a syndrome caused by a disruption in the flow of blood to part of the brain due to either occlusion of a blood vessel (ischemic stroke) or rupture of a blood vessel (hemorrhagic stroke). The interruption in blood flow deprives the brain of nutrients and oxygen, resulting in injury to cells in the affected vascular territory of the brain. Ischemic strokes are more common than hemorrhagic strokes.
- When brain cells die, function of the body parts they control is impaired or lost, causing paralysis, speech and sensory problems, memory and reasoning deficits, coma, and possibly death


Internal Carotid
External Carotid
Common Carotid Arteries
Vertebral Arteries


Anterior Communicating Artery
Anterior Cerebral Artery
Middle Cerebral Artery
Internal Carotid Artery
Posterior Communicating Artery
Posterior Cerebral Artery
Superior Cerebellar Artery
Basilar Artery
Posterior Inferior Cerebellar Artery
Vertebral Artery


Anterior Parietal Artery
Central Artery
Posterior Parietal Artery
Precentral Artery
Ascending Frontal Artery
Angular Artery
Posterior Temporal Artery
Lateral Orbitofrontal Artery
Anterior Temporal Artery
Middle Temporal Artery
Internal Carotid Artery
External Carotid Artery


Pericallosal Artery
Paracentral Artery
Callosomarginal Artery
Precuneal Artery
Frontopolar Artery
Medial Orbitofrontal Artery
Internal Carotid Artery
External Carotid Artery


Posterior
Pericallosal
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Calcarine
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Temporal
Artery
Anterior Inferior
Cerebellar Artery
Basilar
Artery

TYPES OF STROKE

- Ischemic stroke

  (IS) 75 - 85%
- Intracerebral hemorrhage

  (ICH) 10 - 20%
- Subarachnoidal hemorrhage (SAH)

  ok. 5%

BRAIN ISCHEMIA

- Transient ischemic attack, TIA
  (<24 hours)
- Reversible ischemic neurological deficit, RIND
  (<21 days)

- Minor stroke (non-disabling)
- Major stroke (disabling)

FACTORS ASSOCIATED WITH AN INCREASED RISK OF STROKE

- Age (increased with age)
- Gender (males > females)
- Race (Blacks > Asians and Hispanics > Whites)
- Geographic region (Eastern Europe > Western Europe; Asia > Europe or North America)
- Family history (stroke or heart disease < age 60)

POTENTIALLY MODIFABLE RISK FACTORS FOR STROKE

- Hypertension
- Diabetes mellitus
- Hyperlipidemia
- Smoking
- Atrial fibrillation
- Hyperhomocysteinemia
- Physical activity

OTHER POTENTIAL RISK FACTORS

- Migraine
- Oral contraceptives
- Obesity
- Pregnancy
- Alcohol abuse
- Drug abuse
- Sleep disorders (sleep apnea)

TYPES OF IS

- **ATHEROSCLEROTIC (**Plaques lead to stenosis, occlusion, distal embolisation (artery-to-artery embolism) and steal phenomena
- **CARDIOEMBOLIC**
- **LACUNAR**
- **OTHERS**
- **UNDETERMINED**

CARDIAC CAUSES OF IS

- Atrial fibrillation
- Recent MI
- Ventricular aneurysm (post MI)
- Akinetic segment (post MI)
- Dilated cardiomyopathy
- Mural or intraventicular thrombus
- Valvular abnormalities (mitral insufficiency, mitral and aortal stenosis). Also congenital
- Infective endocarditis
- Atrial septal aneurysm / defect
- Patent foramen ovale (PFO)
- Myxoma
- Mechanical or bioprosthetic valve
- CABG, PTCA, other cardiac surgery

OTHER CAUSES OF IS

- **Vasculopathies**
  - **Noninflamatory (dissection, vasospasm, others)**
  - **Inflamatory (PAN, SLE, vasculitis, others)**
  - **Infectious (syphilis, Herpes Zoster, AIDS, others)**

OTHER CAUSES OF IS

- **Hematologic and coagulation disorders**
  - **Polycythemia, thrombocytosis, trombocytopenia**
  - **Antithrombin III deficiency**
  - **Protein C or S deficiency**
  - **Deficiency of factors V, VII, XII, XIII**
  - **Antiphospholipid/anticardiolipin antibodies**
  - **Malignancy**
  - **Pregnancy**
  - **Oral contraceptives**

SYMPTOMS OF STROKE

- Symptoms depend on localization and size of lesion
- Less on etiology / cause of stroke
- Focal symptoms
- Global symptoms

SYMPTOMS OF STROKE

Time course and evolution:

- **Sudden or rapid onset of symptoms**
  - **in the morning, in daytime**
  - **on sleep, exercise**
- **Reach maximal intensity within 24 hours**
- **Gradual or stepwise worsening can occur**

SYMPTOMS OF STROKE

Focal neurological symptoms:

- **Cognitive impairments (aphasia, neglect, apraxia)**
- **Weakness or incoordination of limbs**
- **Facial weakness**
- **Numbness of limbs and/or face**
- **Cranial nerve palsies**

SYMPTOMS OF STROKE

Global symptoms and signs:

- **Headache**
- **Nausea and vomiting**
- **Altered mental status**
  - **syncope**
  - **seizure**
  - **coma**
- **Hypertension and abnormal vital signs**
- **Nuchal rigidity**

SYMPTOMS OF TIA / STROKE

- **Carotid circulation**
  - **Ipsilateral monocular blindness**
  - **Contralateral weakness, numbness (hand, arm, face, leg)**
  - **Aphasia**

Left hemisphere (ie, dominant)

- Right hemiparesis, variable involvement of face and upper and lower extremity
- Right-sided sensory loss, in a similar pattern to the motor deficit; usually involves all modalities, decreased stereognosis, graphesthesia
- Right homonymous hemianopia
- Aphasia, fluent and nonfluent
- Alexia
- Agraphia
- Acalculia
- Apraxia

Right hemisphere (ie, nondominant)

- Left hemiparesis (same pattern as on right)
- Left-sided sensory loss (similar pattern as the motor deficit)
- Left homonymous hemianopia (same pattern as on right)
- Neglect of the left side of environment
- Anosognosia
- Asomatognosia
- Loss of prosody of speech
- Flat affect

Posterior circulation

PCA occlusion

- **The most common finding is occipital lobe infarction leading to contralateral hemianopia with macular sparing**

- **Clinical symptoms associated with occlusion of the PCA vary depending on the location of the occlusion and may include the thalamic syndrome, thalamic perforate syndrome, Weber syndrome, cortical blindness, color blindness, failure to see to-and-fro movements, verbal dyslexia, and hallucinations.**

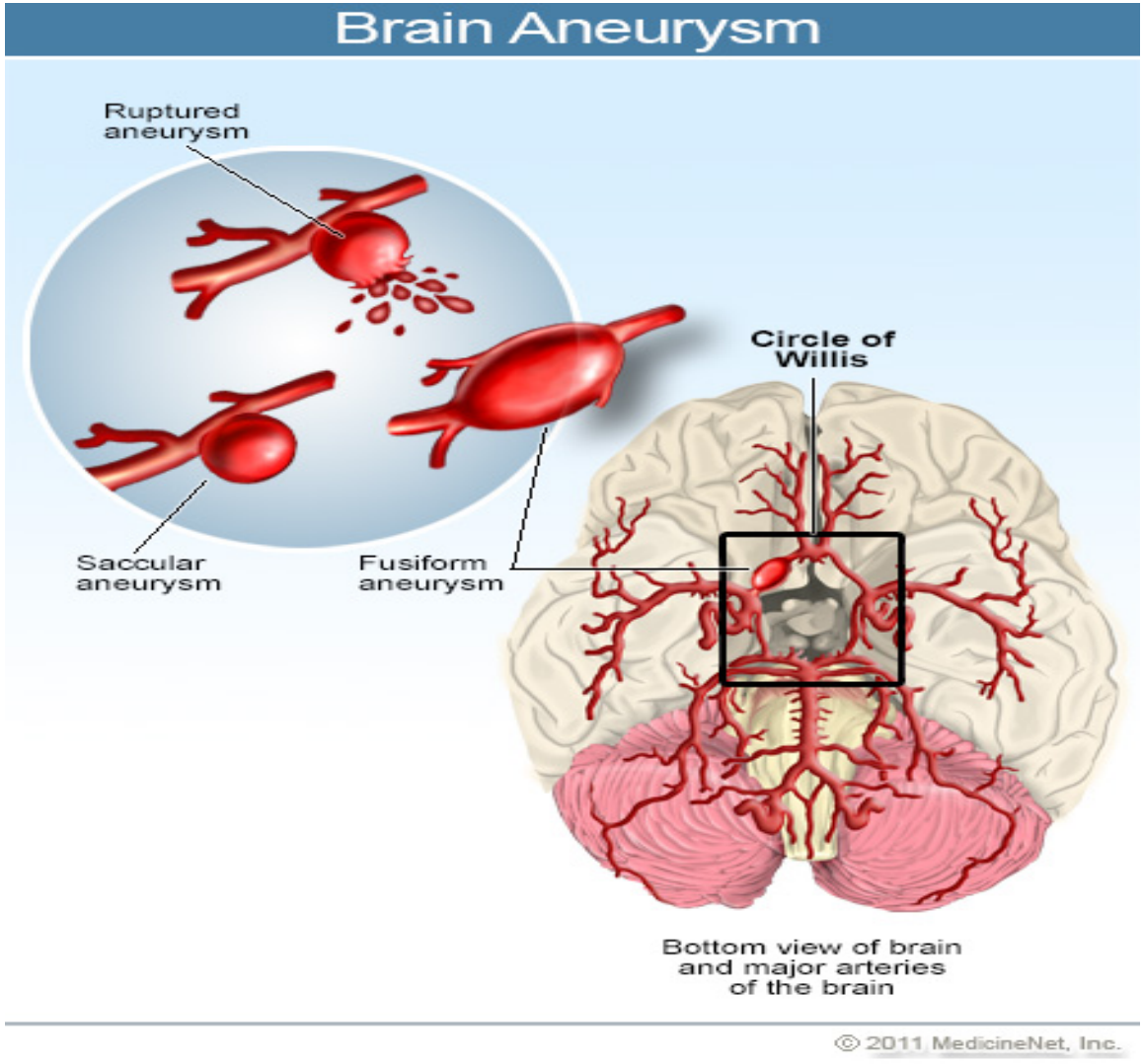
Basilar artery oclusion

- Abnormal level of consciousness
- Quadriparesis, which usually is asymmetric
- Pupillary abnormalities
- Oculomotor signs

Subarachnoid haemorrhage (SAH)

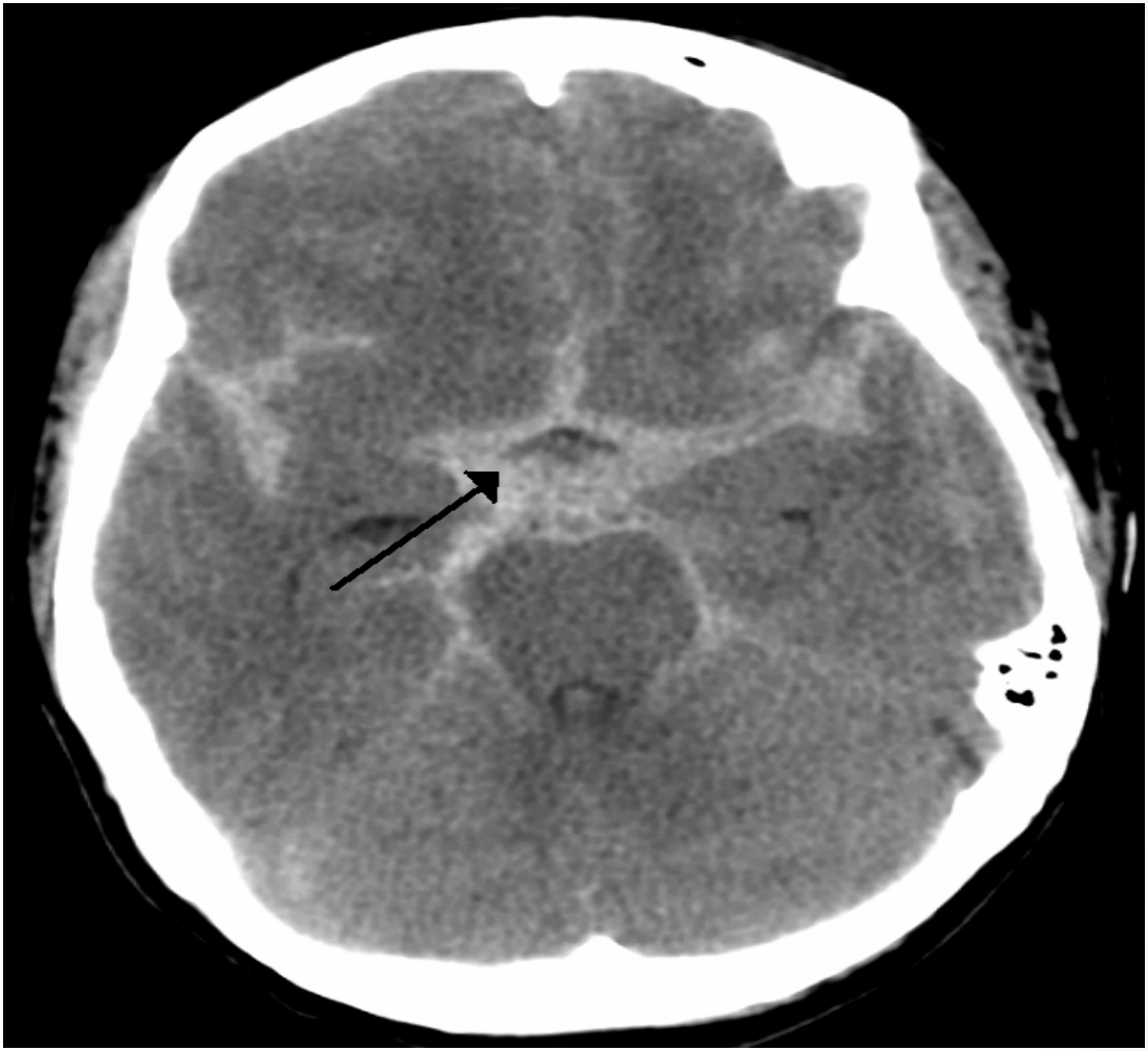
- Bleeding into the subarachnoid space —the area between the arachnoid membrane and the pia mater surrounding the brain.
- This may occur spontaneously, usually from a ruptured cerebral aneurysm, or may result from head injury

Cerebral aneurysm—a weakness in the wall of one of the arteries in the brain that becomes enlarged. They tend to be located in the circle of Willis and its branches.



Subarachnoid haemorrhage (SAH)

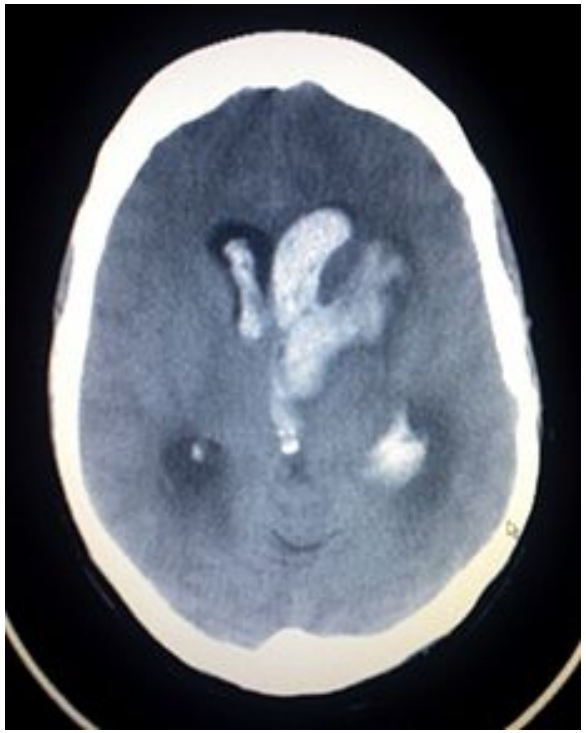
- Signs and symptoms : a severe headache with a rapid onset ("thunderclap headache"), a headache described as "like being kicked in the head", or the "worst ever", developing over seconds to minutes. This headache often pulsates towards the occiput (the back of the head) , meningism, vomiting, confusion or a lowered level of consciousness, and sometimes seizures
- Diagnosis: CT of the head, MR, lumbar puncture - mandatory in people with suspected SAH if imaging is negative (red blood cells, xanthochromia at least >12 hours after the headache), ECG, angiography



Subarachnoid haemorrhage (SAH)Management :

- involves general measures to stabilize the patient while also using specific investigations and treatments.
- prevention of rebleeding by obliterating the bleeding source (neurosurgery) , prevention of a phenomenon known as vasospasm (nimodipine- calcium channel blocker),
- and prevention and treatment of complications (seizures- antiepileptic drugs, electrolyte disturbances like hyponatremia, hydrocephalus)

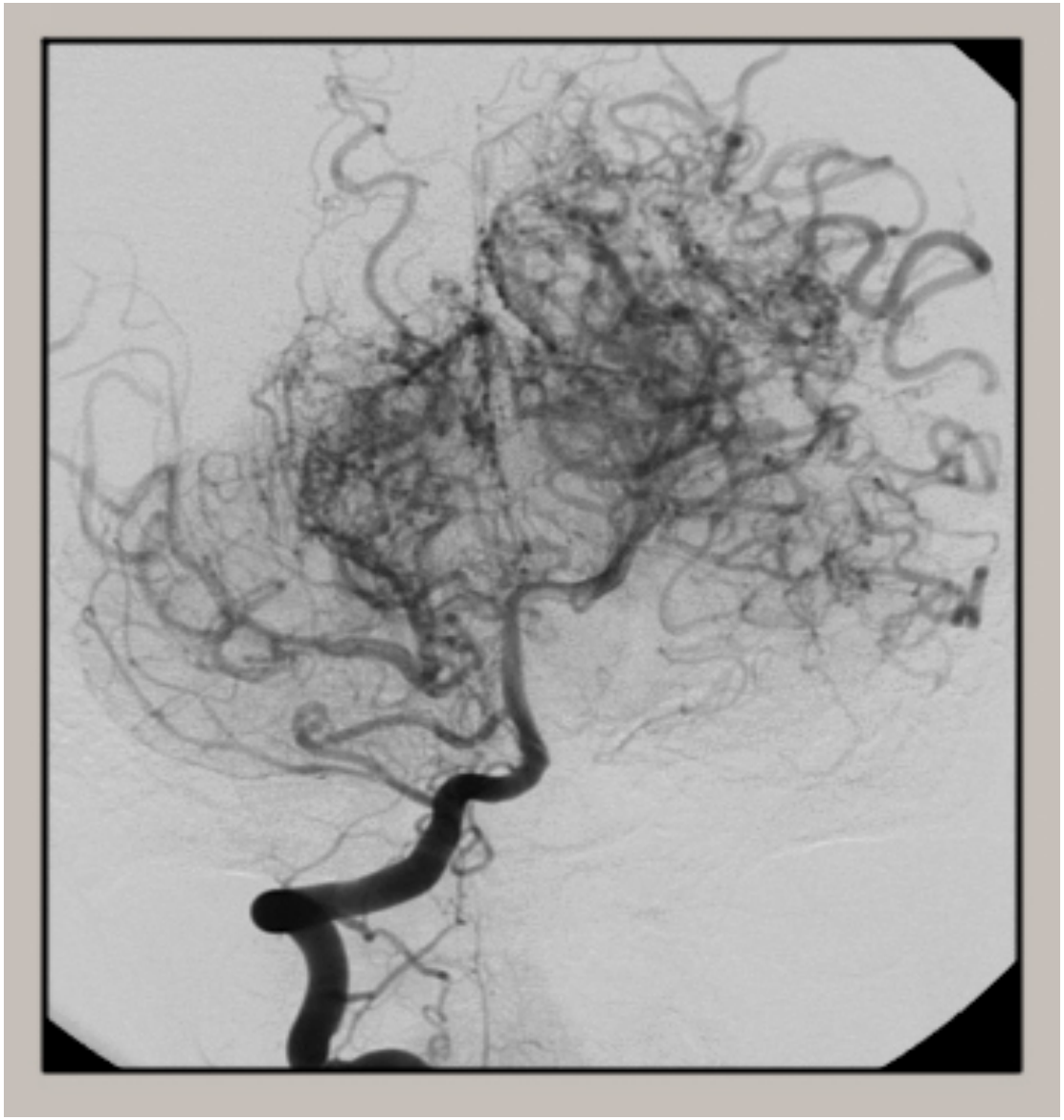
CEREBRAL HAEMORRHAGE:



- spontaneous intracerebral hemorrhage (in pt with hypertension)
- head trauma
- rupture of an aneurysm or arteriovenous malformation (AVM)
- bleeding within a tumor
- amyloid angiopathy
- Risk factors for ICH include:
- hypertension (high blood pressure)
- Diabetes mellitus
- Cigarette smoking
- Excessive alcohol consumption
- Severe migraine

Moyamoya syndrome :

- is a disease (congenital or acquired) in which certain arteries in the brain are constricted. A collater circulation develops around the blocked vessels to compensate for the blockage, but the collateral vessels are small, weak, and prone to hemorrhage, aneurysm and thrombosis. On conventional X-ray angiography, these collateral vessels have the appearance of a "puff of smoke" (described as "もやもや (moyamoya)" in Japanese).
- Moyamoya disease tends to affect adults in the third to fourth decade of life. In children it tends to cause strokes or seizures. In adults it tends to cause strokes or bleeding. The clinical features are strokes, recurrent transient ischemic attacks (TIAs), sensorimotor paralysis (numbness and paralysis of the extremities), convulsions and/or migraine-like headache.
- Treatment: aspirin, surgical



Thank You