

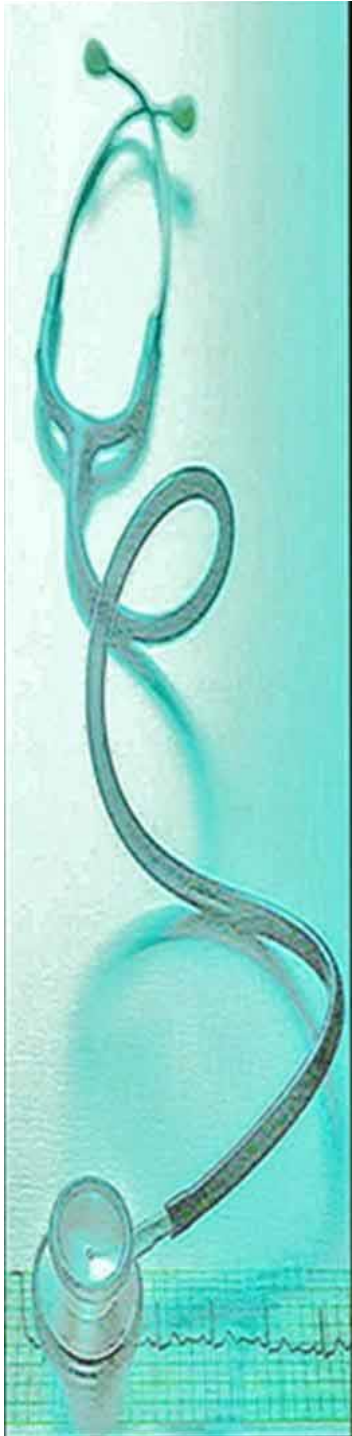


HEADACHES
OF
NEUROSURGICAL IMPORTANCE

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F.C.S

Consultant Neurosurgeon



“Headache is a banal symptom with many causes, organic and otherwise. It is probably the commonest symptom about which patients consult the doctors, or for which they are referred to neurological clinics”

HEADACHE FEATURES

- 90 % of the population
- Tension type/ Migraine
- Self medication- 80 %
- 20 % seek medical attention
- Medication overuse headache(IHS)

CLASSIFICATION

- PRIMARY HEADACHE DISORDERS

- Migraine
- Tension type headache
- Cluster headache
- Other primary headache

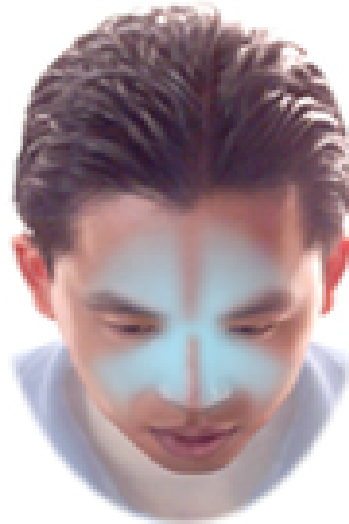
SECONDARY HEADACHE

- Head/and neck trauma
- Cranial or cervical vascular disorders (SAH, GC arteritis)
- Non vascular intracranial disorder (Hydrocephalus, neoplasm)

Types and Causes

Headaches

Sinus:
pain is
behind
browbone
and/or
cheekbones



Cluster:
pain is
in and
around
one eye

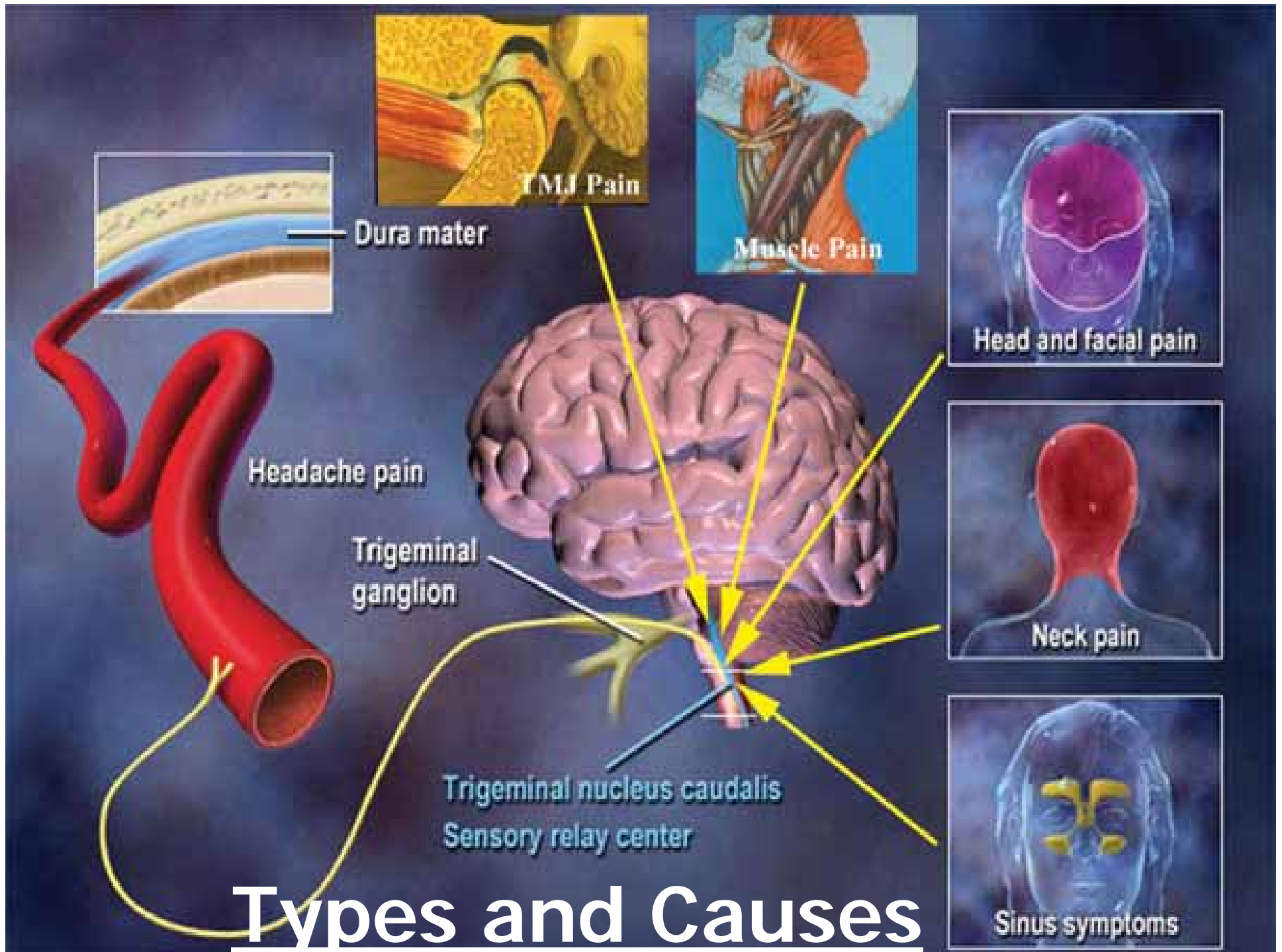


Tension:
pain is
like a band
squeezing
the head



Migraine:
pain, nausea
and visual
changes are
typical of
classic form

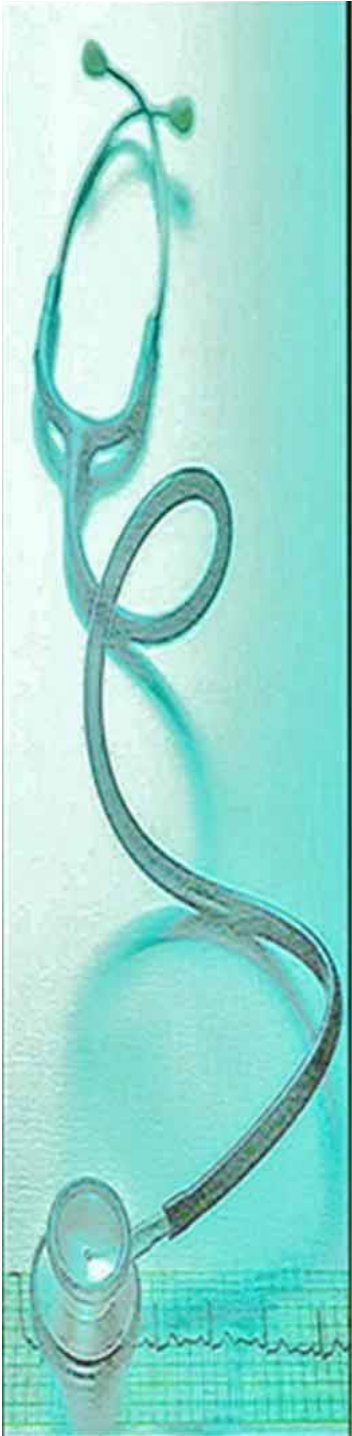




RAISED INTRACRANIAL PRESSURE (ICP)

Common Causes of Intracranial Pressure

- Cerebral Tumors
- Intracranial Hemorrhages (AVM, Aneurysm)
- Intracranial Sepsis, Abscess
- Hydrocephalus
- Benign Intracranial Hypertension



A vertical graphic on the left side of the slide. It features a stethoscope with a silver chest piece and a black tube, set against a light blue background. Below the stethoscope, there is a white ECG (heart rate) line on a grid. The entire graphic is framed by a thin black border.

Major Features of Raised ICP

- Headache
- Vomiting
- Papilloedema
- Drowsiness
- Mental Change

Clinical Features

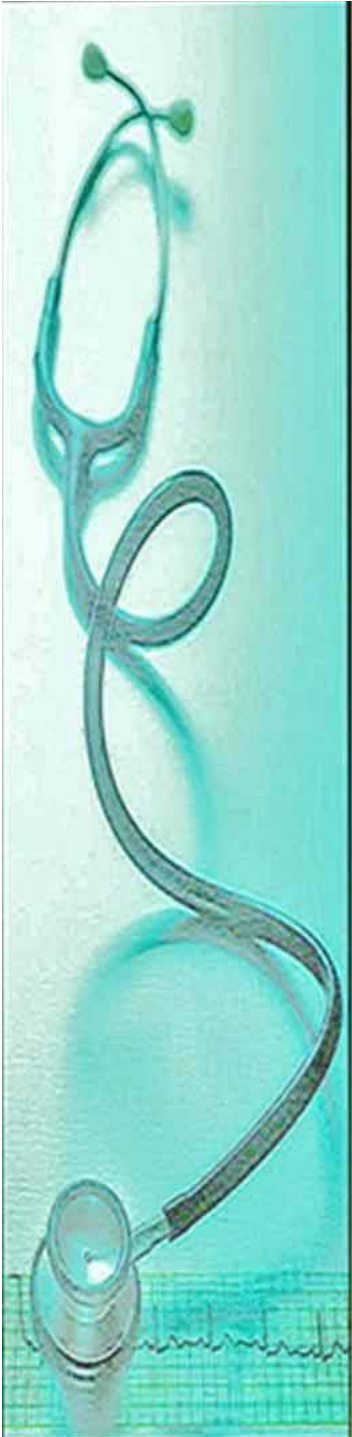
Headache

- Awaken the patient at an early hour
- Frontal, bitemporal and bilateral
- Throbbing in nature
- Increased by exertion, coughing, sneezing, stooping, straining at stool
- Often worse when patient is lying and partly relieved when patient is upright
- Progressive

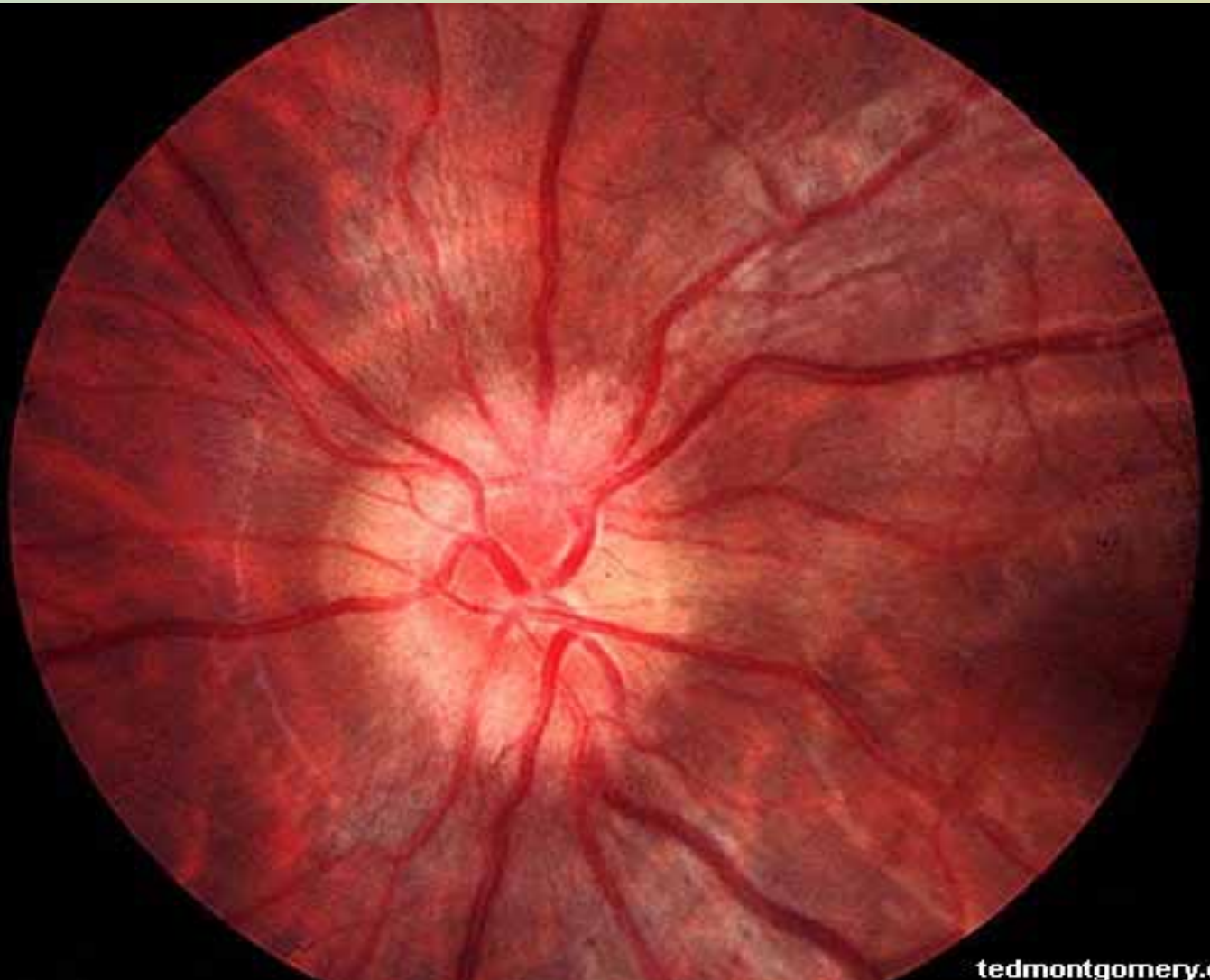


Vomiting

- Night or early morning
- Sudden, violent without preliminary nausea

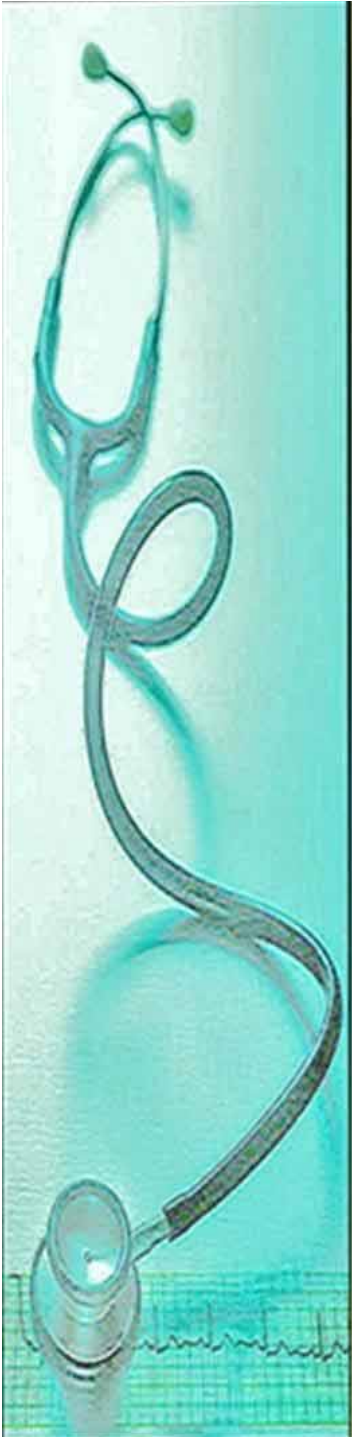


Papilloedema



Papilloedema

- The presence of Papilloedema confirms raised ICP, absence does not exclude it
- Absence in one third of patients with significant raised ICP
- Lumbar Puncture – unsafe
- Blurring of vision
- Diplopia (Abducens Nerve Paresis)



Drowsiness and Mental Changes

Drowsiness is a very important clinical feature of raised ICP and may precede rapid neurological deterioration.



MENTAL CHANGES WITH RAISED ICP

- Intellectual deterioration
- Apathy, personal neglect, incontinence
- Mainly frontal lobe tumours or in the Corpus Callosum
- More often in the elderly than younger patient

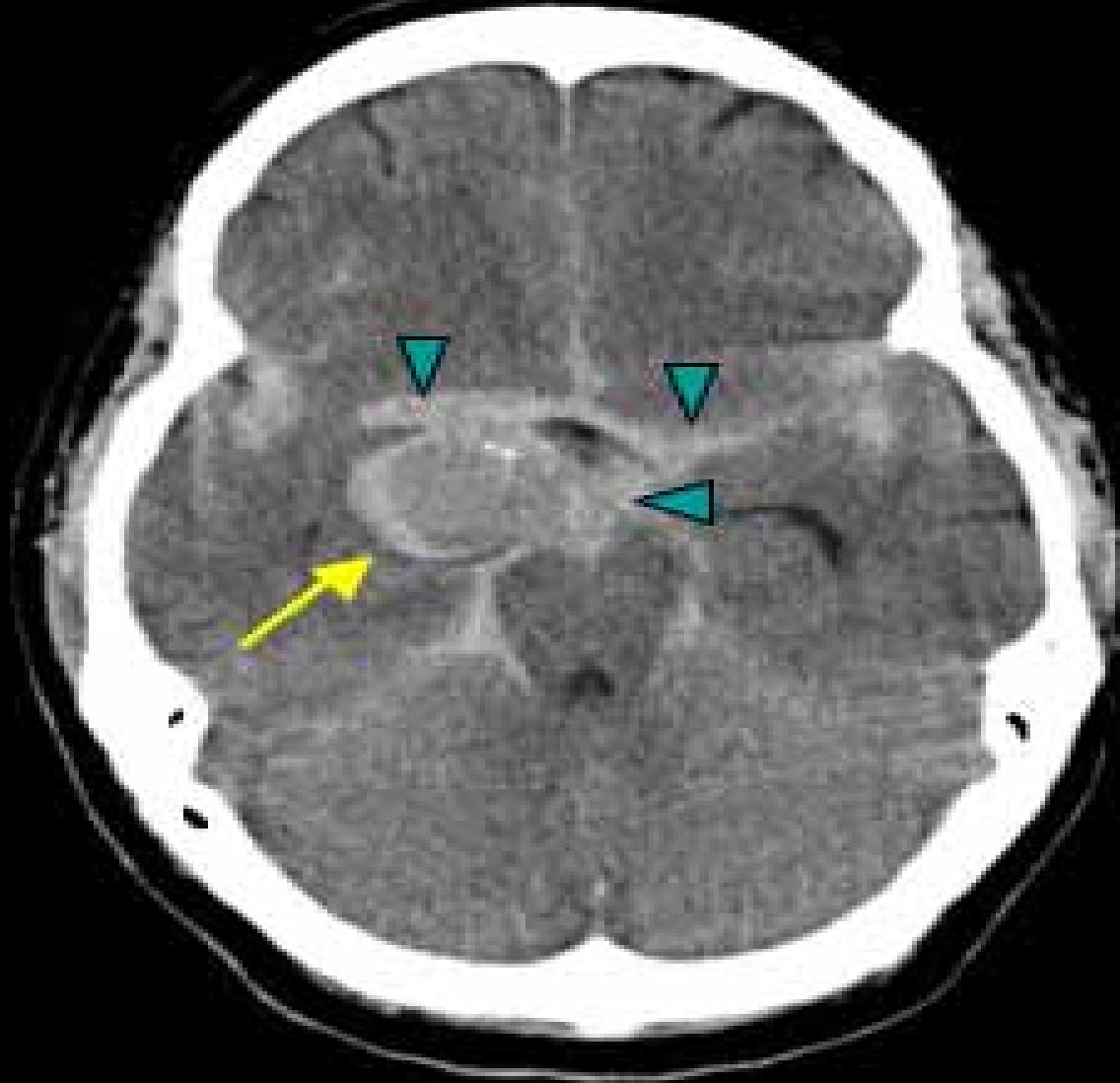




NEUROSURGICAL CAUSES OF HEADACHE

- Intracranial haemorrhage (ICH, SAH)
- Neoplasm (brain tumour)
- Chronic subdural haematoma
- Anterior ethmoidal syndrome
- Hydrocephalus
- Pituitary apoplexy
- Chiari malformation
- Headache of extracranial origin (cervicogenic)
- Headache due to traumatic brain injury (TBI) and intracranial sepsis

Sub Arachnoid Hemorrhage

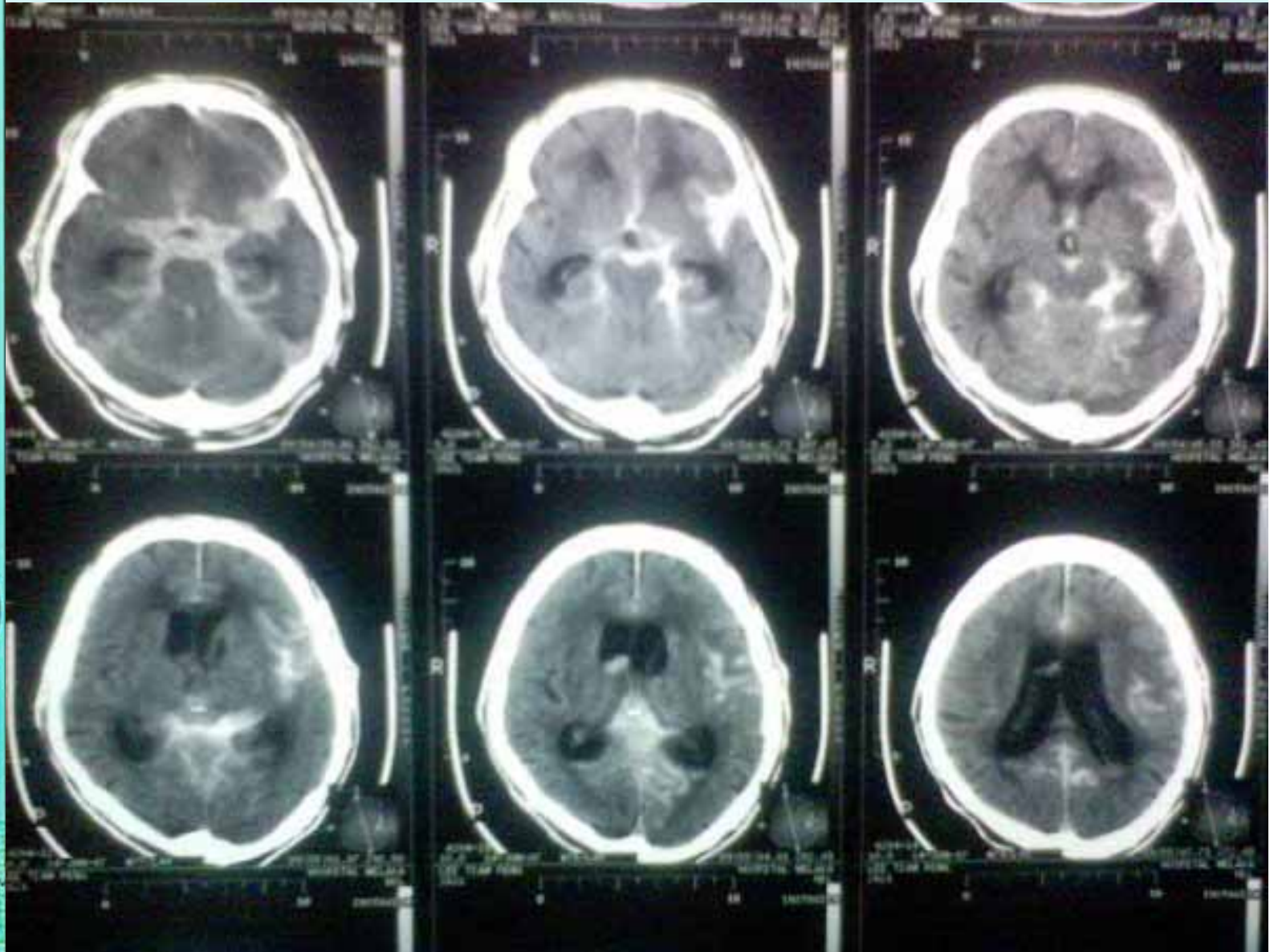


Sub Arachnoid Hemorrhage (SAH)

- Headache - 97% of patient
- “worst headache of my life”
- Sudden onset, vomiting, neck pain, photophobia
- Loss of consciousness
- Cranial Nerve Palsy (III)
- Rarely low back pain (irritation of lumbar nerve roots)
- Unilateral ptosis with orbital or supra orbital pain is suggestive of rapidly expanding aneurysm



Sub Arachnoid Hemorrhage (SAH)



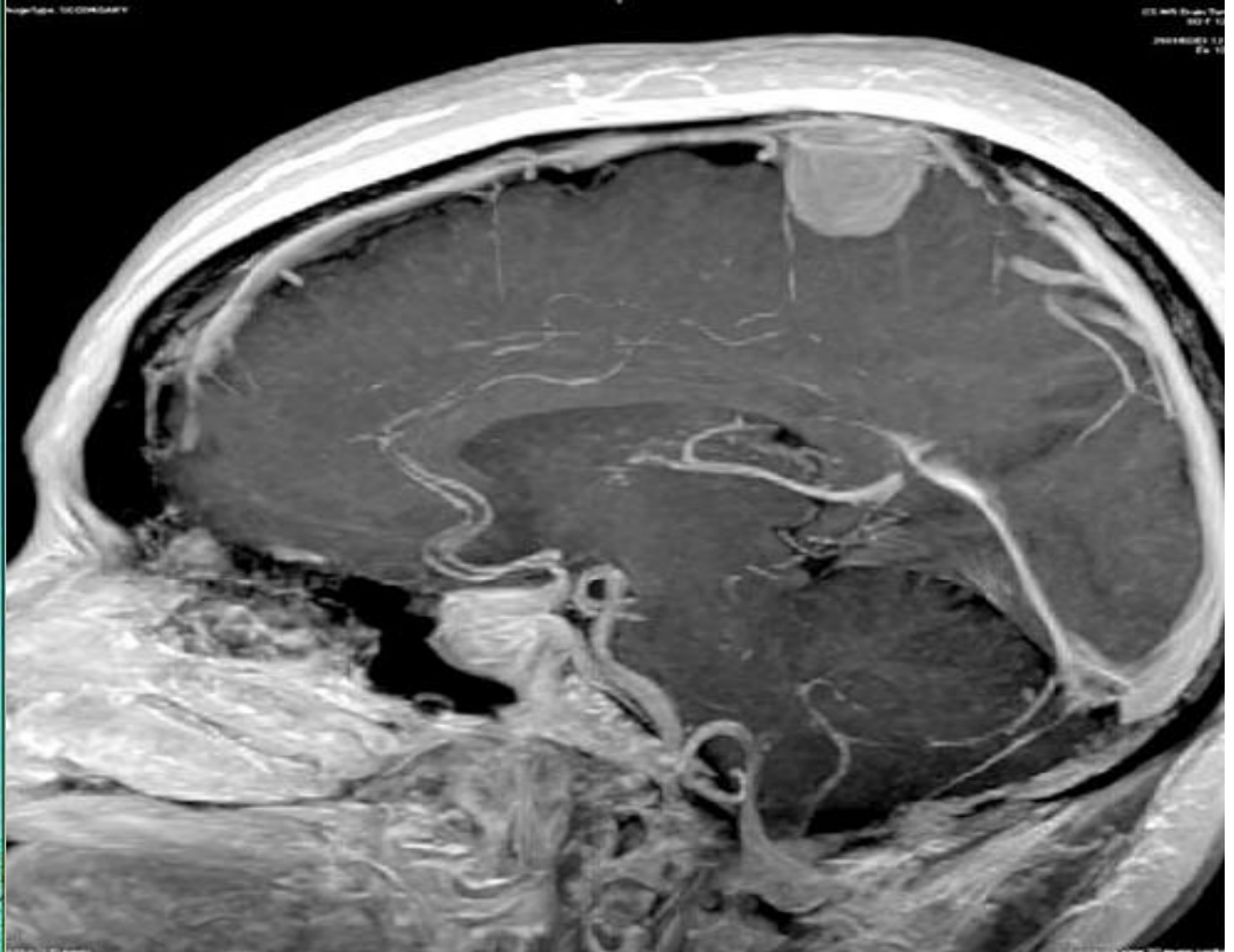
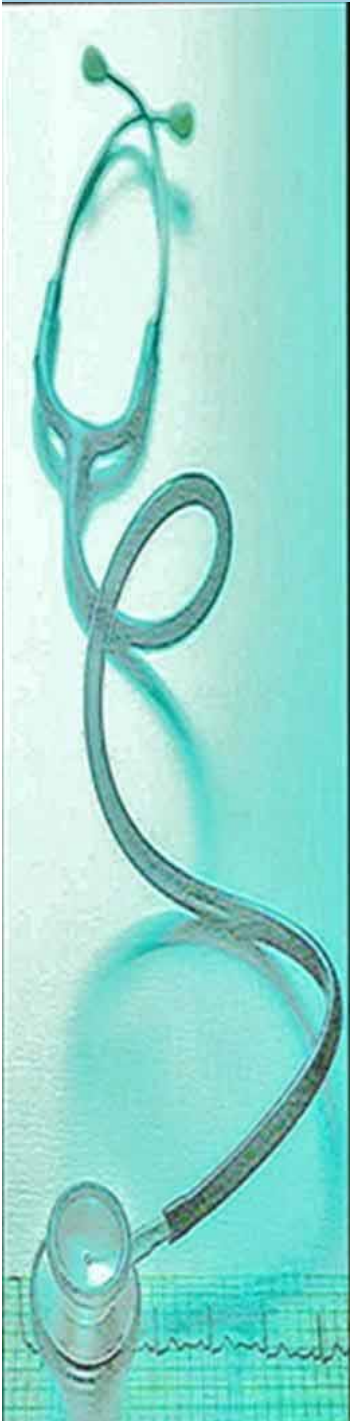
SAH

SENTINEL HEMORRHAGE

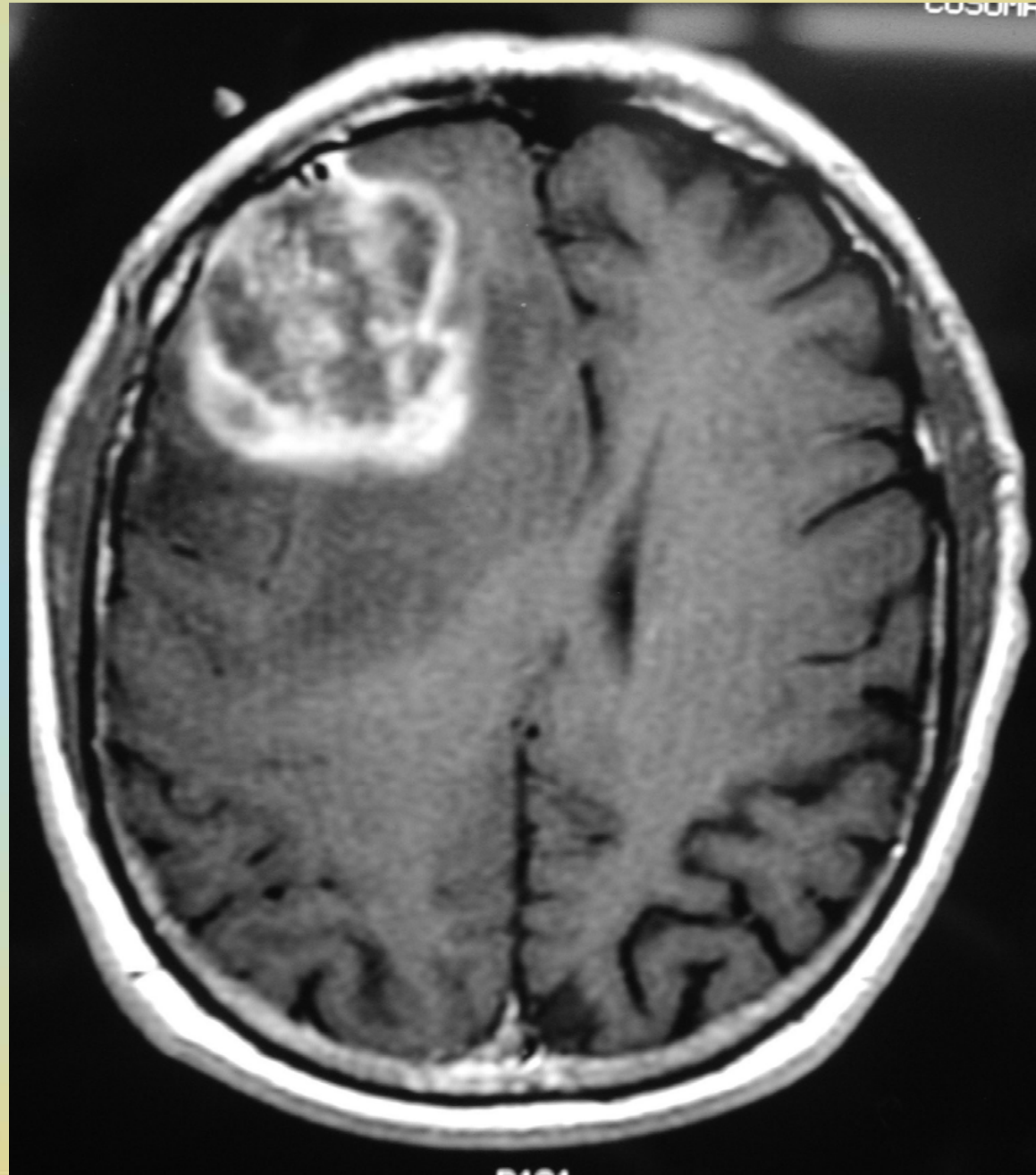
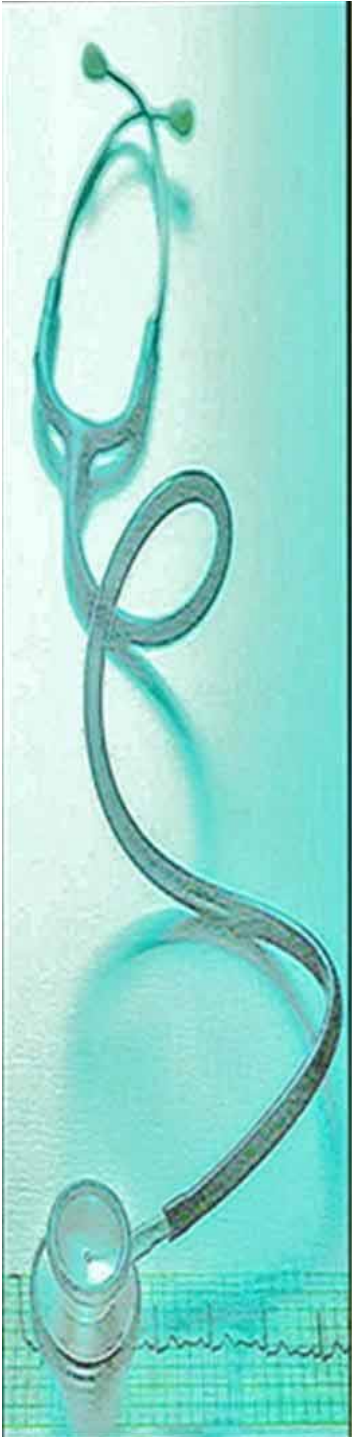
- Warning Headache
- Present in 30-60% of patients
- Few hours to few weeks before rupture
- Sentinel hemorrhage is often unrecognised

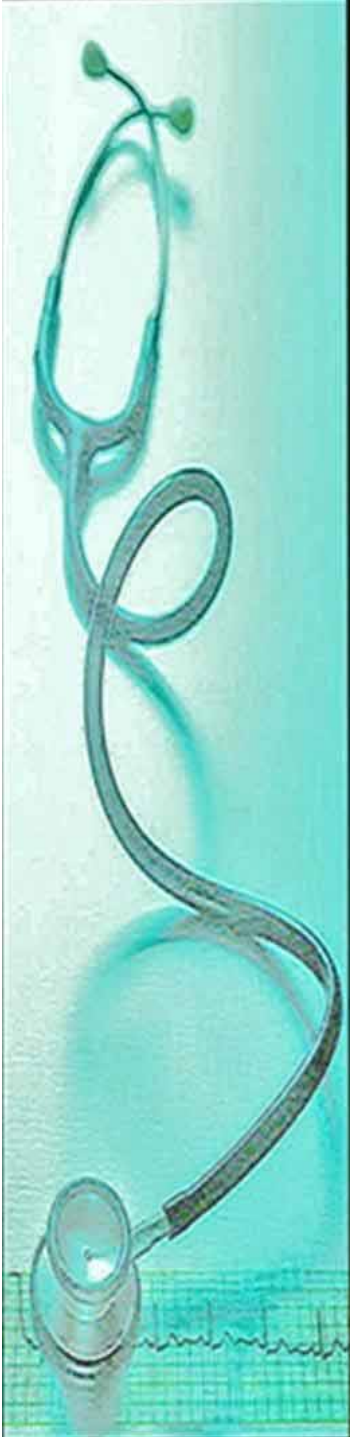


NEOPLASM (Brain Tumour)



Brain Tumour



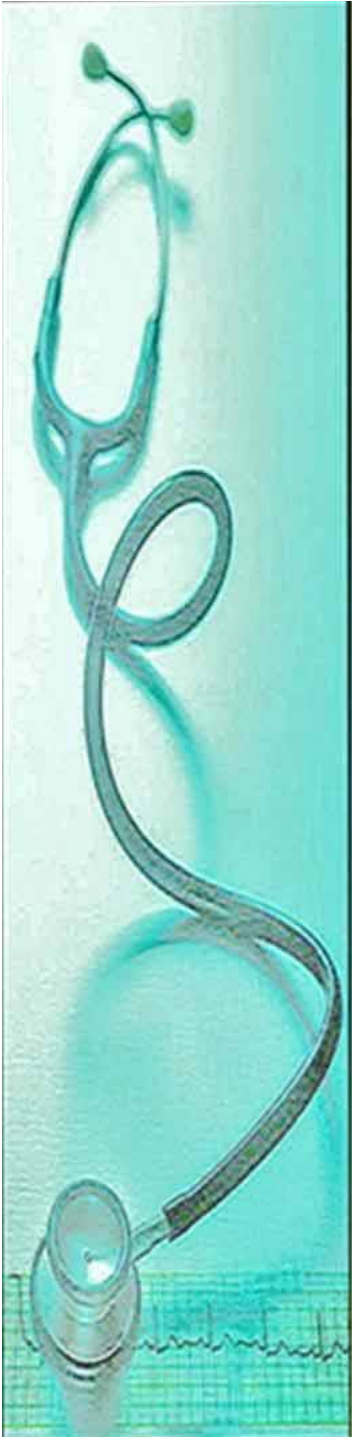


Headache(H/A) with Brain Tumours - I

- H/A present in 54%
- H/A – Worse in the morning, increase by coughing, straining, bending forward
- Nausea/Vomiting – 45%
- Progressive neurological deficit (68%)
(Motor Weakness - 45%)
- Seizures - 26%

Headache(H/A) with Brain Tumours - II

- Tension headache – 77%
- Migranous headache – 10%
- Only 8% showed classic brain tumor Headache
- Only 2/3 had raised ICP





Headache with Brain Tumour - III

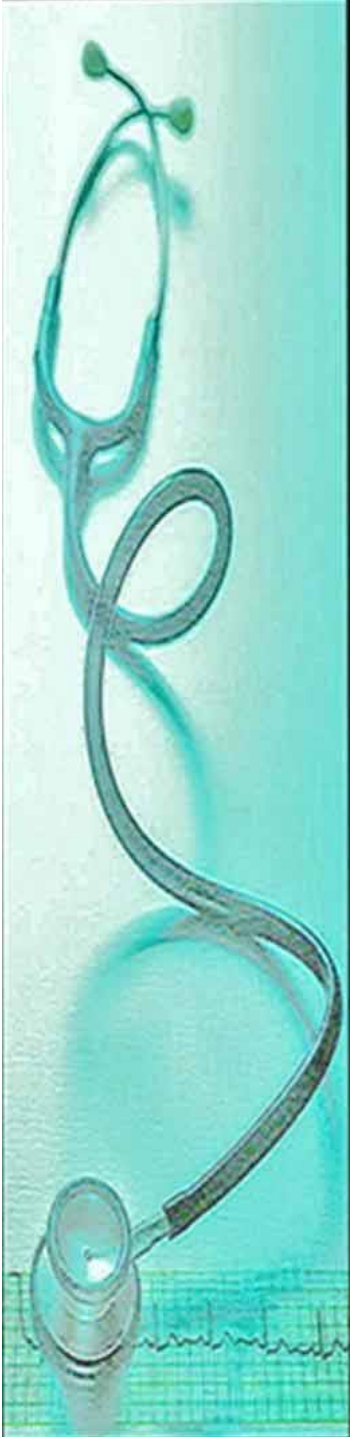
Brain is not pain sensitive

1. Raised ICP

- Tumor mass effect
- Hydrocephalus
- Mass effect from oedema
- Associated tumoral Hemorrhage

2. Invasion or compression of pain sensitive structures

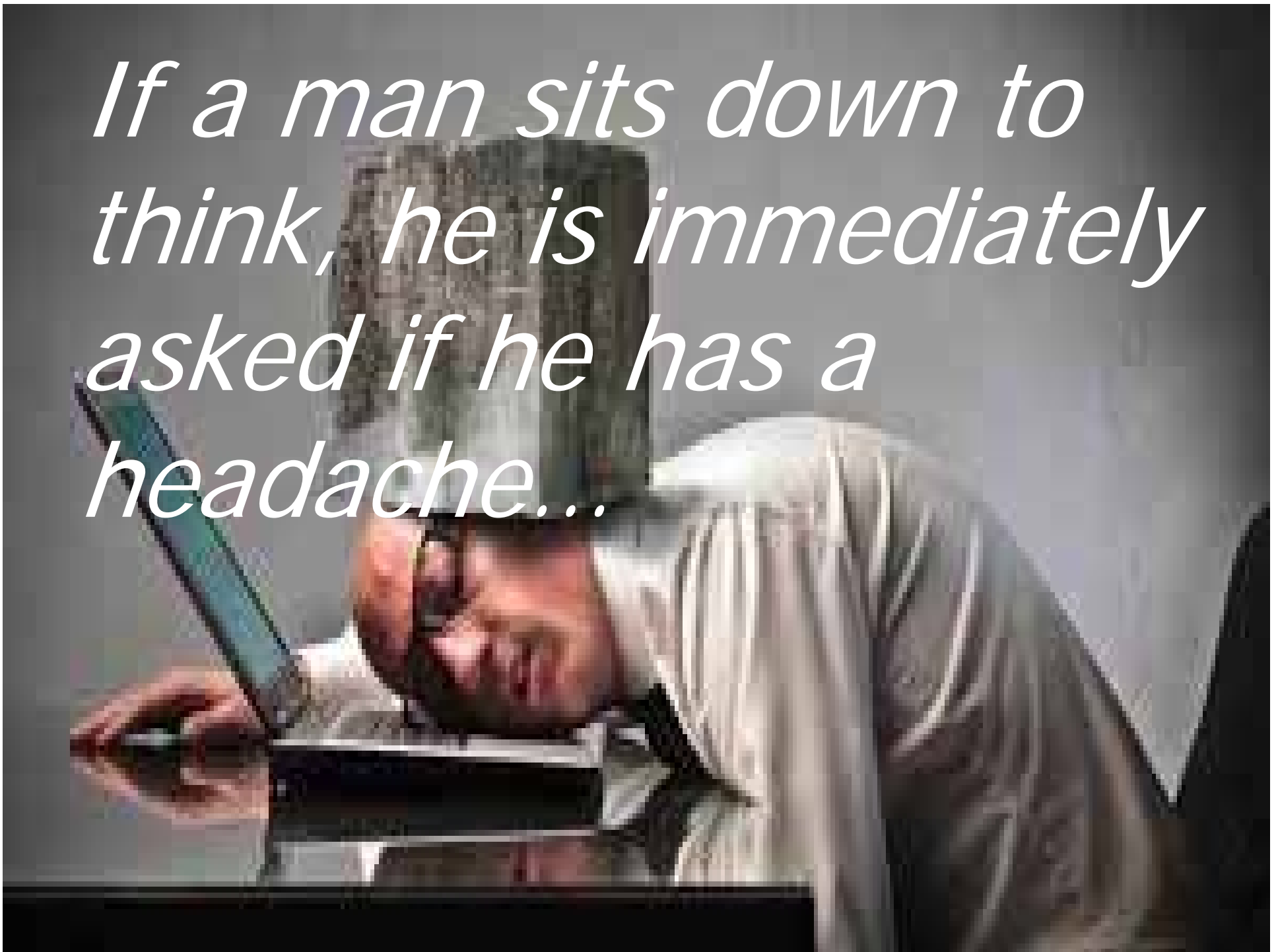
- Dura
- Blood vessels
- Periosteum



Headache with Brain Tumour - IV

- Secondary to difficulty with vision
- Diplopia (III, IV, VI)
- Difficulty focussing
 - Optic Nerve Dysfunction from invasion or compression
- Extreme Hypertension from raised ICP (Cushing Triad)
- Psychogenic

If a man sits down to think, he is immediately asked if he has a headache...

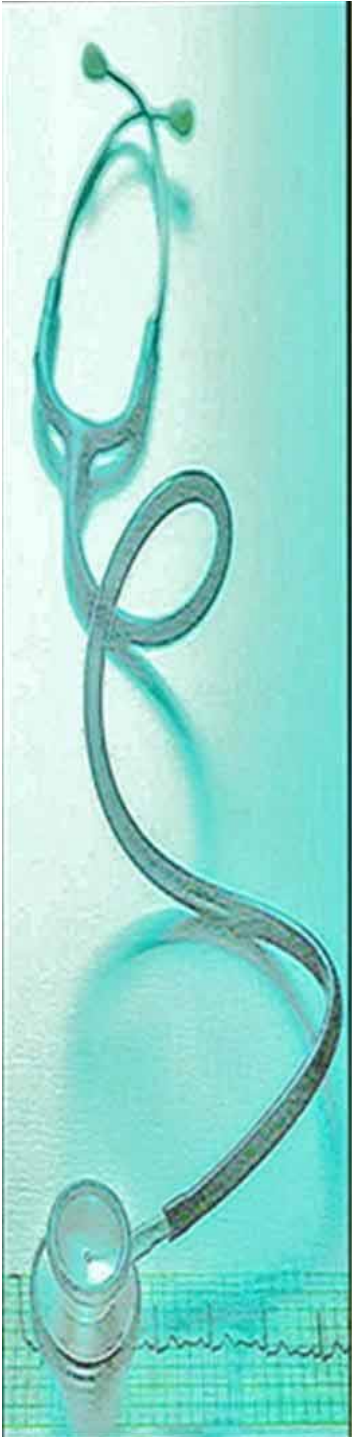




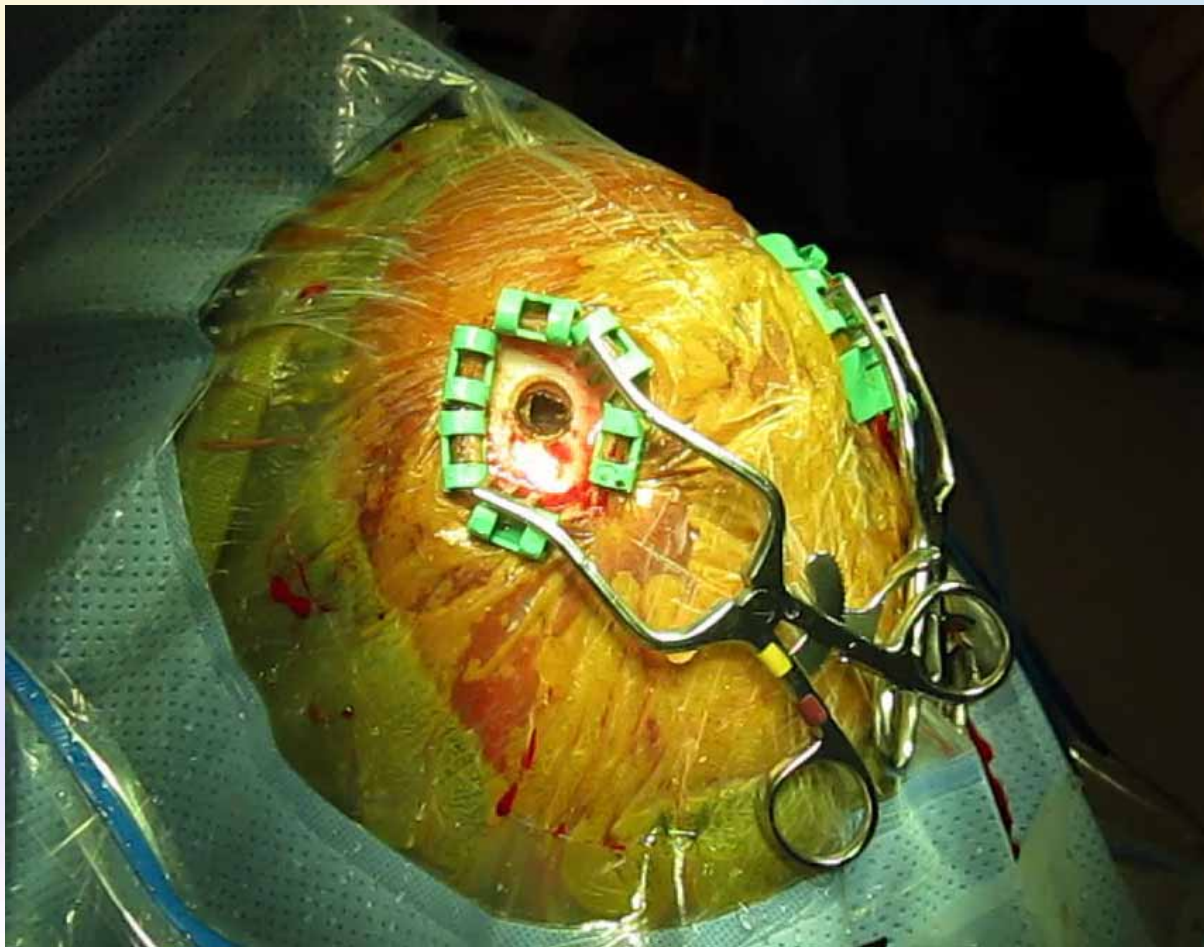
Chronic Subdural hematoma

- Elderly > 63yrs
- History of head injury only in 50%
- Risk Factors
 - Alcohol Abuse
 - Seizures
 - CSF Shunting
 - Coagulopathies
 - Frequent history of falls (Hemiplegic patients)
- Minor symptoms of headache, Confusion, Language difficulties, TIA like symptoms, Coma, Hemiplegia, Seizures

Chronic Subdural Haematoma

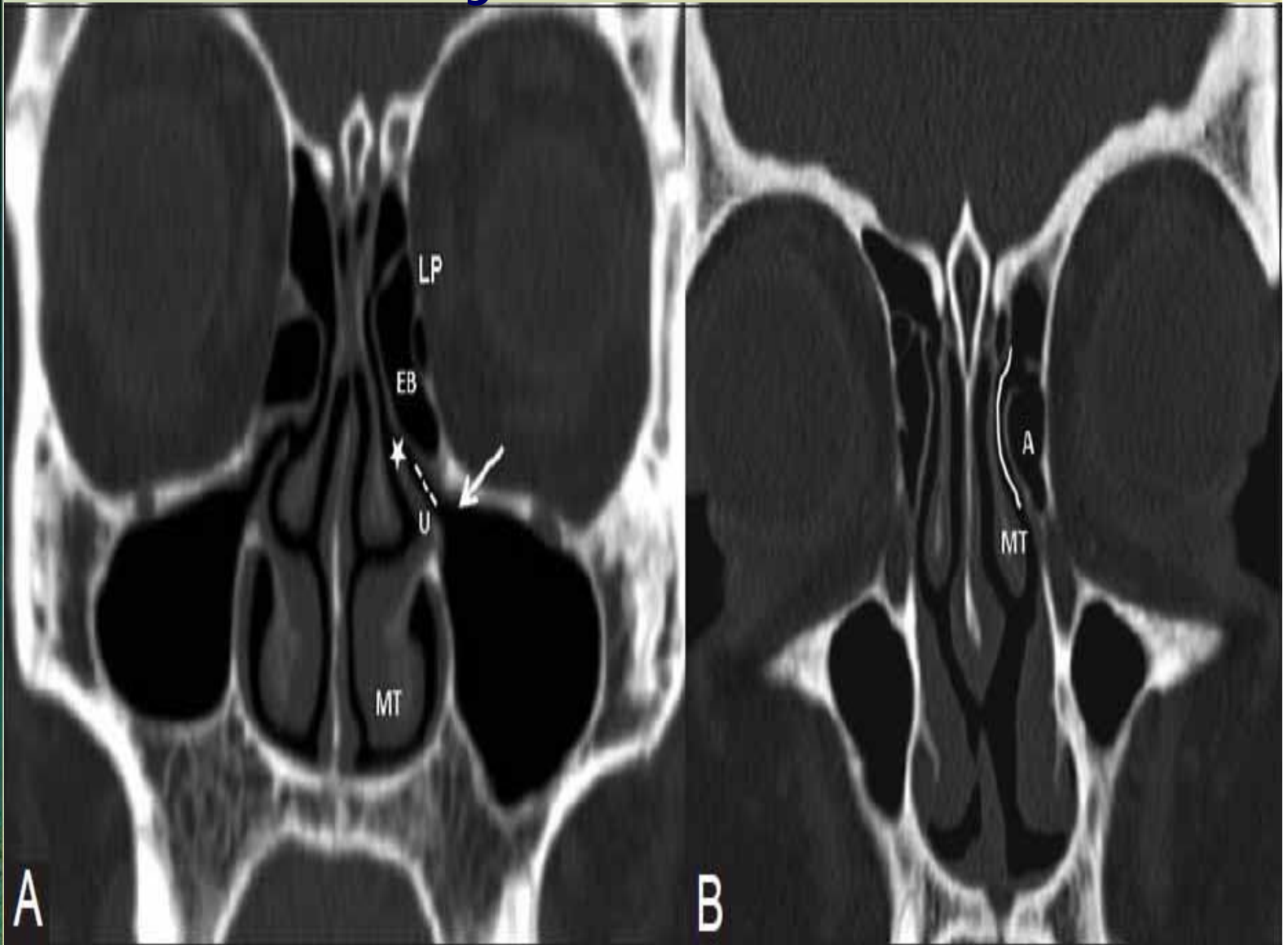
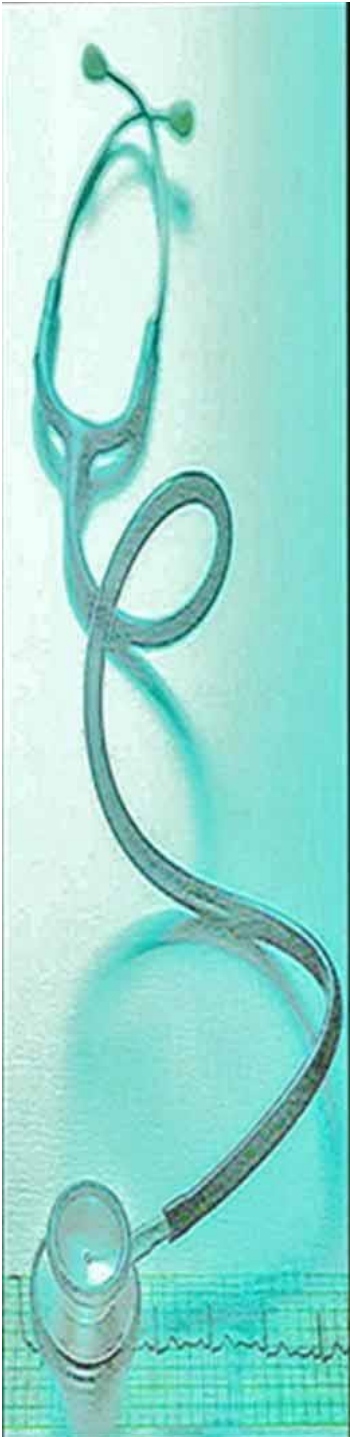


Burr holes drainage of chronic subdural hematoma





Anterior Ethmoidal Nerve Syndrome





Anterior Ethmoidal Nerve Syndrome

- Middle Turbinate Headache Syndrome
- Contact point headaches (Sluders Neuralgia)

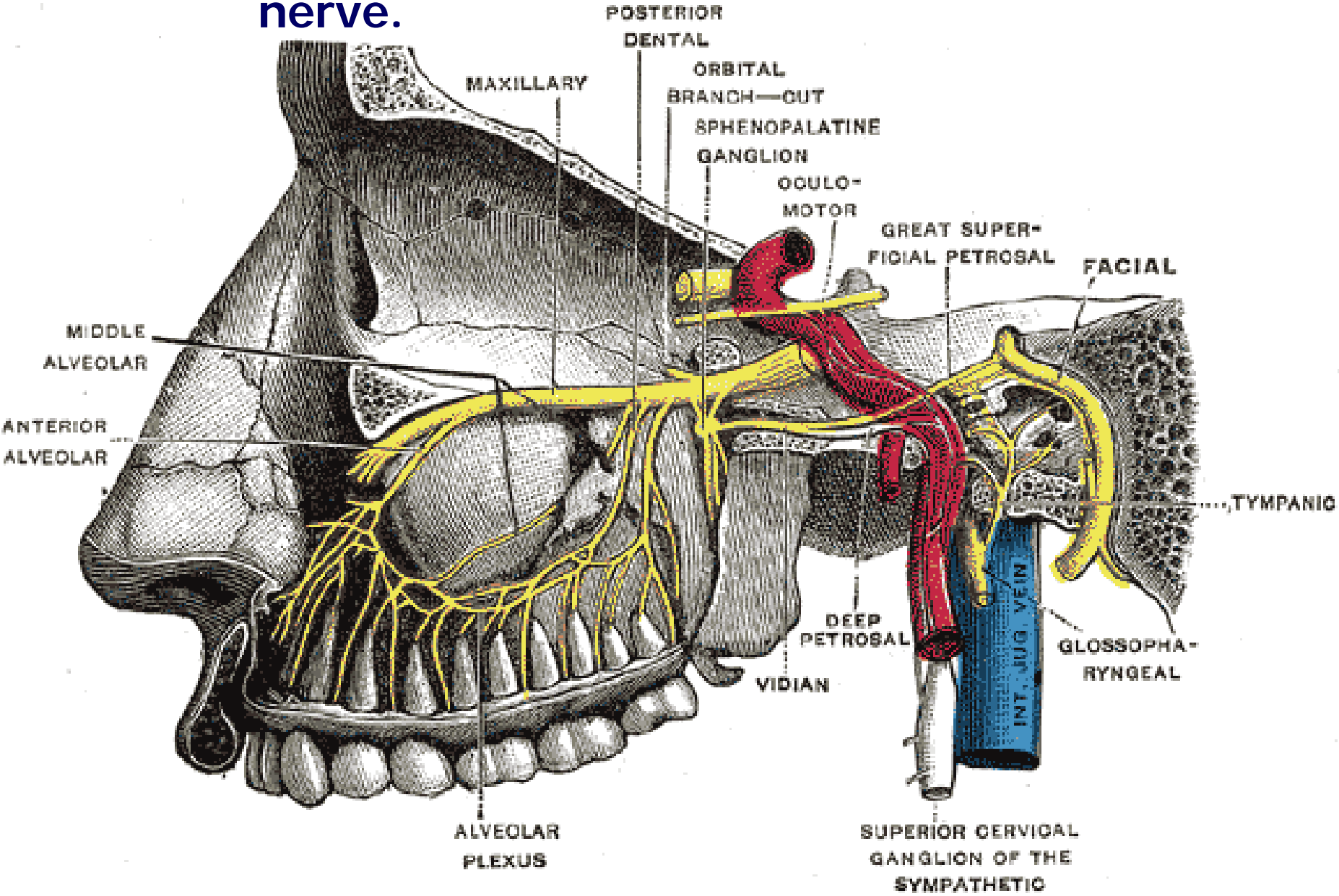
A series of symptoms resulting from the irritation of the terminal branches of the anterior ethmoidal nerves.

Referred pain arising from this nerve are chiefly of the sinus type but may also take the form of headache and migranous type.

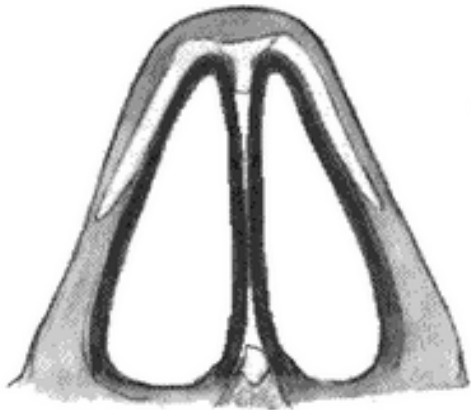
- Pain over the medial canthus, supra orbital region, periorbital pain due to middle turbinate compression against the nasal septum.

- **Diagnosis – High Index of suspicion – CT Scan**
- **Investigation – CT Scan Anterior Rhinoscopy, Lidocaine Test**
- **Treatment – Partial middle turbinectomy and Septoplasty**

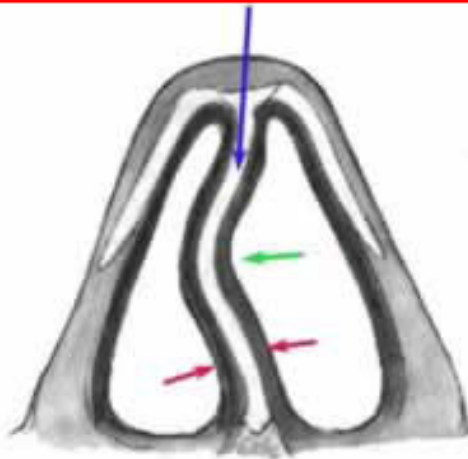
Anterior Ethmoidal Nerve is a branch of ophthalmic division of the trigeminal nerve.



Anterior Ethmoidal Nerve Syndrome



Normal Straight Septum



Deviated Septum (Green Arrow)

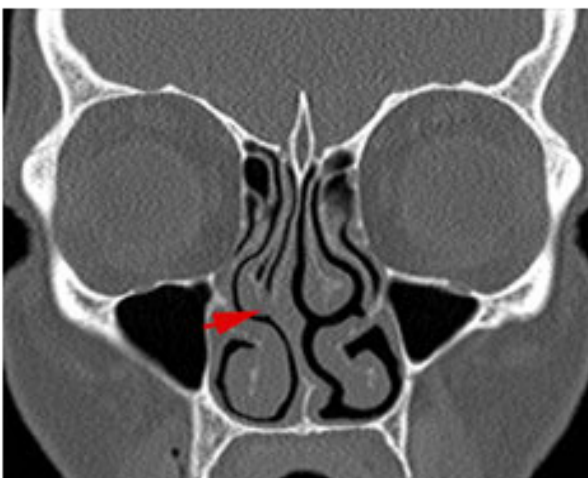


Septal Spur (Arrowhead)

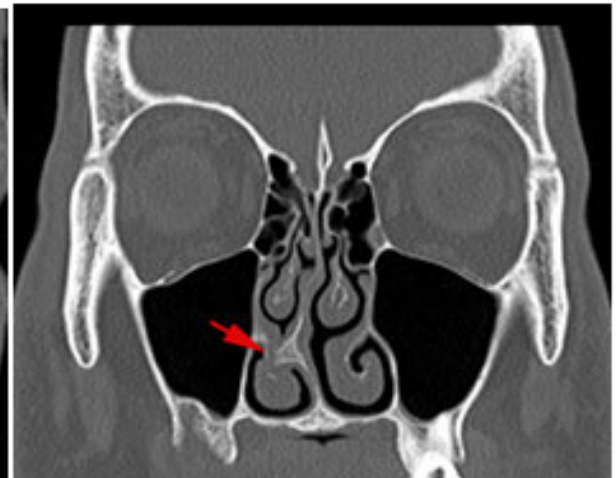
Here are corresponding CT scans showing normal and the septal abnormalities:



Normal Straight Septum



Deviated Septum (Red Arrow)



Septal Spur (Red Arrow)



PITUITARY APOPLEXY

- Incidence-1.5-2.7 % of cases of pituitary adenoma
 - Headache
 - Nausea/vomiting
 - Diplopia
 - Vision or Visual field defect (VA-52 %; VF-64%)

Pituitary apoplexy



Sudden blindness in a young woman. Hemorrhagic pituitary macroadenoma. Urged trans-sphenoidal surgery for presumed pituitary apoplexy. This latter condition is a rare clinical syndrome that corresponds to the acute hemorrhagic or ischemic transformation of a tumor-containing or normal adenohypophysis.

SYMPTOMS AND SIGNS

- Occular paresis -78%
- Cavernous sinus III, IV, VI
- Unilateral dilated pupil
- Vertical diploplia CN IV
- Horner's Syndrome- sympathetic fibres
- Stroke, vasospasm due to compression of ICA

CAUSES

- Bromocriptin
- Pregnancy
- Endocrine stimulation test
- Trauma
- Thrombocytopenia
- Sheehan syndrome
- Necrosis of anterior pituitary gland in the puerperium

TREATMENT

- Emergency –Rapid replacement with hydrocortisone-may e life saving
- Fluid electrolyte balance
- Haemodynamics stability
- Surgery- vision and level of consciousness



HYDROCEPHALUS

- Increase in the amount of CSF
 - Blockage
 - Decreased absorption
 - Increased production

CAUSES

Trauma

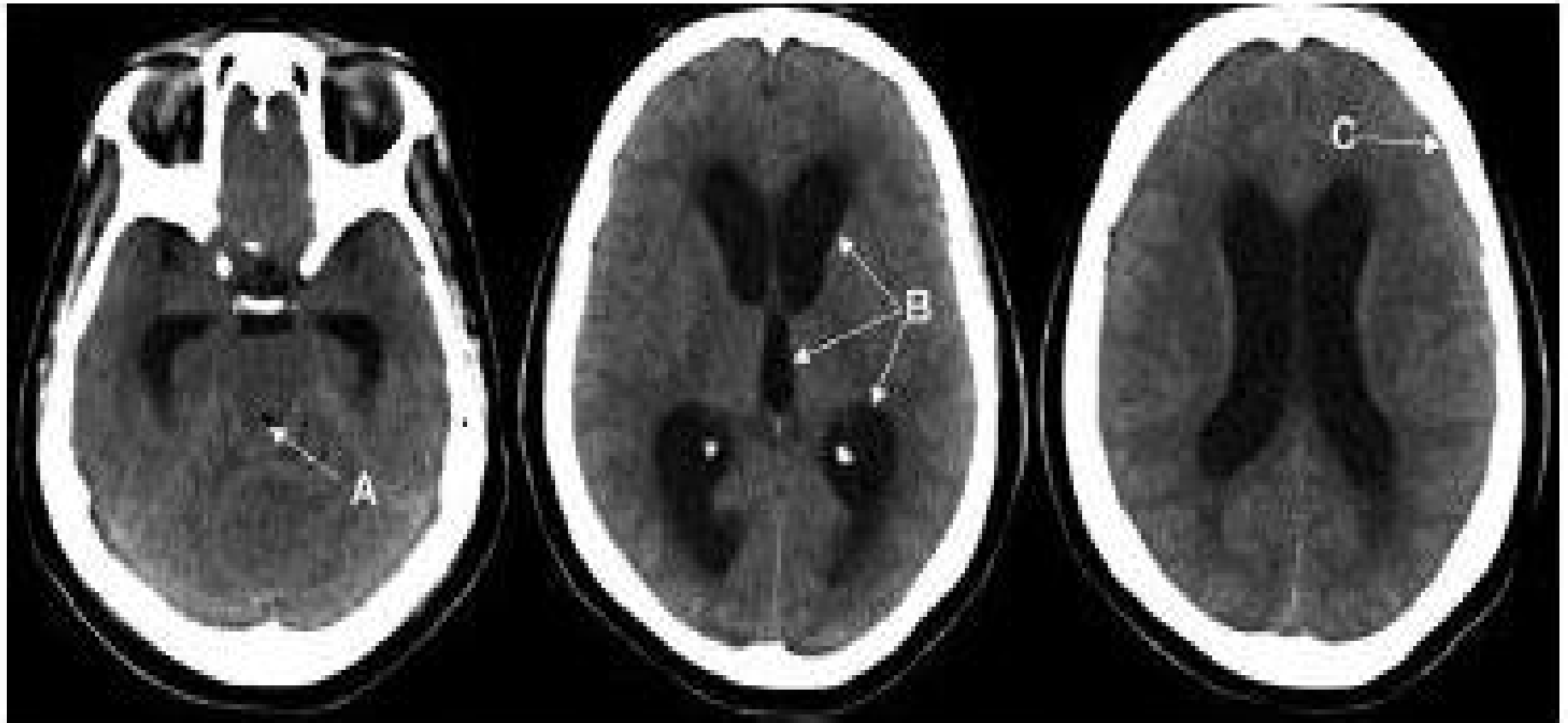
Tumours

Infectiong

Haemorrhage

Post surgery

Figure 19. Hydrocephalus

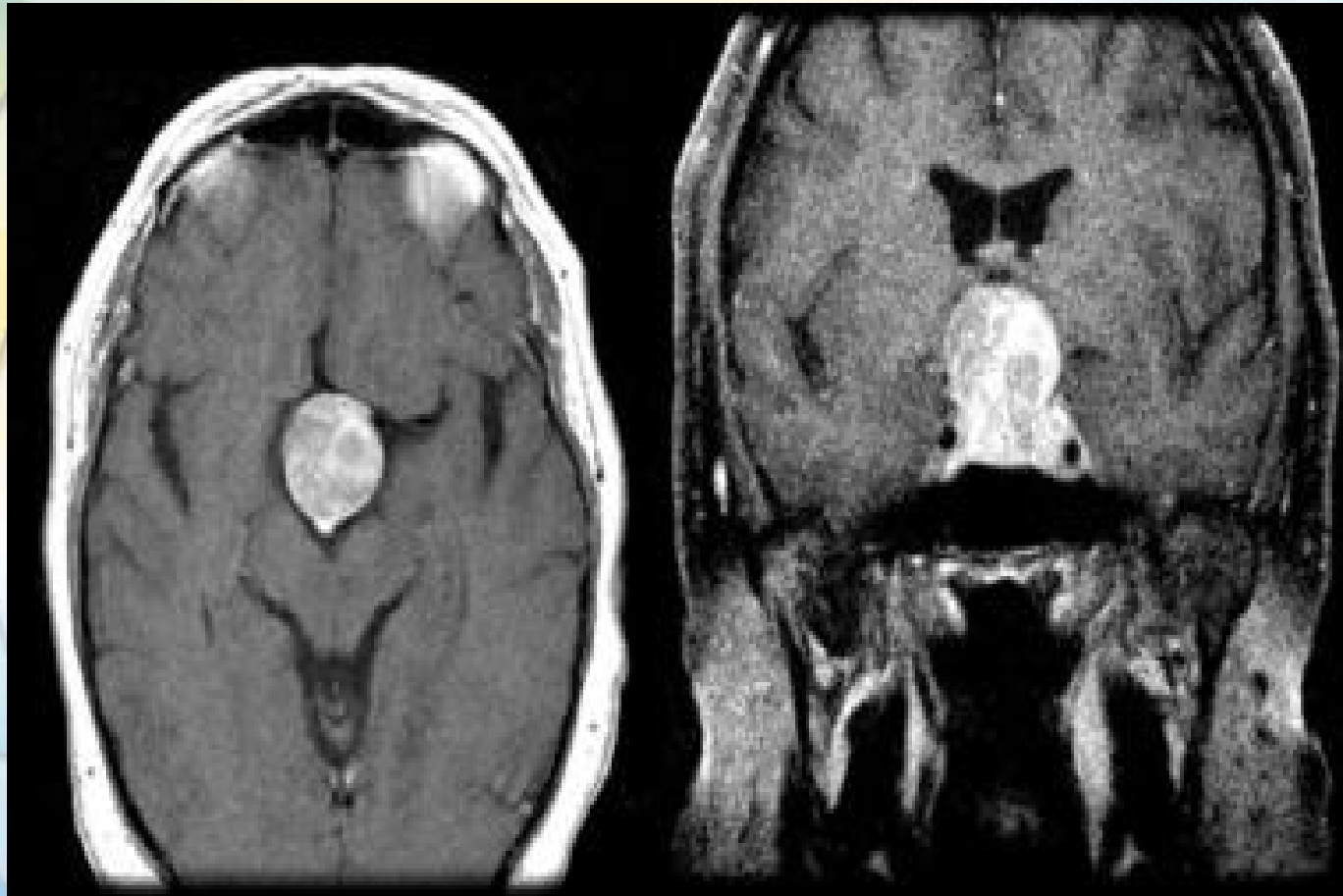


In hydrocephalus, the basilar cisterns (A, arrow) are effaced, as are the sulci (C). The lateral and third ventricle are enlarged (B).

© 2007 Joshua Broder.







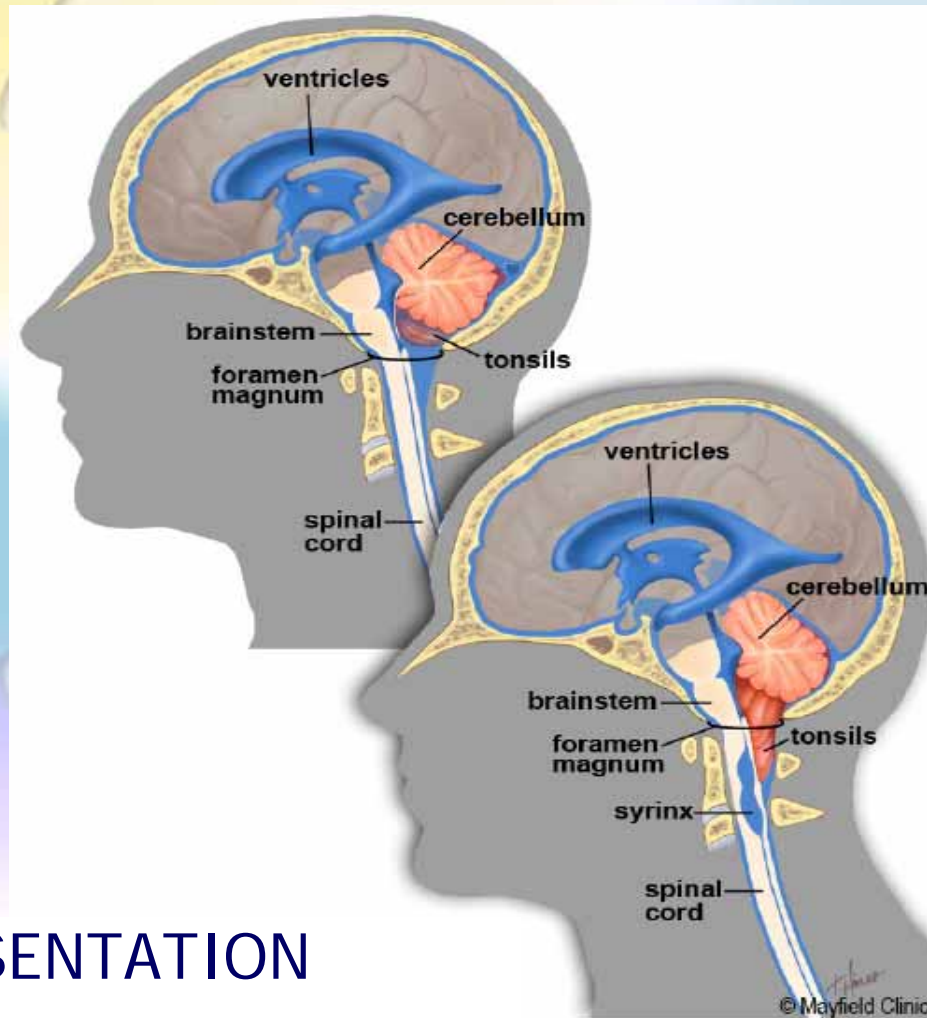
SYMPTOMS

- Progressive headache
- Vomitting
- Behavioral changes
- Drowziness, Lethargy
- Visual deterioration

TREATMENT

VPS (ventriculoperitoneal shunts)
ETV (endoscopic third
ventriculostomy)

CHIARI MALFORMATION



CASE PRESENTATION

CHIARI MALFORMATION (Type 1)

- Incidence-0.5%
- Caudal displacement of the cerebellum with Tonsillar herniation below the foramen magnum
- Pial and arachnoid Fibrosis around brain stem and tonsils
- Hydromyelia and syringomyelia
- Age-12-73 years (Average 41 years)
- Female to male ratio 1.3:1

SYMPTOMS

- Headache (suboccipital)
- Lhermite sign
- Spasticity- lower limbs
- Weak grasp-upper limb
- Unsteady gait
- Tinnitus
- Vomitting, dysarthria
- Dizziness, deafness, fainting

CHIEF COMPLAINTS

Patient 1

D.O.A : 10.04.15

Female, 53 years old

1. Cervico occipital headache (2 years)
2. Numbness of all 4 limbs
3. Resting tremor & Dizziness
4. Dysarthria on and off

ON EXAMINATION

1 .General physical examination:

- Conscious, alert, oriented
- Generalised resting tremor
- Ataxic gait
- No dysarthria

2. Systemic examination :

- Within normal limits

3. CNS :

- GCS: 15/15
- Hyperreflexia of upper and lower limbs
- Clonus bilateral lower limbs +
- Romberg+
- Hoffman+

INVESTIGATIONS

BASELINE:

Within normal limits

SPECIFIC (Radiological):

MRI brain and cervical spine:

There is herniation of the cerebellar tonsils

In the cervical cord, there is a well defined septated CSF filled intramedullary lesion (from the level of C2/C3 to C6/7)

Impression:

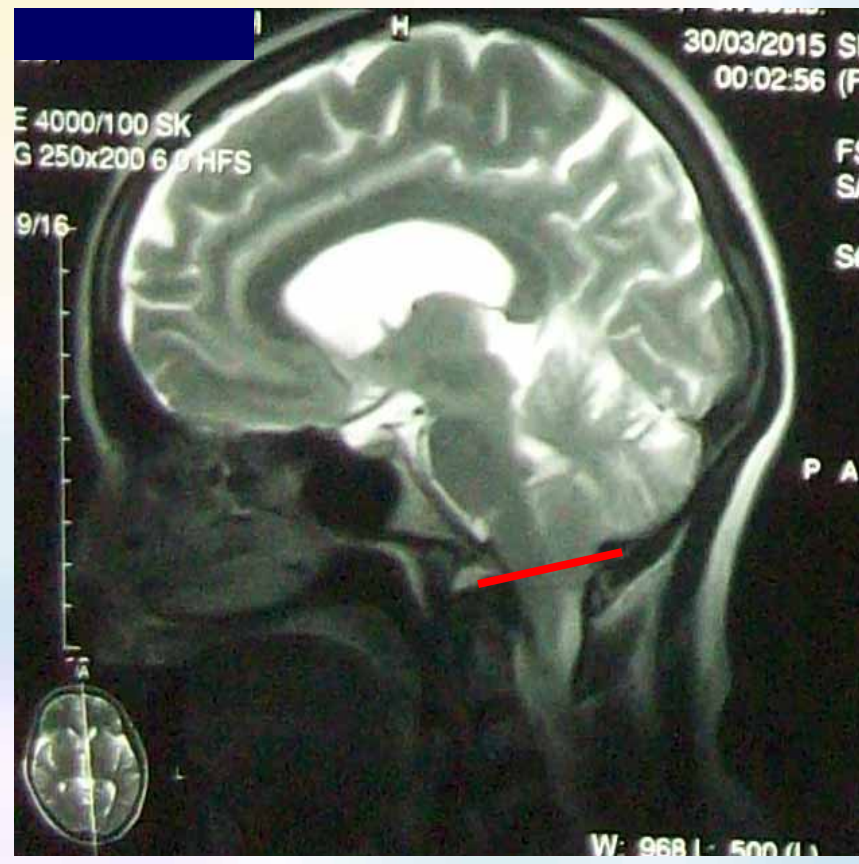
Arnold Chiari malformation with associated syringomyelia



Herniation
of
cerebellar
tonsils
below rim
of foramen
magnum

Syringomyelia





Herniation of the cerebellar tonsils

PATIENT 2

Female, 48 years old

D.O.A : 18.04.15

PMH: BA on MDI

PSH: 1. Appendicectomy

2. B/L L5 Laminectomy

(excision of herniated disc L5S1 in 2011)

Social Hx: Health Care Assistant

Non smoker, No alcohol intake

Drug allergy : Nil

CHIEF COMPLAINTS

1. Cervico occipital headache
2. Intermittent SOB and Respiratory Distress
3. Dysphagia

ON EXAMINATION

1. General physical examination:

- Conscious, alert, oriented
- No dysarthria
- Not in respiratory distress

2. Systemic examination:

- Within normal limits

3. CNS

- GCS: 15/15
- Power and sensation normal
- Unremarkable examination

INVESTIGATIONS

BASELINE:

-Within normal limits

SPECIFIC (Radiological):

CXR:

-within normal limits

MRI of brain and cervical spine:

-Arnold Chiari Malformation and syringomyelia at C2/C3 and C7/D1.



Herniation of tonsils

Syringomyelia

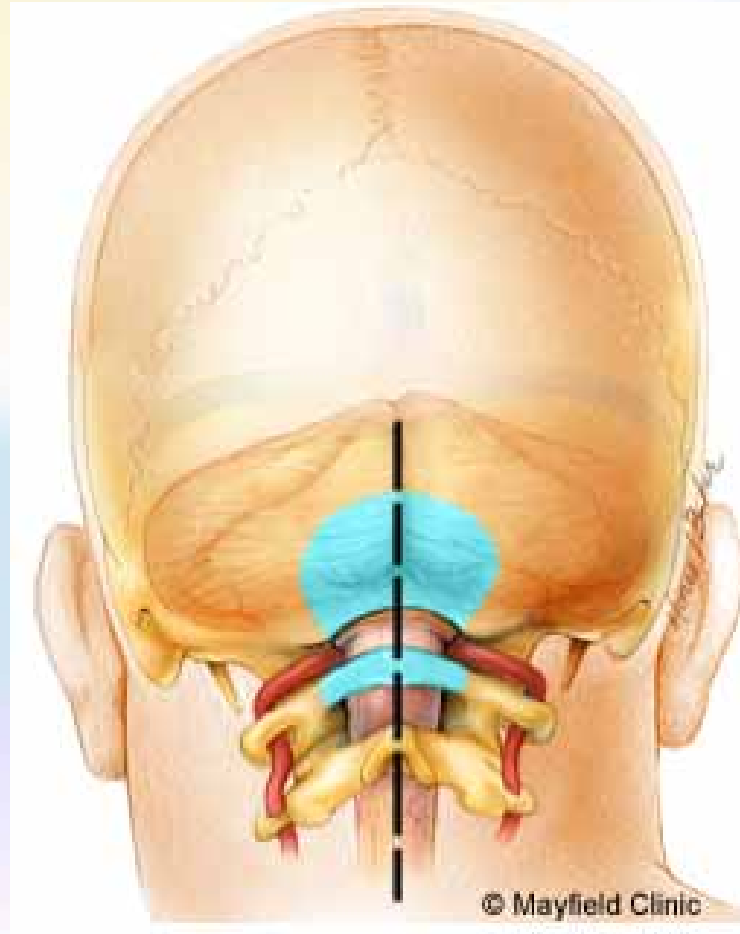


1. Position



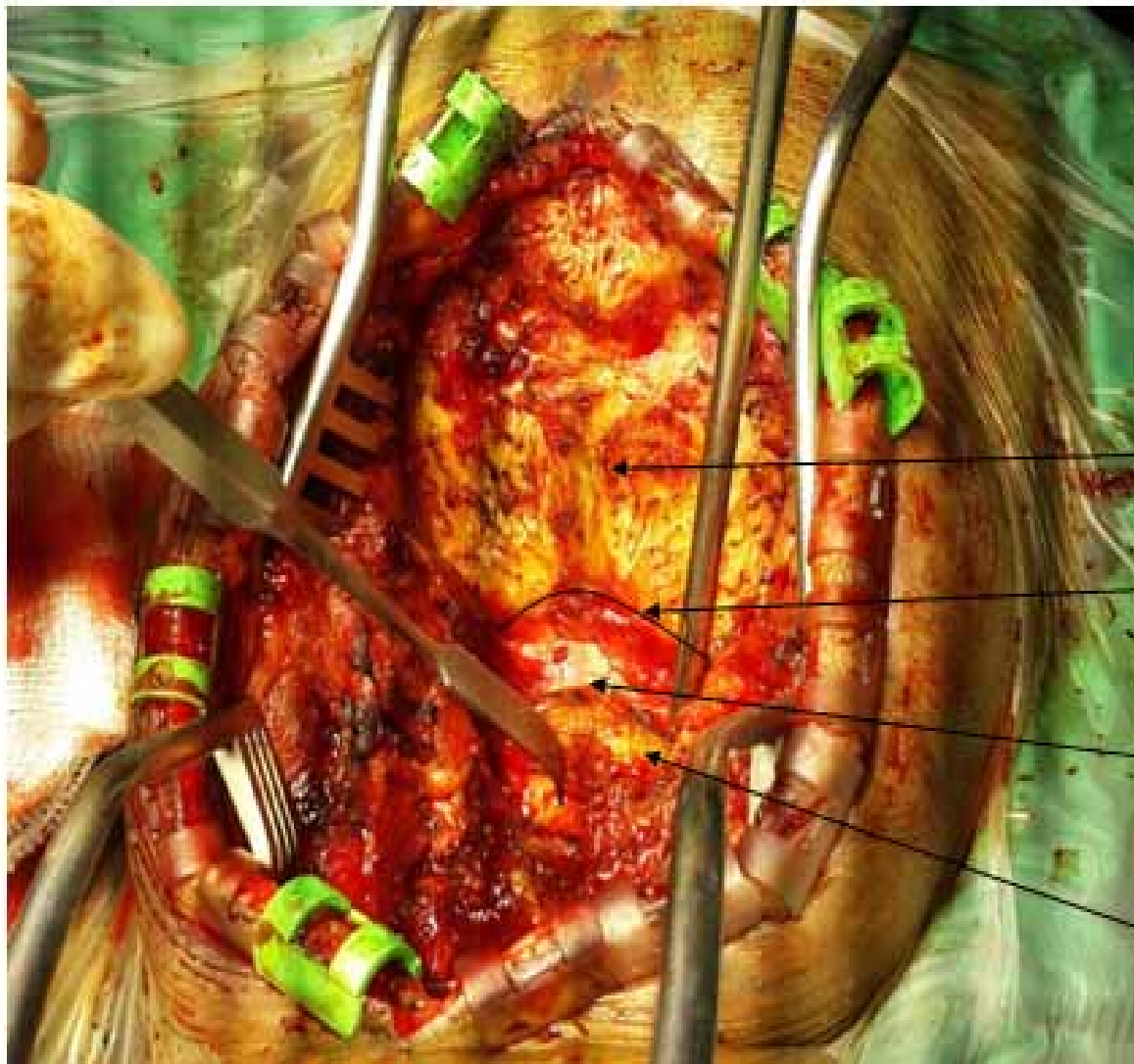
Mayfield 3-points rigid head fixation

2. Skin Incision (1)



An incision is made
down the middle of the

3. C1 excision (1)



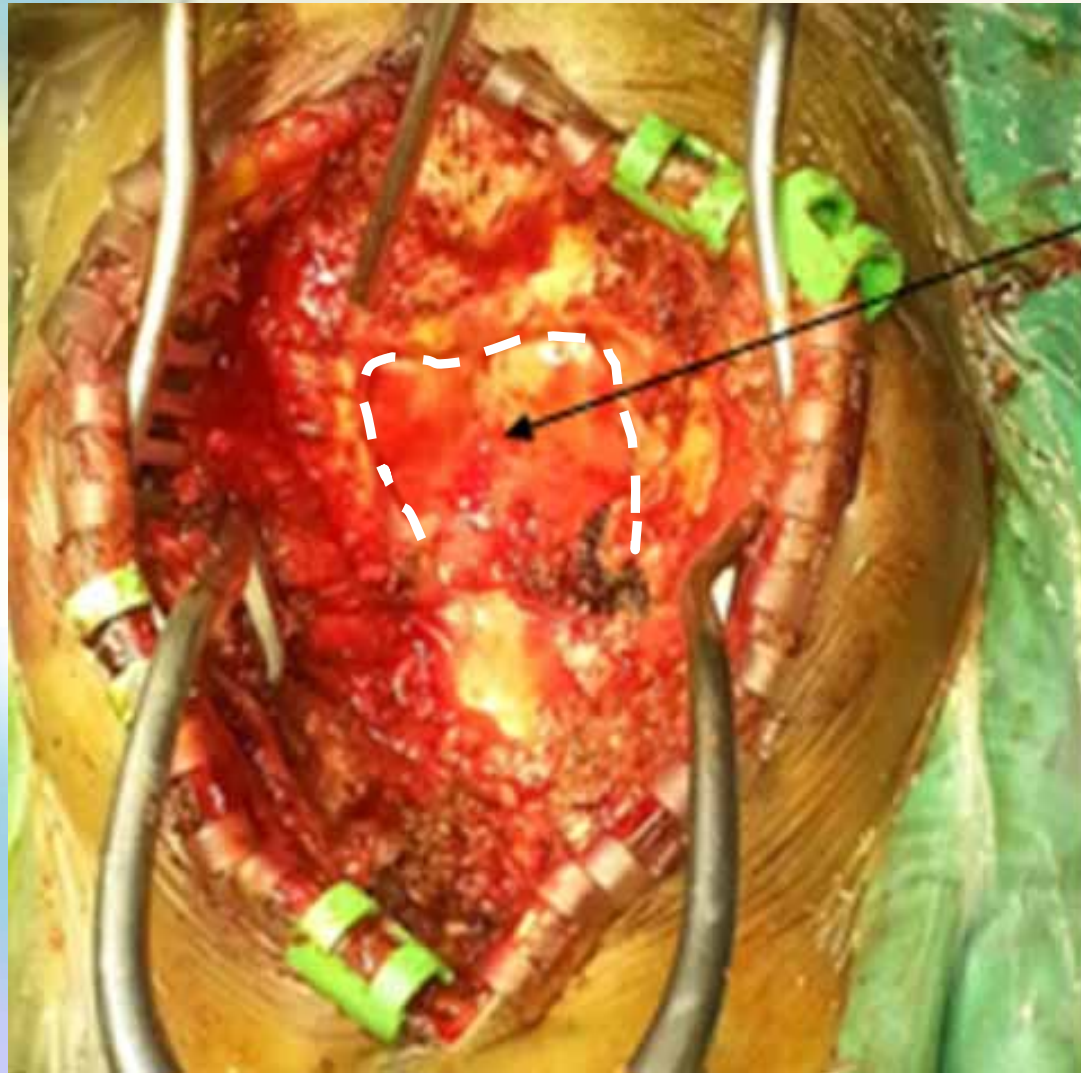
Occipital bone

Foramen
Magnum

Atlanto
occipital
membrane

Arch of C1

4. Suboccipital craniectomy (2)

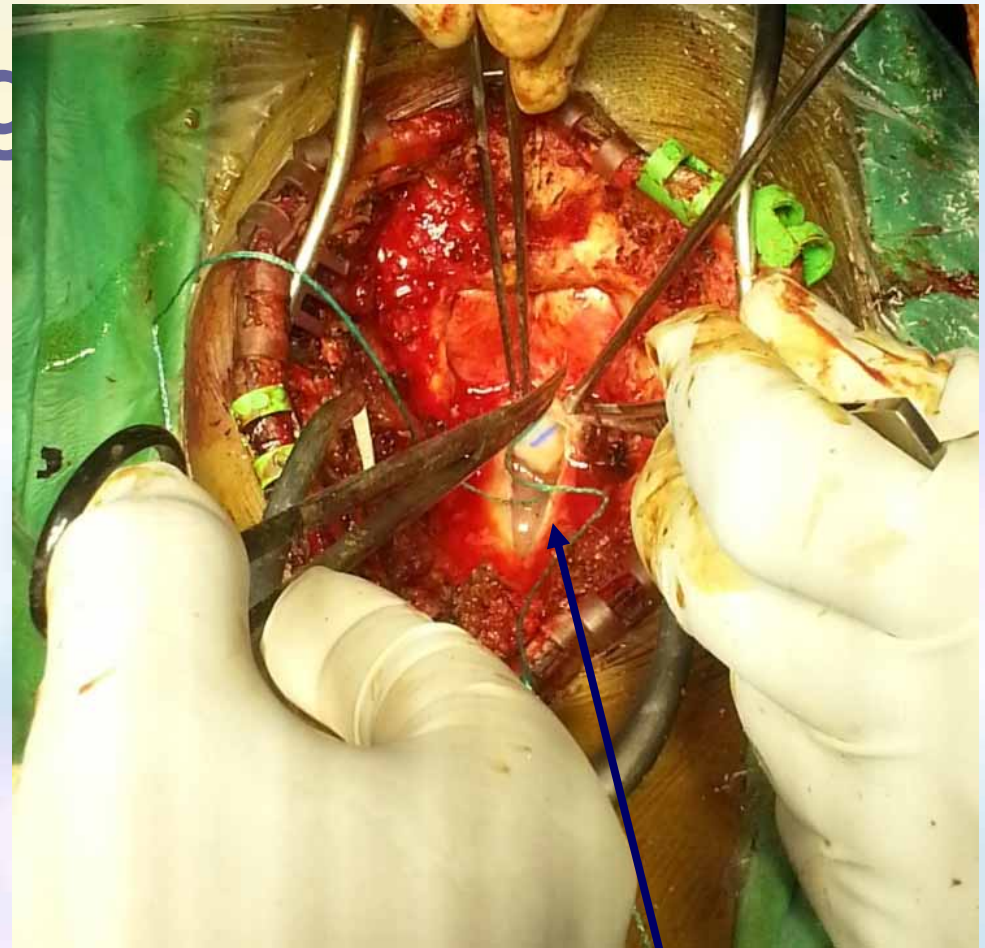
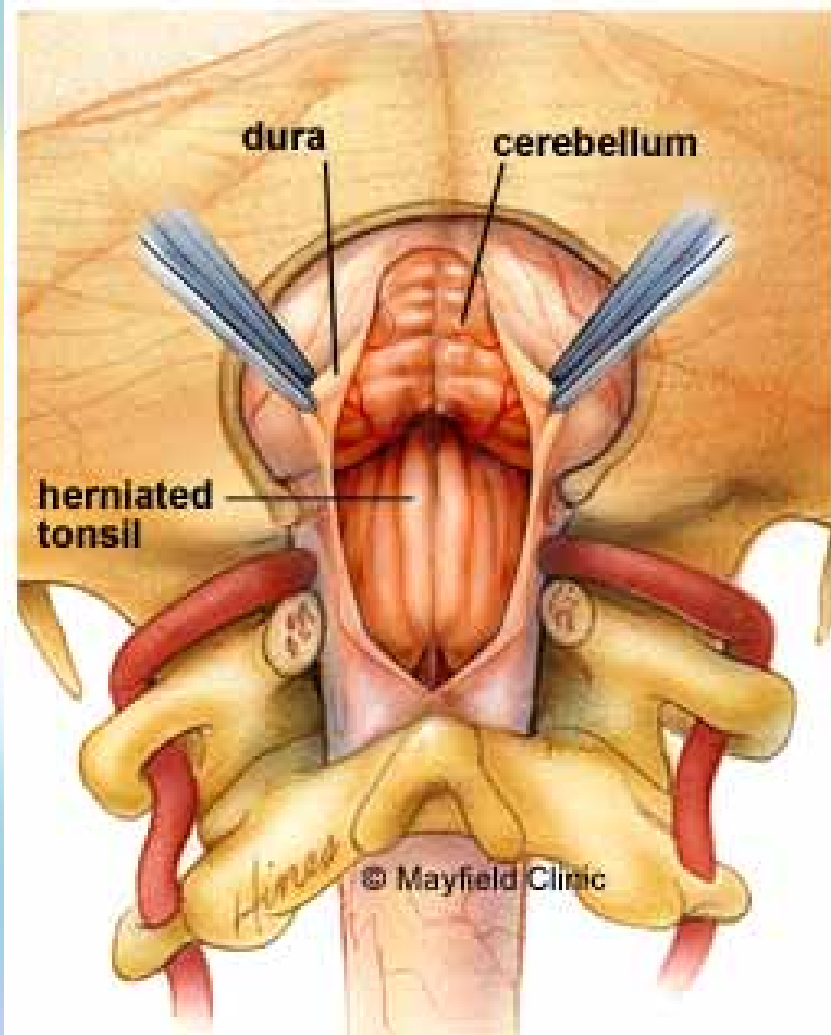


Craniectomy

4. Suboccipital craniectomy video



5. Opening



Dura

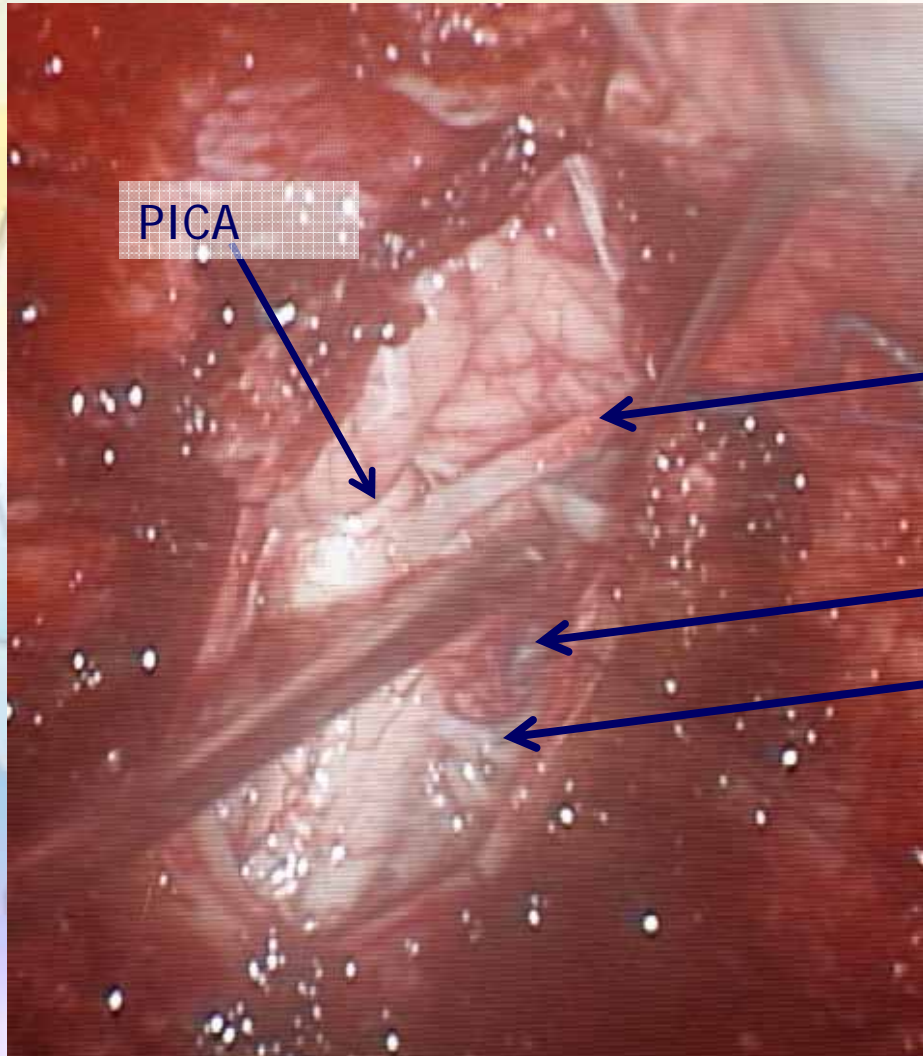
6. Use of microscope - Microneuro surgery



NC-4 microscope



7.Descent of hindbrain (3)



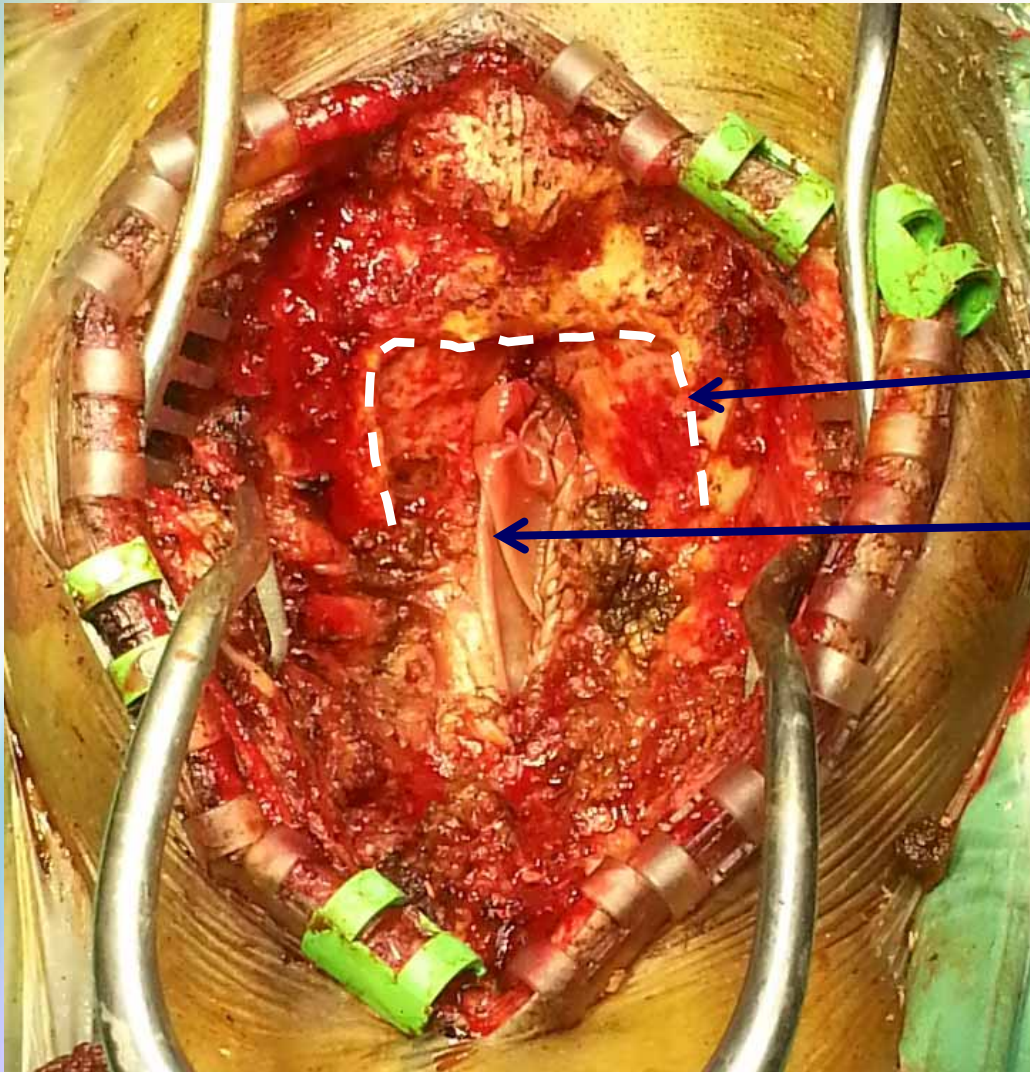
PICA

Cranial nerves

Vertebral
artery

Cervical
nerve

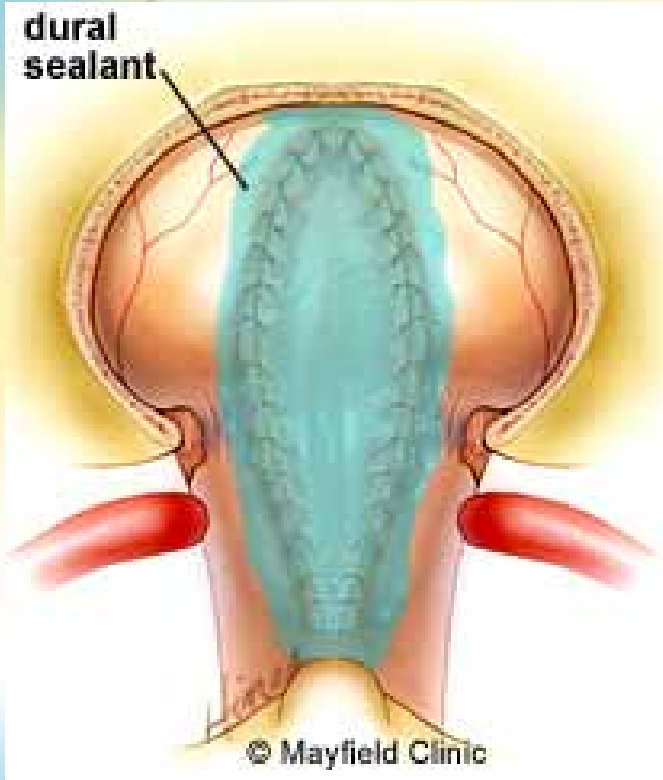
8. Duroplasty (3)



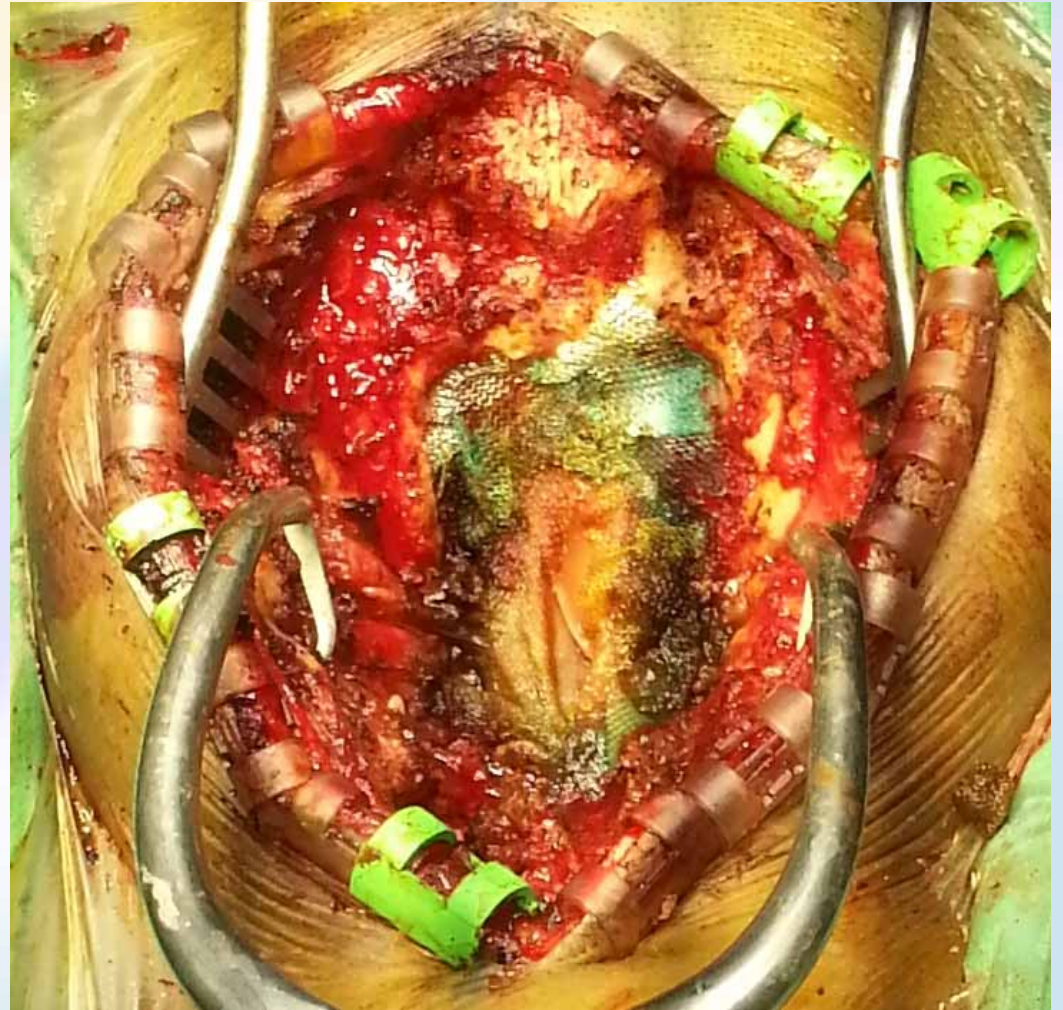
Suboccipital
craniectomy

Artificial Dura

8. Duroplasty (4)



A dural sealant applied to the suture line prevents CSF leak.



HEADACHES OF EXTRACRANIAL ORIGIN

WHIPLASH, TRACTION, SPRAIN, ROTATION, INJURIES

- Upper cervical nerves
- Trigeminal nerves
- Spinal accessory nerves
- Vertebral artery (haemorrhage in capsular ligaments of lateral joints)
- Vertebral arterial nerves
- Joints of "Von Luschka"

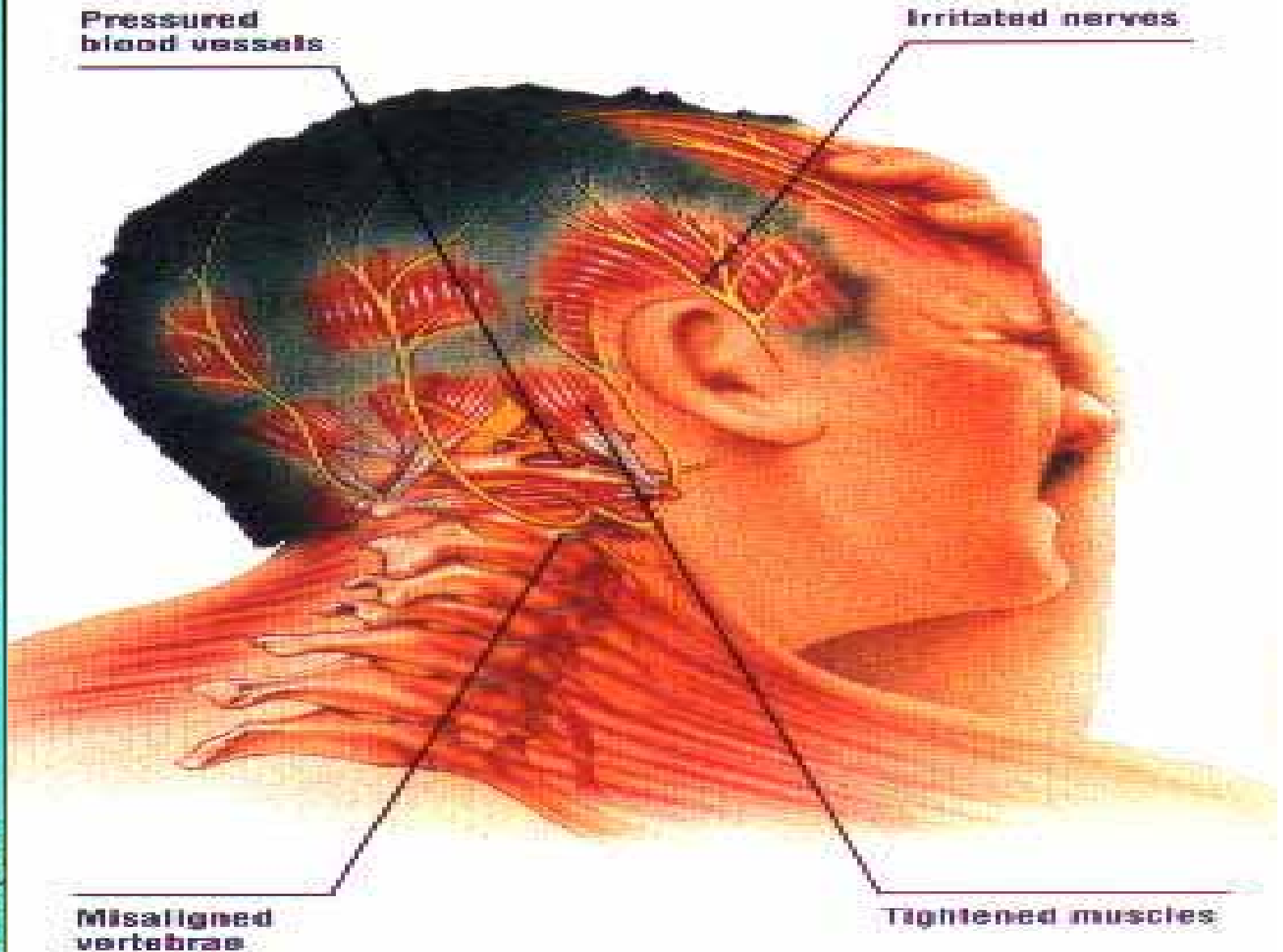
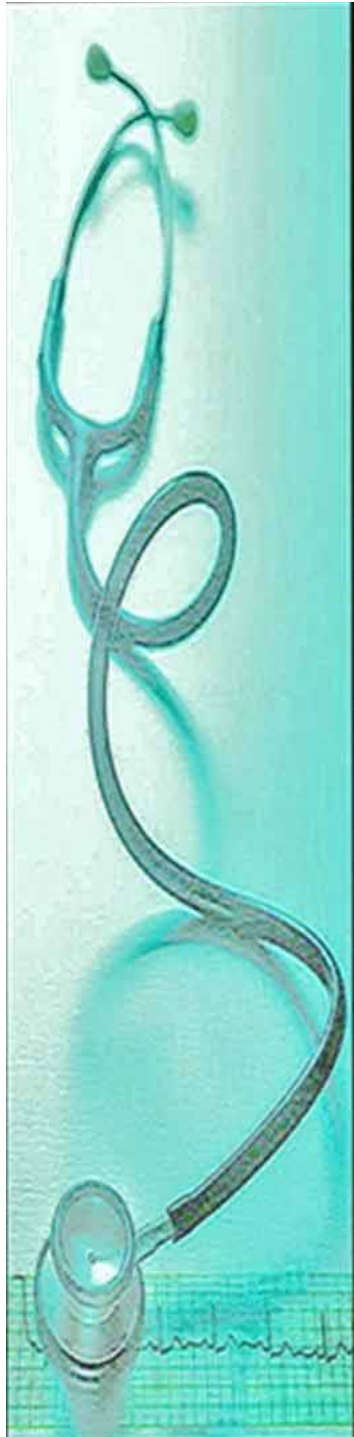
HEADACHE OF EXTRACRANIAL ORIGIN

TWO primary extracranial sources of these headaches

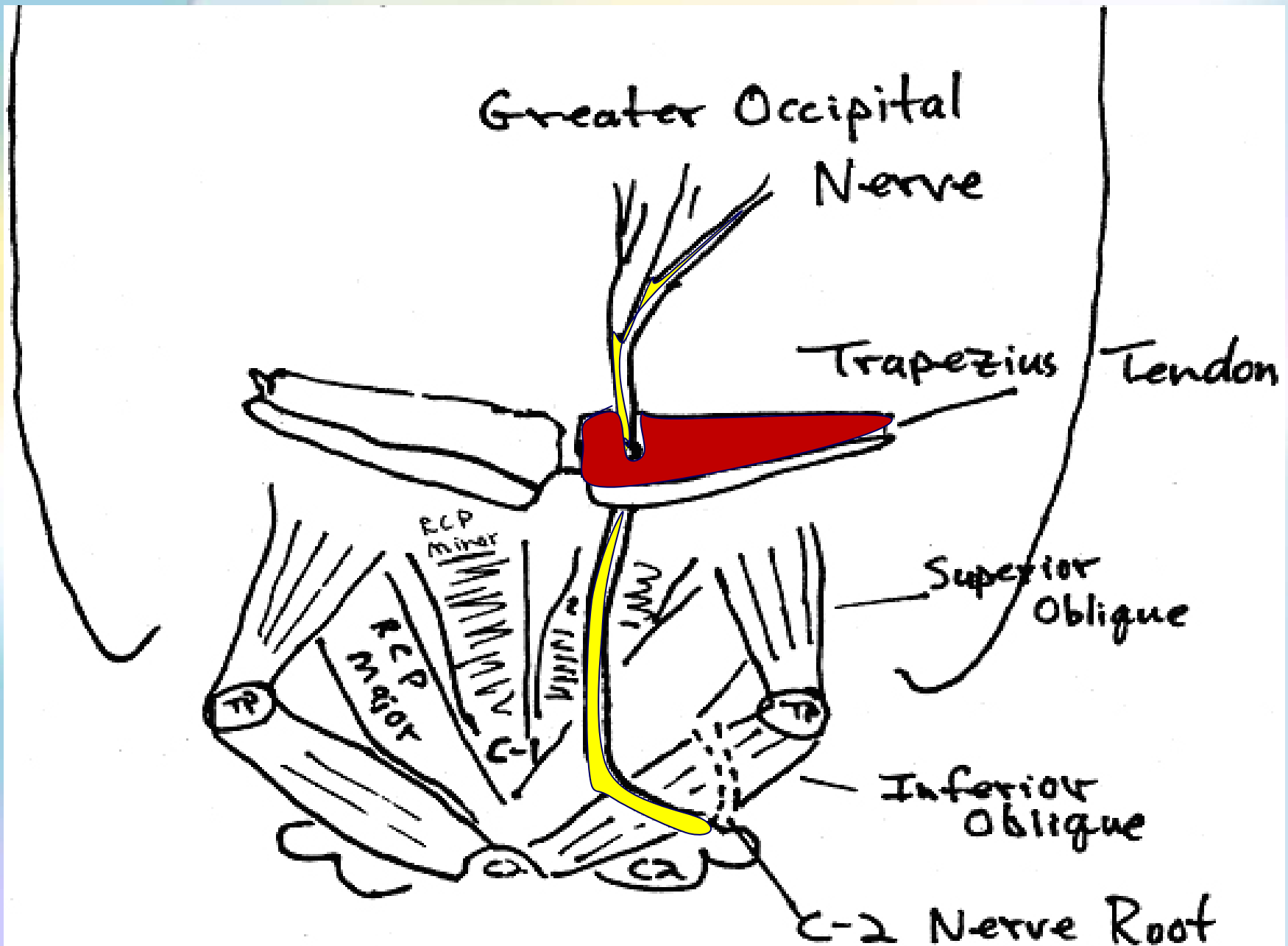
- Upper cervical spinal nerve roots
- Elements of the Trigeminal nerves

Craniocervical syndrome

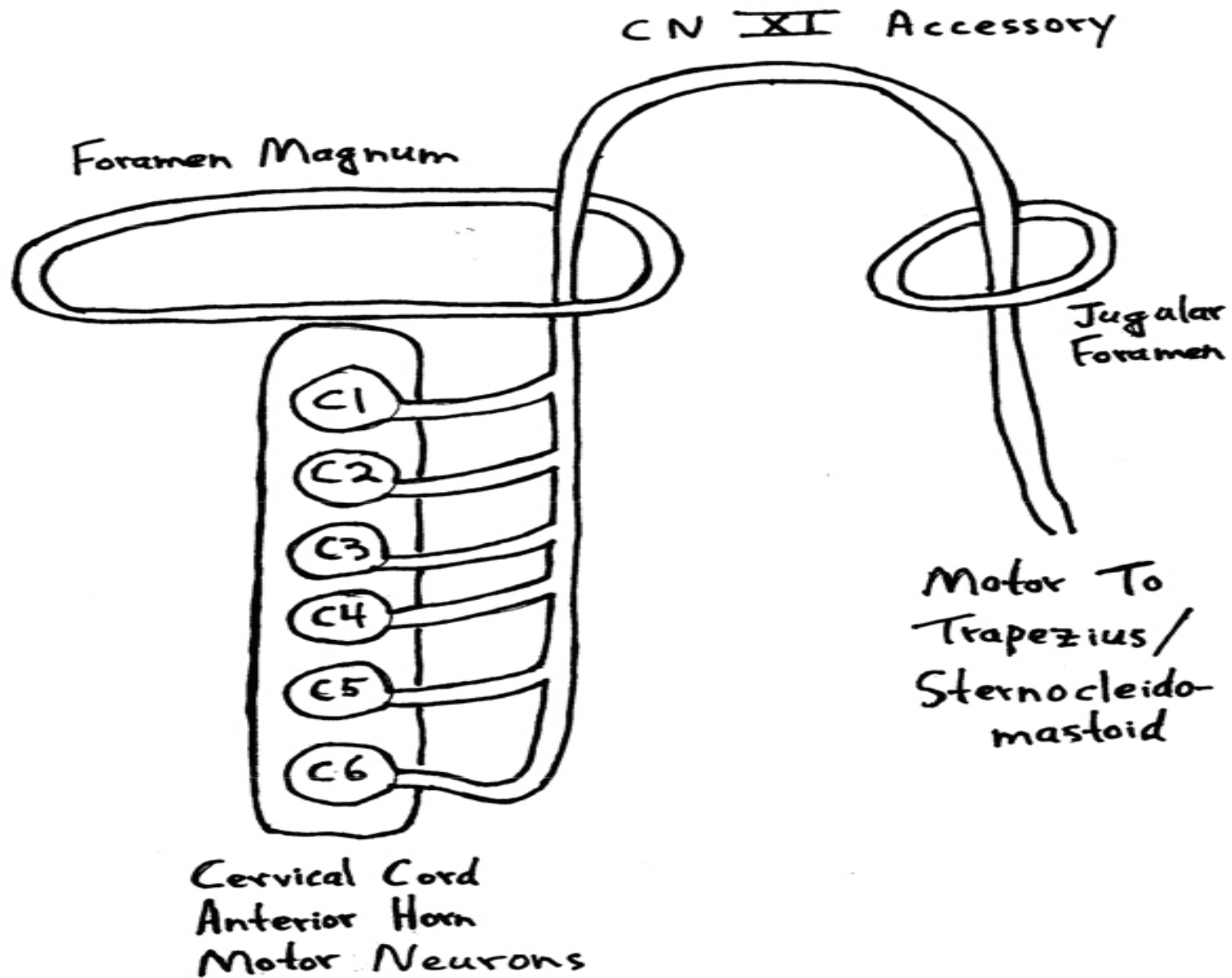
Acute Cervicogenic Pain



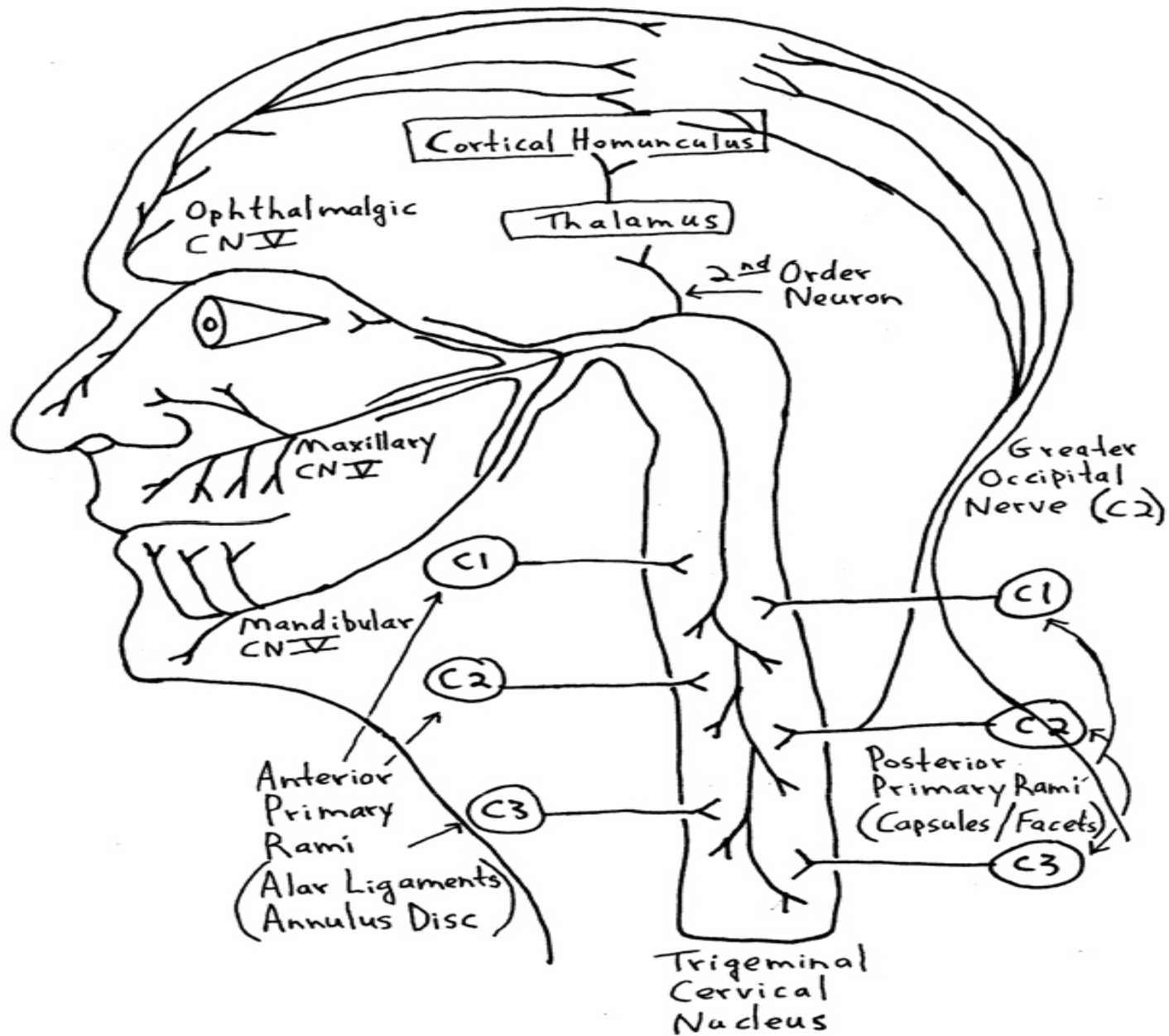
GREATER OCCIPITAL NERVE



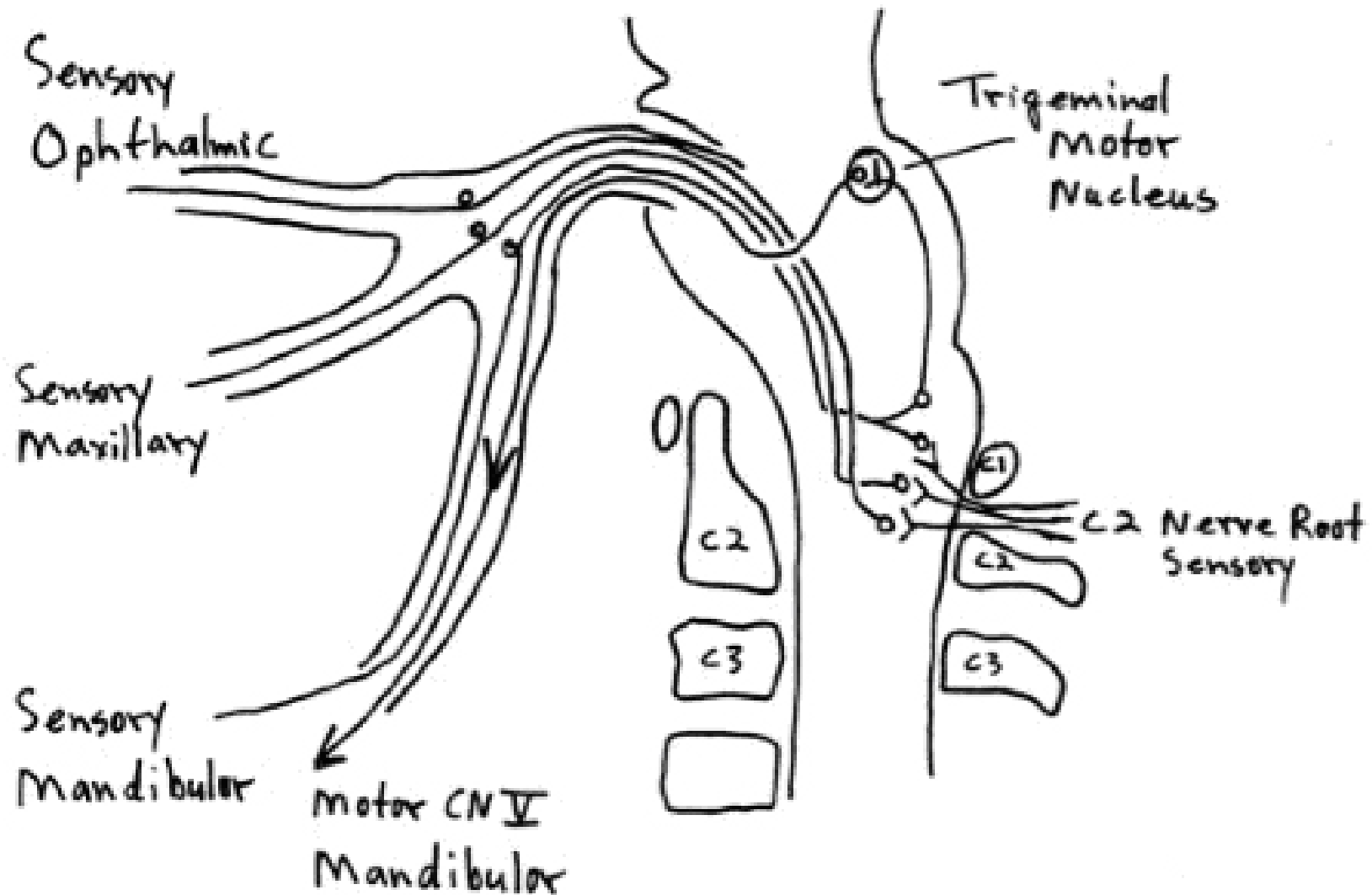
ACCESSORY NERVE AND SPINAL CORD ORIGIN



V C.N, C2 AND BRAIN STEM



TRIGEMINAL NERVE CONNECTION WITH C2



DIRECT TRAUMA TO HEAD

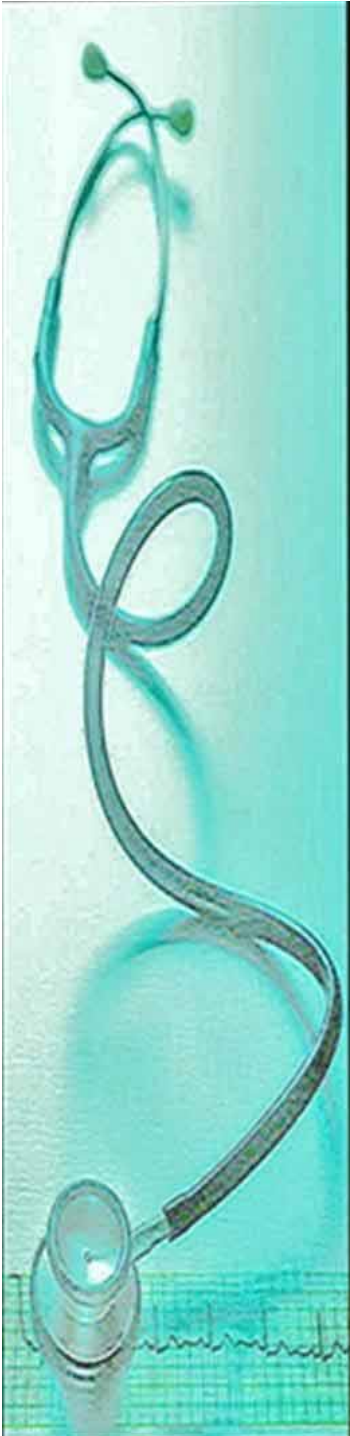
- Scalp contusion → Subcutaneous scar
→ bout of severe persistent headache
(Inervated by sensory branches of the greater occipital nerves C 2 and /or branches of cranial nerve V)
- Digital pressure on these scars → initiate the entire migraine like syndrome

Treatment is to treat the scar



*There are no bad patients
only
bad doctors!!*

Headache in Children





Headache in Children I

- Common causes are:-
 - Tumors
 - Hydrocephalus
- Subtentorial (60-70%)
 - Cerebellar Astrocytoma
 - Medulloblastoma
- Headache less common in children than adult
- Transitory occurs in the morning or wakes the child at night
- Posterior fossa tumors may cause irritation of the upper cervical posterior nerve root
- Neck stiffness and a persistent torcollis also point to a posterior fossa tumor

Headache in Children





Headache in Children II

- Vomiting

Vomiting is one of the most constant sign of raised ICP in children

- Tumors arising in the IV ventricle may present with vomiting as an early symptom due to irritation of the vomiting centre in medulla



FOCAL SIGNS

- Truncal and gait ataxia in → midline cerebellar involvement
- Horizontal gaze nystagmus → tumors around IV ventricle
- Bulbar dysfunction
- Cranial nerves palsies and long tracts signs suggestive of brain stem involvement



HEADACHE FEATURES

8 FEATURES OF HEADACHE WHICH NEED TO BE RECOGNISED

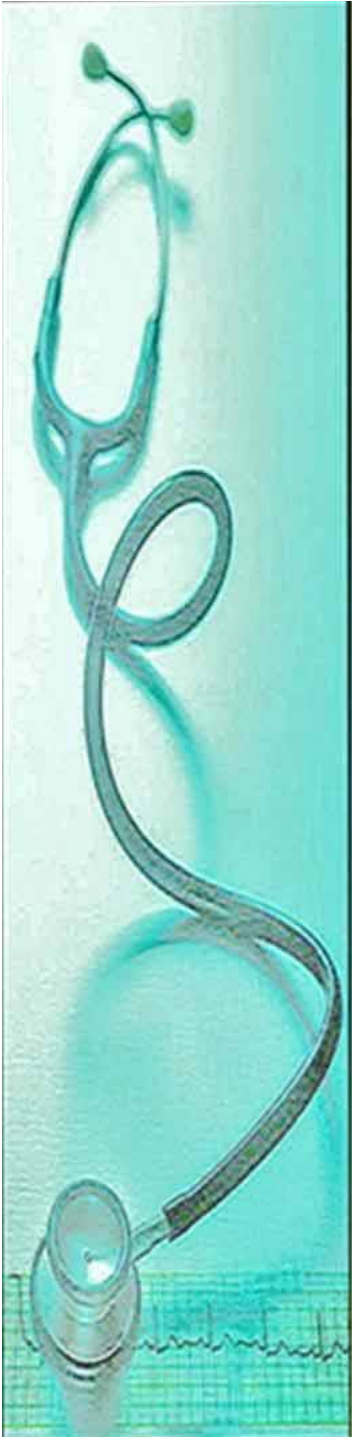
“AS RED FLAGS”

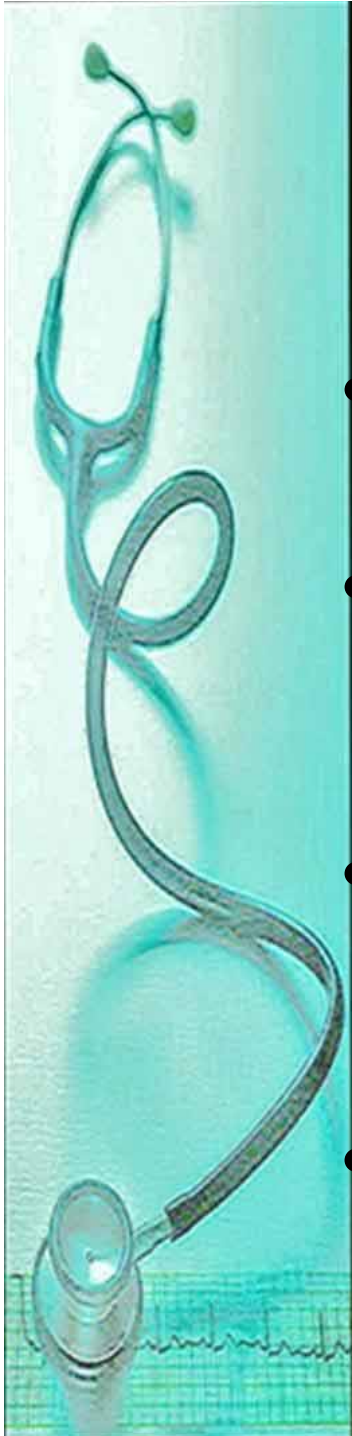
IF ANY OF THESE ARE PRESENT, THE PATIENT WILL REQUIRE NEURO IMAGING/ LUMBAR PUNCTURE

1. Sudden onset of headache (severest/persistent)
2. Worsening pattern headache
3. Papilloedema
4. Headache with systemic illness (fever and neck stiffness or cutaneous rash)
5. Headache triggered by cough , exertion or valsalva
6. Headache during pregnancy or post partum
7. New headache types in cancer or HIV infection
8. Focal neurological signs or symptoms- **diplopia,loss of vision, paralysis,motor or sensory seizures,speech, gait, personality or mental changes)**

In a Nutshell

- Headache is a common often banal complaint but only a minority is of neurosurgical importance
- Headache that has been present to the same degree day in and day out for months is very unlikely to be due to raised ICP
- Persistent headache of recent onset may indicate the presence of intracranial pathology
- The history given by the patient is of the greatest importance





In a Nutshell... (cntd)

- Raised ICP causes headache with distinguishing characteristics
- Early morning vomiting is common with raised ICP but vomiting may occur at any time of the day and is not coincidental with meals
- In children with open sutures headache with raised ICP may cease temporarily to recur with further tumor growth
- Headache other than entrapment of C2 nerve root rarely accompanies lower cervical nerves roots involvement

PITFALL

BE ALERT, BE AWARE

Follow the basic rule

- Detailed history
- Thorough good examination
- Time



Thank You!



<http://www.duiops.net/seresvivos>



When life becomes a headache...