Dizziness

Dr. Judit Boczán

Definition

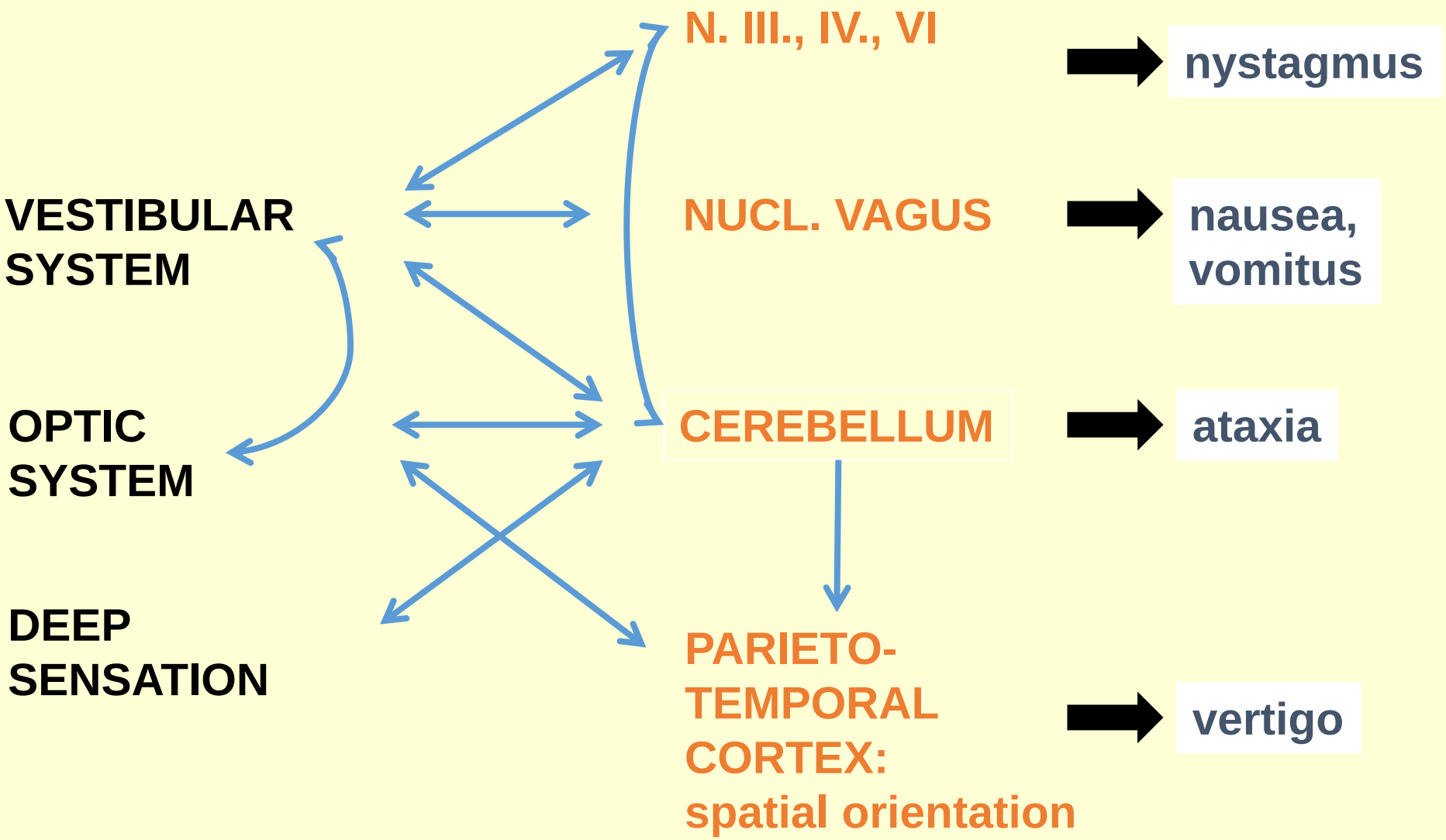
„Dizziness is a discrepancy between objective and subjective spatial relationships."

(Horányi)

It is an scenical sensation of movement of the body or the environment.

Diagnosis: Anamnesis, physical examination!!!

Experience of dizziness, symptoms



Types of dizziness

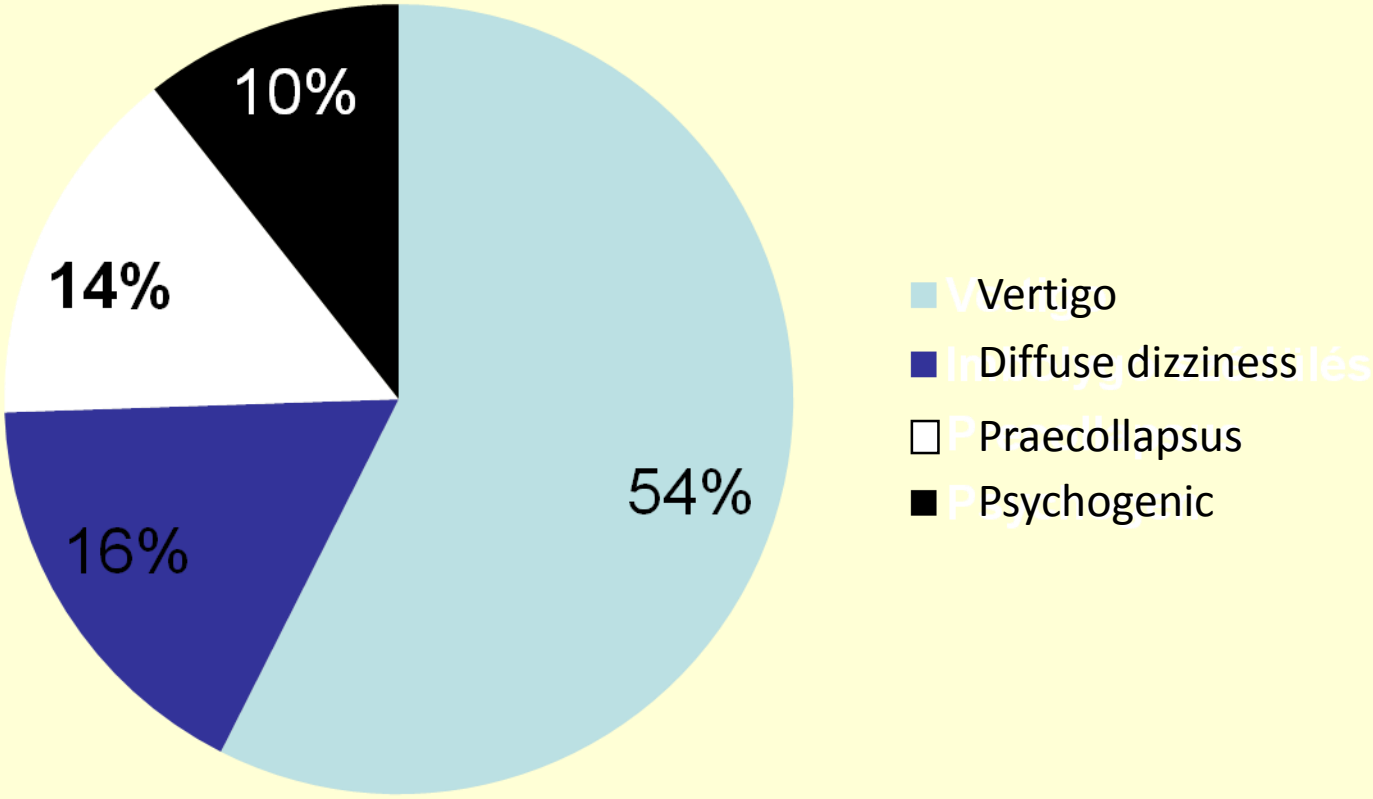
- *Vertigo*
  Sensation of rotation or tilt, nausea, associated with vegetative symptoms
  Eg.: vestibular neuronitis, BPPV

- *Diffuse dizziness* (postural imbalance, dysequilibrium, light-headedness)
  General imbalance, difficulty in standing or walking, sensation of levitation
  Eg.: polyneuropathy (deep sensory disturb.), cerebellar dis., Parkinsonism

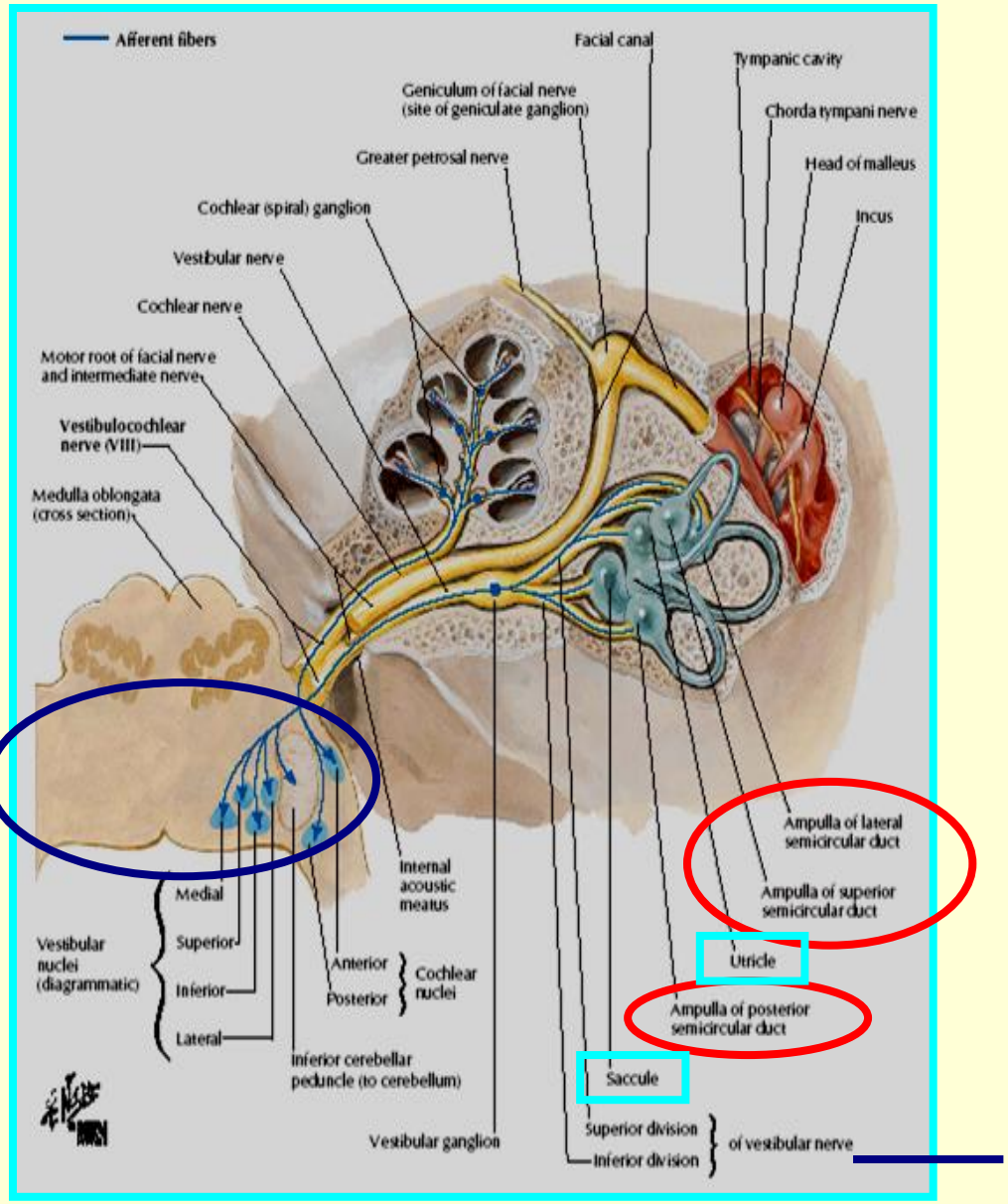
- *Praecollapsus*
  Feeling of general weakness, blurred vision, pallor
  Eg.: hypotension, arrhythmia, orthostatic hypotonia

- *Atypical, psychogenic dizziness* (numbness)
  Negative physical status, psychologic symptoms
  Eg.: anxiety, hyperventilation, panic attack, depression, agoraphobia, intoxication, drug effect

Types of dizziness



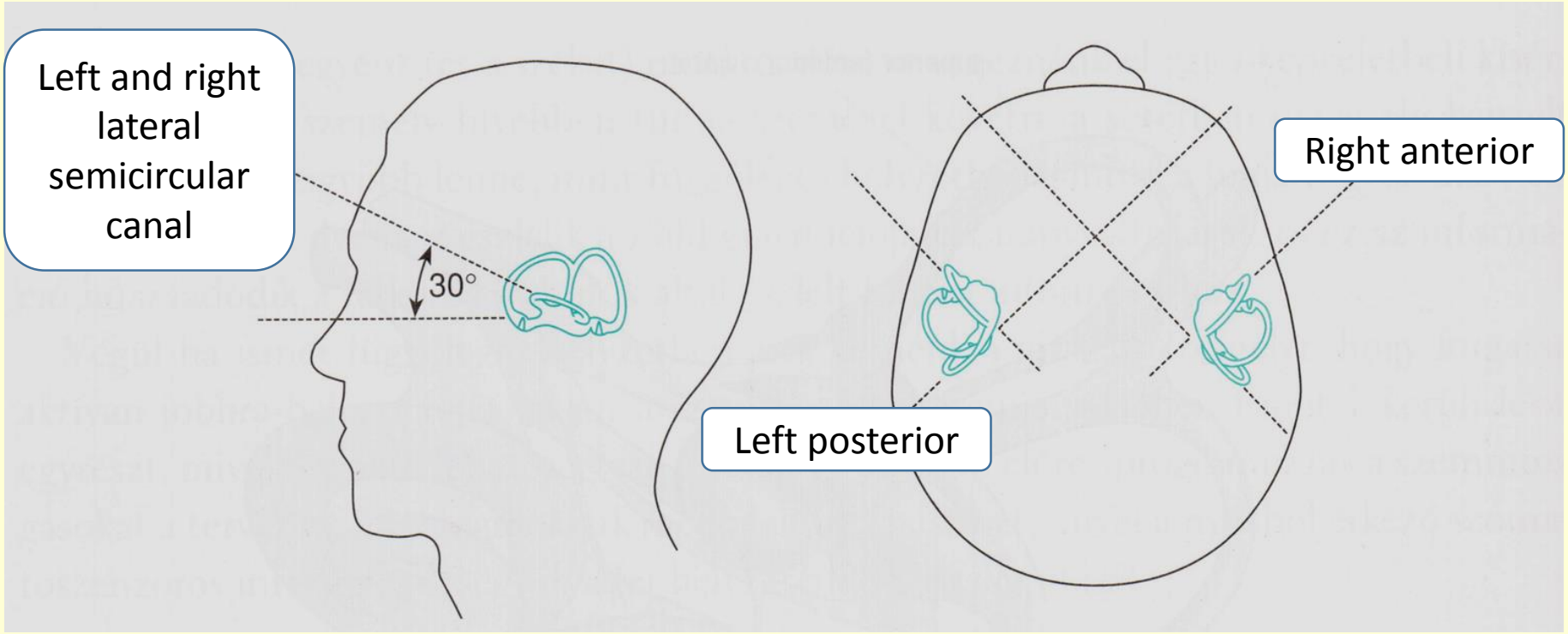
Anatomy



Quick
movement of the head,
Angular acceleration
Turning

Sensation of
static position
of the body,
horizontal,
vertical
linear
acceleration

Anatomy


Left and right lateral semicircular canal
30°
Right anterior
Left posterior

Anamnesis

- *Type of dizziness*

  rotatory / postural / atypical

- *Duration*

  seconds / minutes / hours / continuous / recurrent

- *Trigger*

  no / walking / rotation of the head / certain head positions / coughing / abdominal compression / loud sound / certain frequencies / certain situations in life

- *Concomitant sypmtoms*

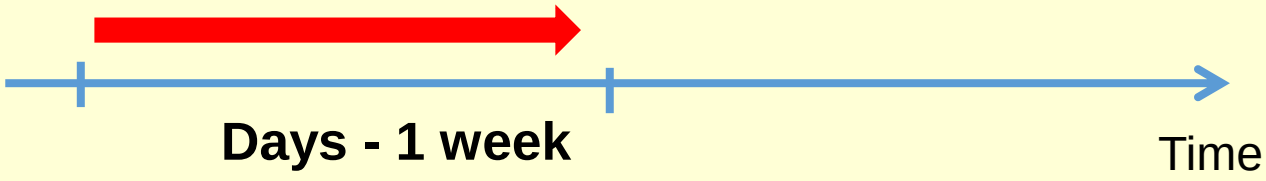
  hypacusis / tinnitus / double vision / ataxia / nystagmus / oscillopsia / brain stem or cerebellar signs / headache

Differential Diagnosis by Duration

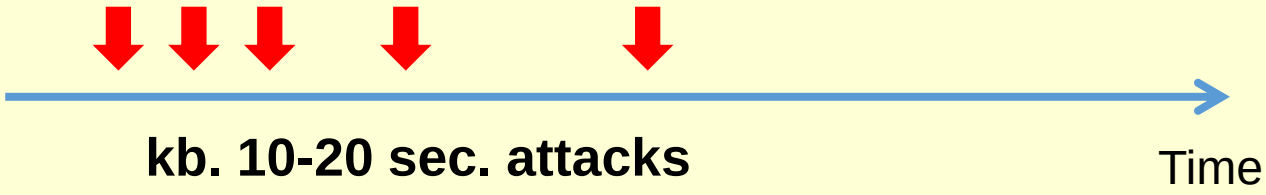
Time	Peripheral	Central
Seconds	BPPV	VBI-TIA, epilepsy aura
Minutes	perilymphatic fistula	VBI-TIA, migraine aura
Hours	Meniére's disease	basilar migraine
Days	Vestibular neuronitis, labyrinthitis	VB stroke
Weeks, months	acoustic neurinoma, ototoxicity	Multiple sclerosis, cerebellar degenerations

Peripheral vestibular damage

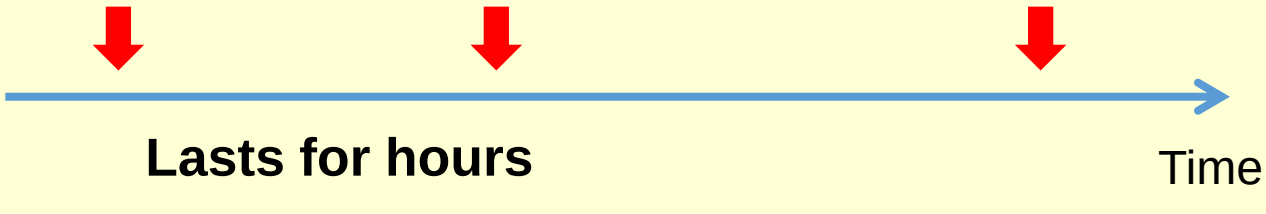
Vestibular neuronitis:



Benign Positional Paroxysmal Vertigo:

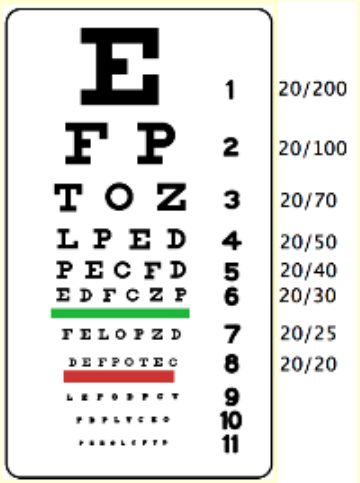


Meniére's syndrome:

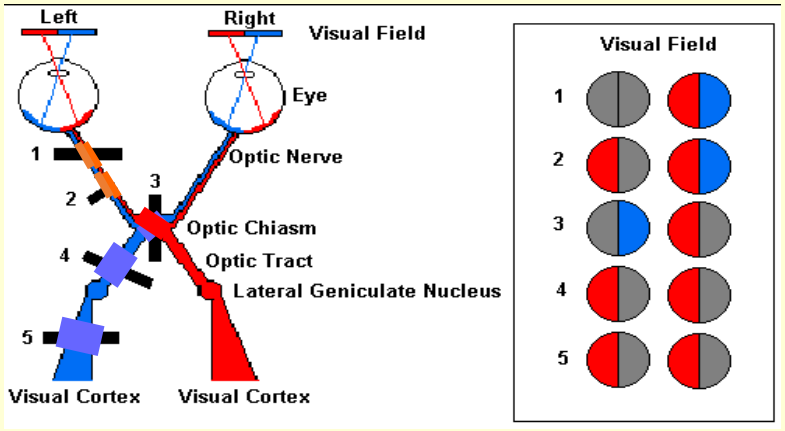


Physical examination

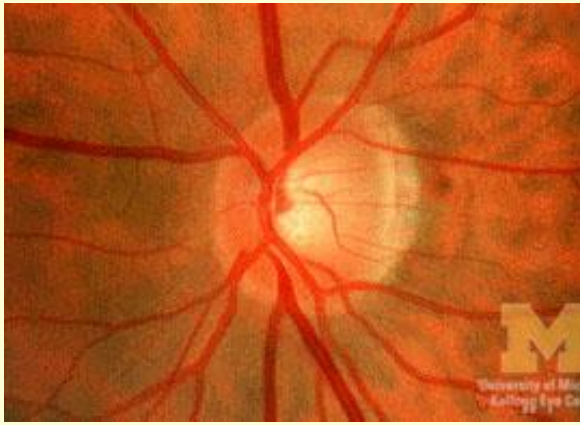
Optic nerve (I.)



Visus



Visual field



Fundus

Vestibulocochlear nerve (VIII.)

Harmonic vestibular symptoms

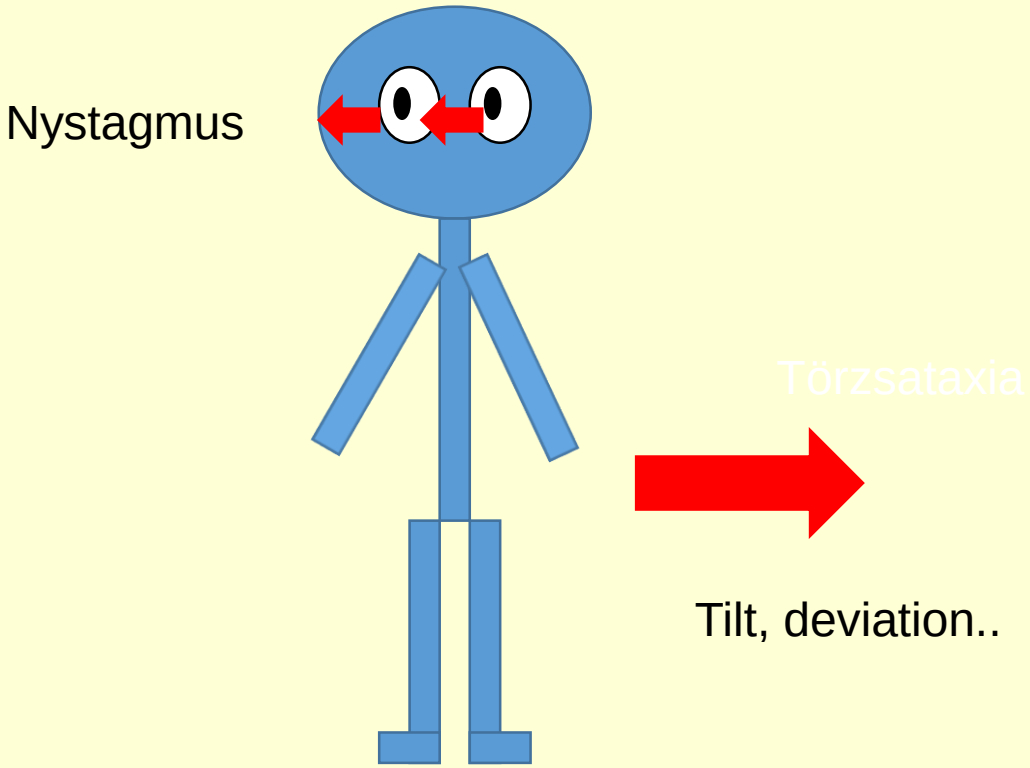
Nystagmus

Romberg position

Blind walking

Utenberger test

Bárány test



Vestibulocochlear nerve (VIII.)

- *Halmágyi-Curthoys maneuver (head impulse test)*
  - Vestibulo - Ocular Reflex (VOR)
  - One sided labyrinth laesion ⟹ catch-up saccad
- *Dix-Hallpike maneuver*
  - positional nystagmus, BPPV

Vestibulocochlear nerve (VIII.)

- *Labyrinth stimulation tests*
  - Head shaking (30 sec) – one sided lesion
  - Caloric stimulation – gold standard in one sided lesion
  - Stimulation by rotation

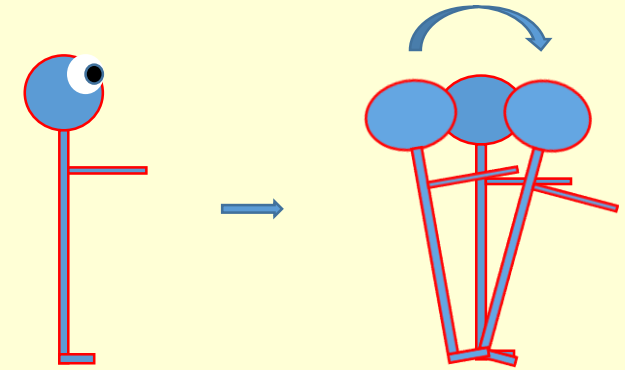
Somatosensory system

Examination of deep sensation

Vibration

Joint position

Romberg: sensory truncal ataxia

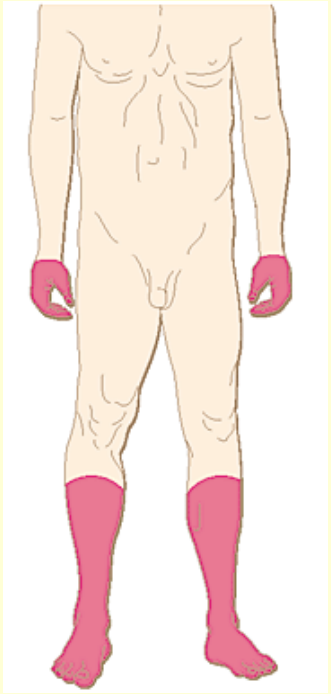


EYES OPEN……..CLOSED

NYITOTT SZEMMEL

Damage of the somatosensory system

Polyneuropathy

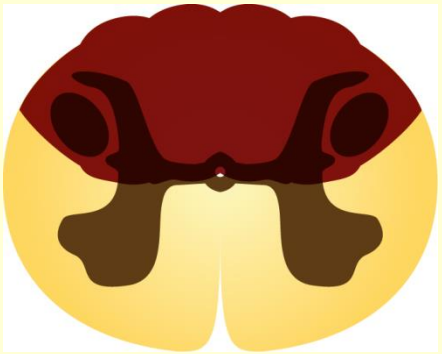


Funicular myelosis

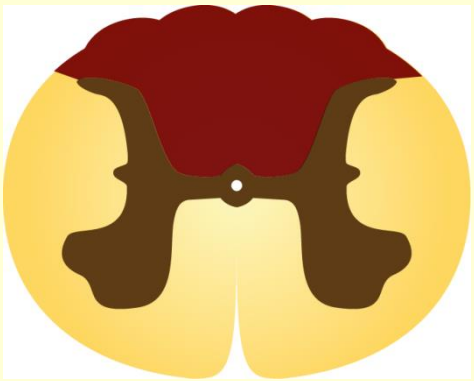
Combined degeneration

of the spinal cord

Vitamin B12 deficiency



Tabes dorsalis



Most frequent causes of dizziness

• BPPV *(otolith)*	18,3%
• phobic postural vertigo (PPV)	15,9%
• Central origin	13,5 %
• Vestibular / basilar migraine	9,6 %
• Vestibular neuronitis *(viral)*	7,9%
• Menière's disease *(hydrops)*	7,8%
• Bilateral vestibulopathy	3,6%
• Psychogenic vertigo	3,6%
• Vestibular paroxysmia *(neurovasc. compr.)*	2,9 %
• Perilymphatic fistula *(eg. posttraumatic)*	0,4%
• Other	12,3%
• Unknown cause	4,2%

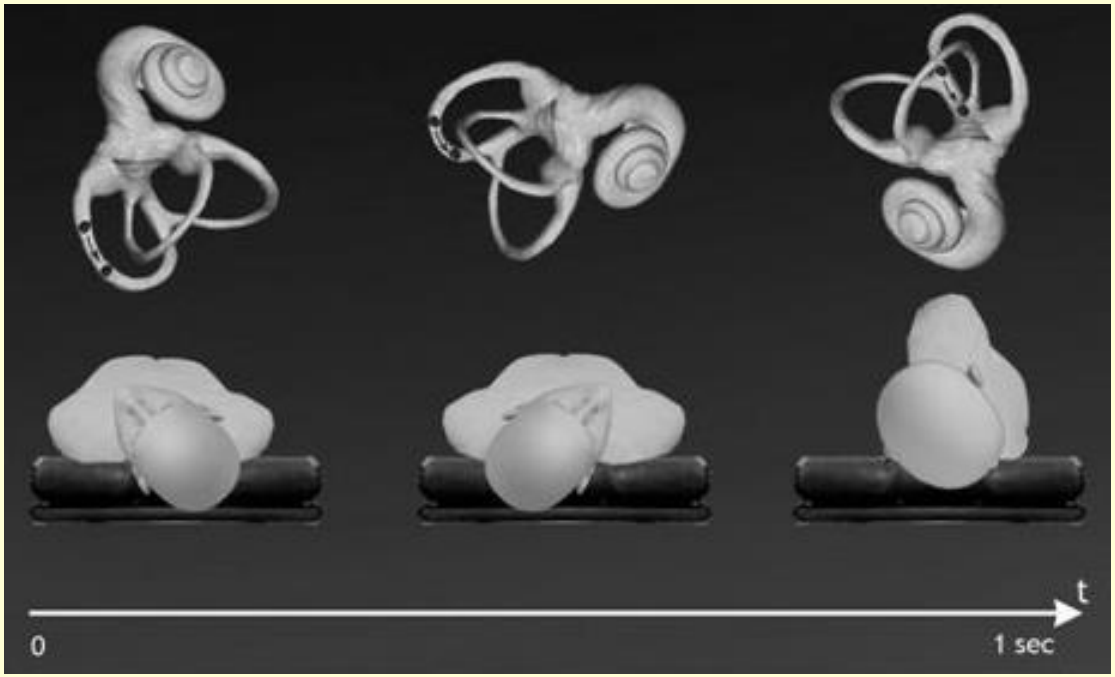
Dizziness of peripheral origine

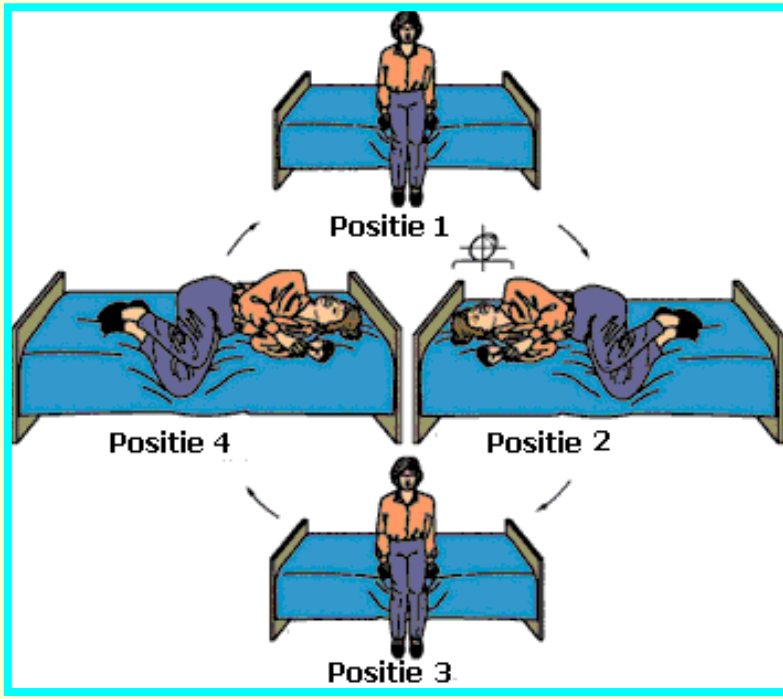
Vertigo

Benign Paroxysmal Positional Vertigo (BPPV) – 18%

- Bárány 1921
- At least 1 attack in 1/3 of people above 70 year of age
- Lasts until maximum 30-60 seconds
- Certain head position provokes (always)
- Nystagmus (app. 5 sec) occurs after latency, constant direction, crescendo- decrescendo like
- Cause: canalolithiasis, posterior semicircular canal in most cases, 10% - horizontal, rarely - anterior
- No spontaneous nystagmus, acoustic impairment, caloric discrepancy
- 90% idiopathic. Also: posttraumatic, after neuronitis or long lasting bedridden periods.
- 10-20% on both sides

BPPV therapy





Epley

Brandt-Daroff

Vestibular Neuronitis – 8%

- Viral infection upon or before the symptoms
- Rotatory intense vertigo, vegetative signs
- Harmonic vestibular symptoms
- Recovery after weeks - months (via central compensation)
- Full vestibular recovery only in 40%!!
- BPPV or PPV might occure later

Therapy:

- Vestibular supressants: in case of vomitus!
- Iv. fluid supplementation, antiemetics
- Metilprednisolon: start within 3 days, for about 2 weeks, *marked progression in residual vestibular function*
- Vestibular rehabilitation practices to improve central compensation!

Meniére's syndrome – 8%

Pathophysiology:

- Endolymphatic hydrops (labyrinth)
- Mixture of endo- és perilympha (depolarization ⟶ hyperpolarization)

Typical attack:

- Harmonic symptoms, symptoms change direction during the attack
- *tinnitus, hypacusis, sensation of congestion in the ear*
- Lasts for hours (> 20 min), max. 12 hour, extraordinary for 24 hours!
- Excitation at start, then vestibular arrest
- Progressive hearing and *vestibular dysfunction*
- Starts in the 4th-6th decade, males are more affected

Therapy:

- Vestibular suppressants in the acute stage
- Prophylaxis: Betahistin 3 x 40-48 mg for 6-12 months!
- Hydrochlorothiazid, triamterene - when needed
- Rarely intratympanal **gentamycin**. Surgery is not effective.

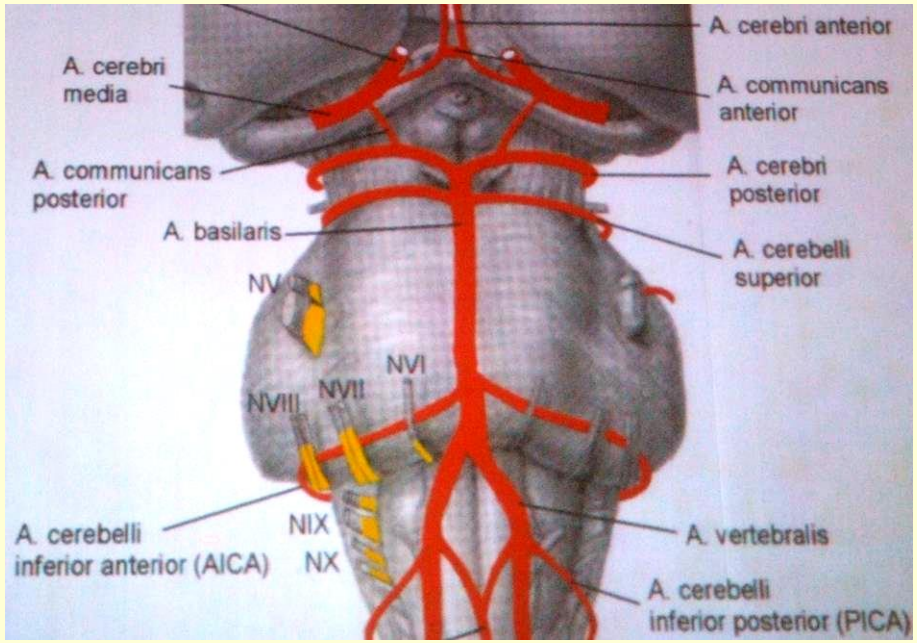
Vestibular paroxysmia – 3%

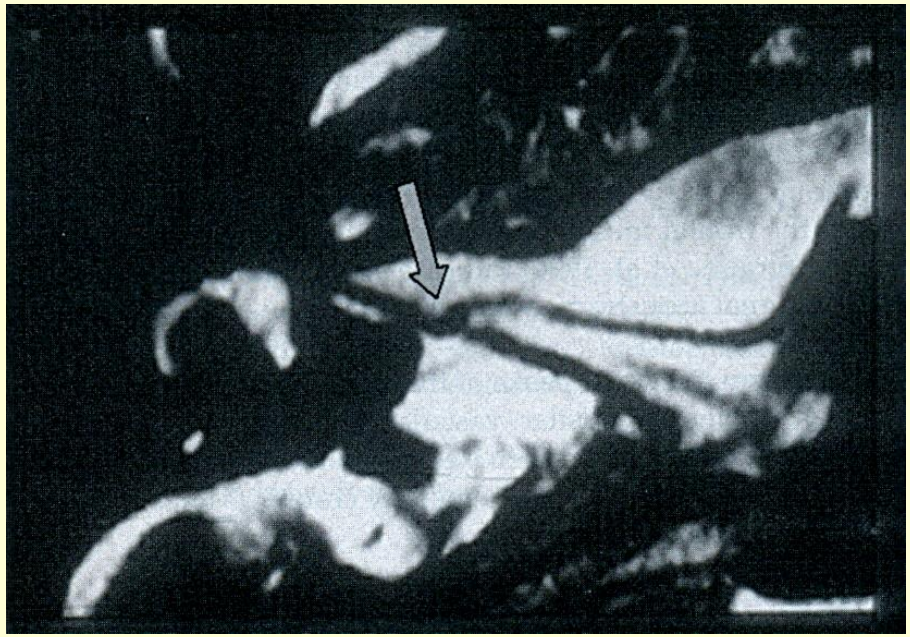
- Short vertigo or postural dizziness attacks lasting for seconds, maximum minutes with intense rotatory nystagmus
- Tinnitus, hypacusis rarely occur
- Vestibular and cochlear deficit might occur
- *Trigger:* certain head position, sometimes hyperventilation
- Carbamazepine is effective
- No brain stem symptom
- Sometimes signs of facial nerve excitation during the attack
- More frequent in males, in 5th-7th decade

Vestibular paroxysmia

Etiology*:*

- neurovascular cross-compression
- segmental, demyelinisation caused by pressure, spontaneous excitations
- AICA causes most frequently, but exists in healthy individuals, too
- arachnoidal cyst, aneurysma, vascular malformation





Vestibular paroxysmia

Therapy:

carbamazepine 200-600 mg/die

- Quickly effective, diagnostic
- oxcarbezepine, gabapentin, valproic acid, phenytoin

- Surgical decompression should be avoided
- hypacusis, stroke, which side?, successful only in 50-60%

Other peripheral causes

- Bilateral vestibulopathia
- Labirynthitis (with the cochlea involved)
- Commotio labyrinthi, pyramis fracture
- Ictus cochlearis (a. labyrinthi)
- Alternobaric vertigo
- Posttraumatic otolith vertigo
- Herpes zoster oticus
- Vestibulotoxic drugs

  aminoglikosides, salicylic acid, antiepileptics

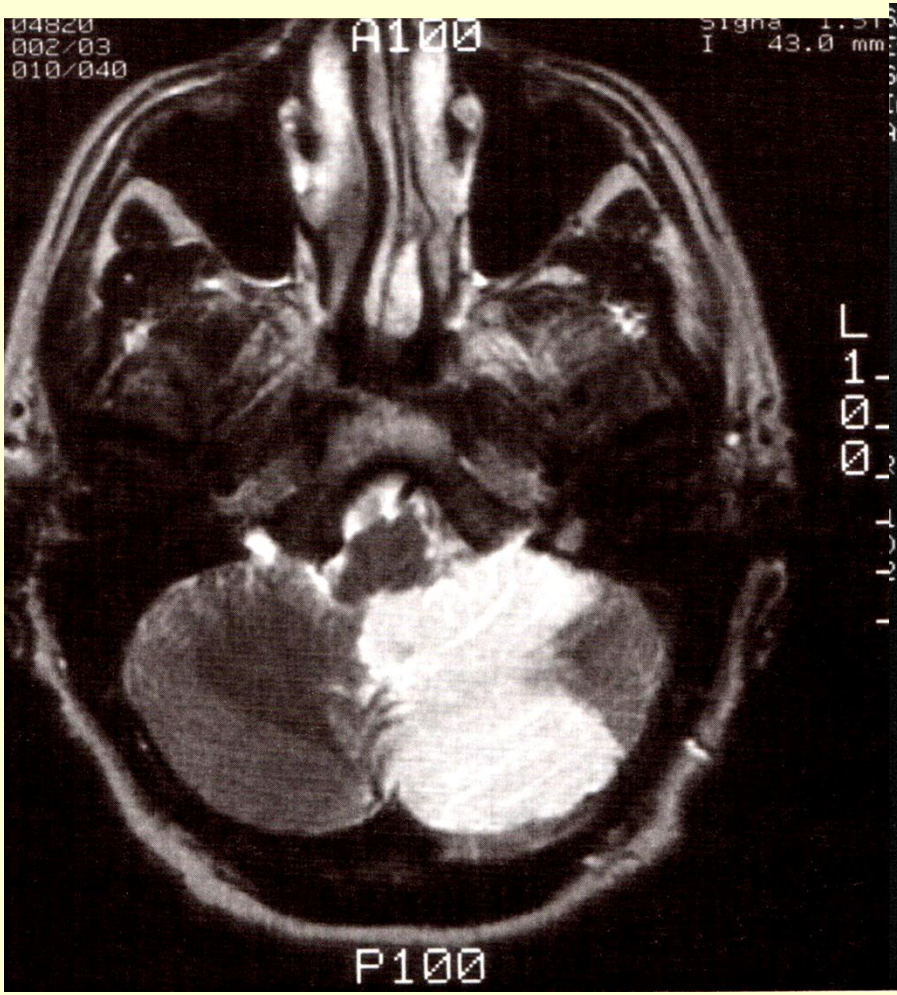
Dizziness of Central Origin

Most frequent central causes

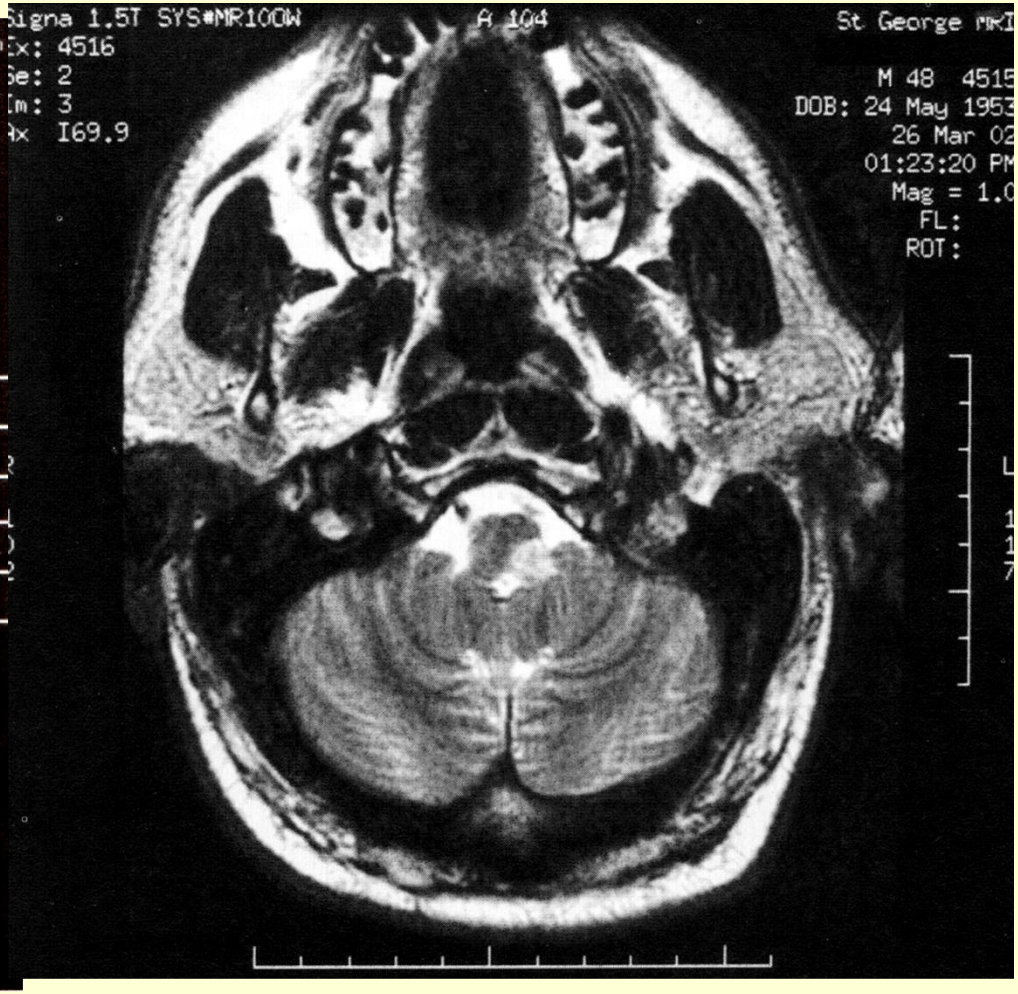
- VBI
- Multiple Sclerosis
- Basilar / vestibular migraine
- Tumors of the posterior fossa
- Arnold - Chiari malformation
- Cerebellar atrophy, degeneration, PSP
- Temporal epilepsy

Vertebrobasilar insufficiency

PICA területi ischaemia



Wallenberg syndroma



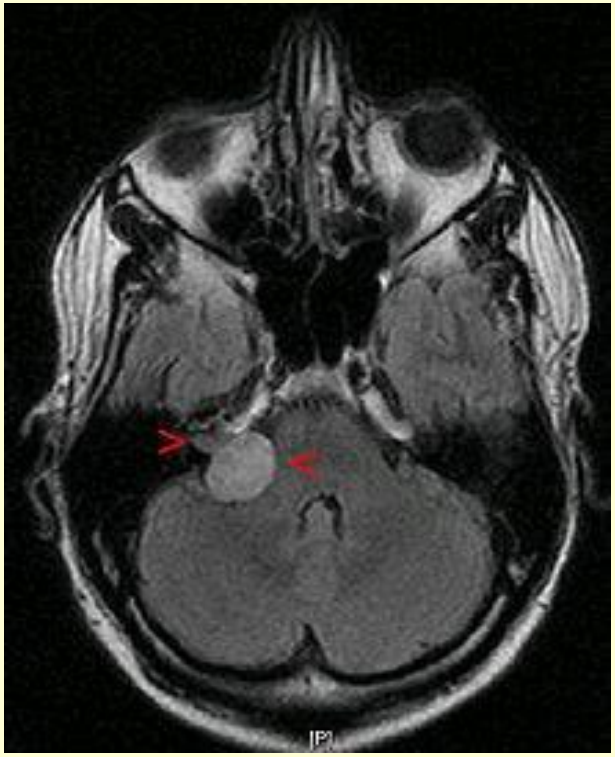
Basilar / vestibular migraine – 10%

- *Recurrent attacks:*
  - vertigo, ataxia, visual disturbance, other brainstem signs
  - occipital headache, nausea, vomitus
  - disturbed consciousness, slow psychomotility, changes in mood

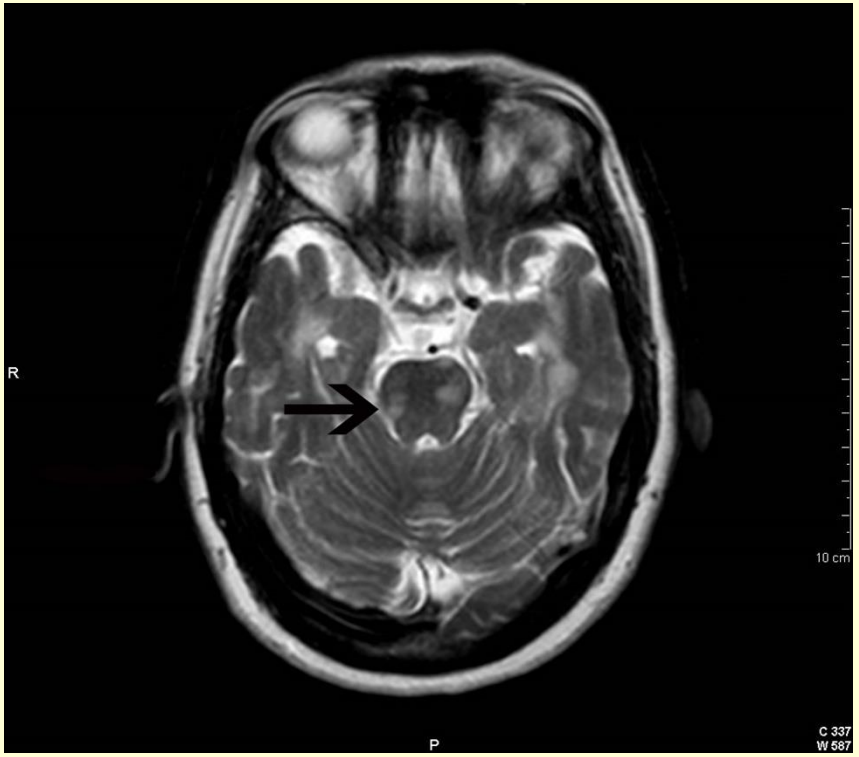
- *Vertigo or hearing loss alone:*
  - vestibular migraine
  - 75% of cases, difficult to recognize!
- *Duration:* seconds – days
- *Age:*
  - Any time, mainly in the 3th-6th decade
  - 2-3 times more frequent in females

Basilar / vestibular migraine

- *Therapy:*
  - Same as at migraine with aura
  - antiemetics, NSAID
  - triptans: carefully due to risk for ischemic stroke!!
  - Triptans are effective for vertigo attacks
  - prophylaxis: beta blockers, valproic acid

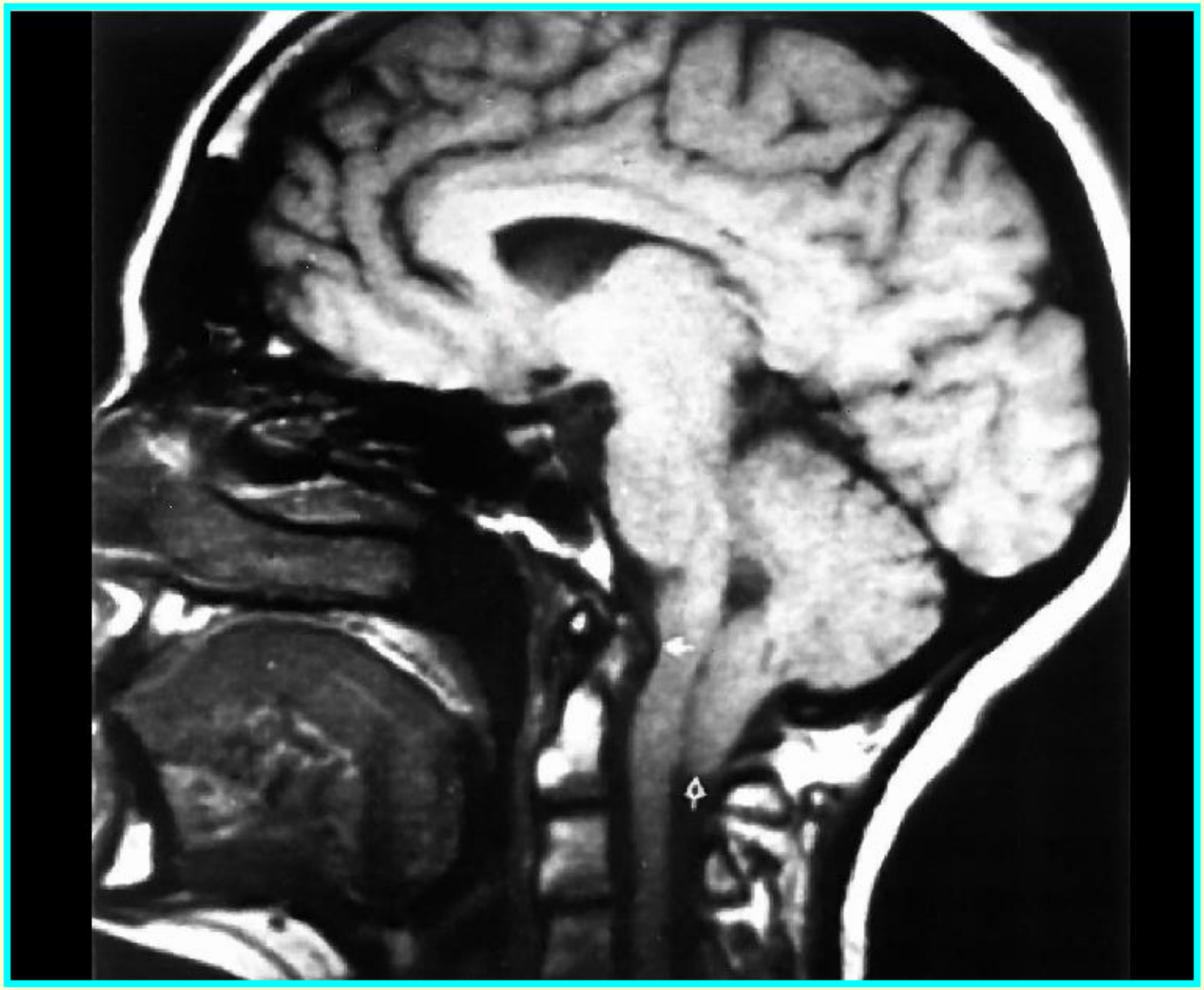


Posterior fossa tumor



Multiple sclerosis

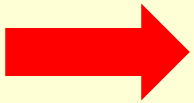
Arnold-Chiari malformation



General causes

General causes

- Hypertonia
- Orthostatic hypotonia
- Carotis sinus hyperaesthesia, vasovagals attacks
- Arrhythmias
- Hyperventilation syndrome
- Hypo – hyperglycaemia
- Aortic valve, mitral stenosis
- AMI
- Obstructive cardiomyopathy
- Aorta dissection
- Pulmonary embolism
- Heart failure
- Anaemia
- Hyperviscosity syndrome
- Addison’s disease
- Hyponatraemia
- Intoxication



Disturbed brain circulation

Psychogenic dizziness

PPV - Phobic Postural Vertigo – 16%

- 2nd most frequent cause of dizziness
- *Age:* most frequent in the 2nd and 5th decade
- Imbalance feeling at standing and walking
- Attacks of fear-of-falling, lurches, with anxiety, vegetative signs
- Little alkohol, sport makes the symtoms better
- At certain situations (eg. crowd, bridge, driving)
- Avoidance behavior

PPV - Phobic Postural Vertigo

- *Onset:* frequently after vestibular neuronitis, BPPV or after a psychosocial stress situation
- ***Physical examination: negative!***
- It is a sub-threshold agoraphobia and/or panic
- *Therapy:*
  - *Inform the patient, desensitisation, behavior therapy*
  - antidepressants (SSRI, TCA)

Summary - Therapy of dizziness

Symptomatic, in acute vestibular episode

- vestibular supressants
- antiemetics

Balance practices, vestibular rehabilitation

- To improve central compensation

Surgical (rarely)

- tumors, cavernoma
- neurovascular compression
- perilymphatic fistula
- rarely Meniére's, BPPV

Psychological, psychiatric

- PPV, acrophobia

Symptomatic treatment

Vestibular supressants:

- benzodiazepin
- dimenhydrinat (Daedalon); promethazin (Pipolphen)
- hydroxyzin (Atarax)
- cinnarizin (Stugeron); flunarizin (Sibelium)

Antiemetics:

- Anti-dopaminerg: thiethylperazin (Torecan), haloperidol (Haloperidol), sulpirid (Depral), metoclopramide (Cerucal), domperidon (Motilium)

- Anticholinerg-antihistamin: dimenhydrinat (Daedalon), promethazine (Pipolphen), ondansetron (Zofran)