

## Non-otologic Dizziness

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## Dizziness is an imprecise term

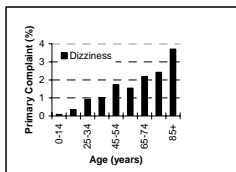
- Vertigo (sensation of motion)
- Lightheaded
- Ataxia
- Confusion



Because “Dizziness” is an imprecise term, a major role of the clinician is to sort patients

## Dizziness is VERY Common

- Dizziness is the chief complaint in 2.5% of all primary care visits.
- 30% lifetime prevalence of dizziness requiring medical attention
- Older people have more dizzy problems



Estimated percentage of ambulatory care patients in whom dizziness was a primary complaint (Sloane, et. al., 1989).

## Diagnostic Categories

<u>Category</u>	<u>Example</u>
■ Otological	■ Meniere’s disease
■ Neurological	■ Migraine
■ Medical	■ Low BP
■ Psychological	■ Anxiety
■ Undiagnosed	■ Post-traumatic vertigo

## Question 1

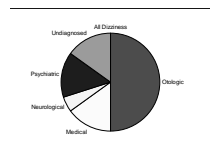
- Which category is associated with the most dizziness ?
  1. Inner ear disorders
  2. CNS problems (e.g. Stroke)
  3. Blood pressure
  4. Psychological problems
  5. Undiagnosed

## Answer 1

- It depends on your referral base
  1. Inner ear disorders (about 50% of ENT, 30% in general)
  2. CNS (about 25% of neurology, 5% everyone else)
  3. Blood pressure (30% of family practice, 5% everyone else)
  4. Psychological problems (15% to 50%)
  5. Undiagnosed (up to 50%)

## Diagnostic Categories – non-otologic dizziness

1. Neurological (i.e. posterior fossa)
2. Medical (i.e. low blood pressure)
3. Psychological (anxiety, malingering)
4. Undiagnosed

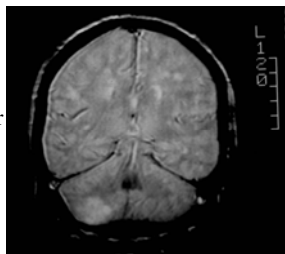


## Causes of neurological dizziness 15-30% subspecialty, 5% ER

- 35% Stroke and TIA
- 16% Migraine
- Various Ataxias
- Seizures
- Multiple Sclerosis
- Tumors
- Head Trauma
- CSF pressure abnormalities - -CSF leak, NPH

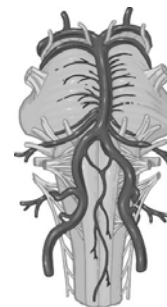
## Posterior Fossa stroke

- 50 year old doctor developed vertigo and unsteadiness
- Continued to operate for a week before seeking medical attention but wife wouldn't let him drive.
- PICA stroke seen on MRI



## Common Strokes with Dizziness

- PICA (lateral medullary and cerebellum) – palatal weakness
- AICA (pons and cerebellum) – hearing loss
- SCA (cerebellar)



## Posterior Inferior Cerebellar Artery (PICA) Wallenberg's Syndrome Lateral Medullary Syndrome

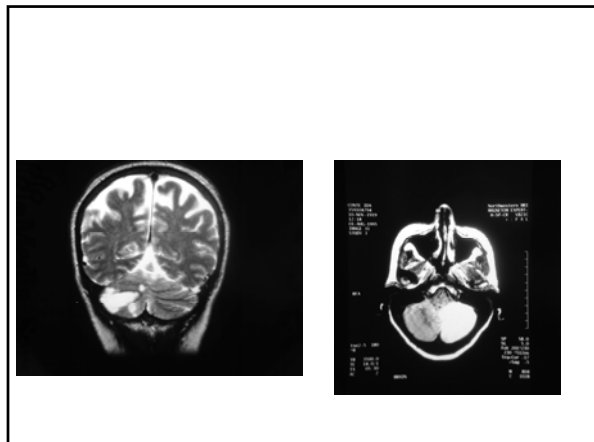
- Adolf Wallenberg

German internist, born November 10, 1862, Preuss.-Stargard. died 1949.



## Case (IC)

- Onset of dizziness 1 week ago
- Unable to walk
- Diabetes and new onset a-fib
- Exam:
  - Ataxic but intact VOR
  - No spontaneous nystagmus
  - Neuropathy



## Carotid disease does not cause dizziness

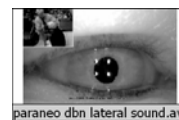
- Carotids supply anterior brain. No dizziness circuitry there. Carotid disease causes weakness/numbness/speech disturbance
- Carotid endarterectomy rarely helps dizziness

## Paraneoplastic syndromes -- case

- 35 year old woman admitted to hospital because very unsteady – poor coordination
- Many tests were done without a diagnosis. Nobody did a breast exam.
- 1 year later noticed a large breast lump
- Breast cancer removed – but patient left with severe cerebellar syndrome

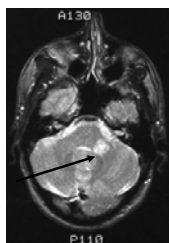
## Paraneoplastic syndromes

- Remote effect of cancer
- Associated with lung and breast cancer
- Vestibulo-cerebellar syndrome – dominated by
  - Ataxia
  - Nystagmus (particularly downbeating)
- May be related to autoantibodies



## Multiple Sclerosis (MS)

- No single pattern
- Multiple lesions distributed in time and space



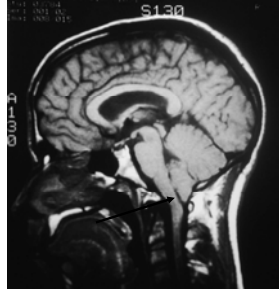
## Multiple Sclerosis (MS)

- INO is common in MS



## Chiari Malformation: Case

- Dock worker in Baltimore came in because gets dizzy when lifts heavy boxes
- Examination: unsteady, downbeating nystagmus.
- MRI showed cerebellar tonsils lower than normal.

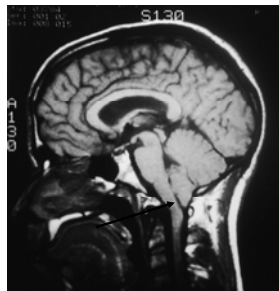


## Downbeating Nystagmus may be clue to underlying cerebellar degeneration or Chiari



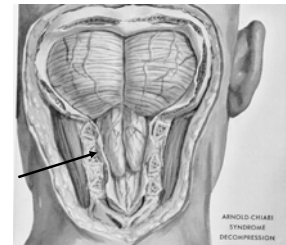
## Chiari Malformation

- Cerebellar tonsils herniate downward
- Adult onset
- Straining or coughing produces headache or fainting
- Unsteadiness
- Nystagmus



## Chiari Malformation Treatment: Suboccipital decompression

Arrow points to tonsils. This surgical exposure is larger than would be used in real operation



Netter

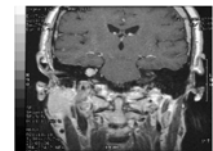
## Non-otologic ataxias – all of neurology ?

- Cerebellar
- Basal Ganglia
- Hydrocephalus
- Sensory loss (B12)
- Periventricular WM lesions
- CSF leak
- Drugs (e.g. anticonvulsants)
- Degenerations (e.g. PSP, Palatal myoclonus)

## Brain Tumors Causing Dizziness

We worry a lot about these rare disorders

- Acoustic Neuroma (rare)
- Meningioma
- Cerebellar astrocytoma
- Cerebellar hemangioblastoma

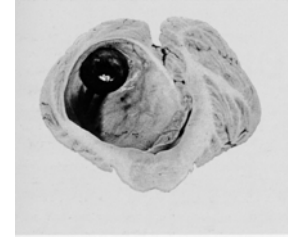


## Cerebellar Astrocytoma Case

- Young woman in residency training
- Developed a headache and went to ER. In ER a CT scan was done.
- A large tumor was found occupying most of right side of cerebellum.
- Tumor was removed – after operation patient developed incoordination R side. Over 6 months, has improved so much can return to training program.

## Cerebellar Astrocytoma Cerebellar hemisphere syndrome

- Largely in children
- Slowly growing tumor
- Resection often cures



CYSTIC CEREBELLAR ASTROCYTOMA

Rubinstein L, Tumors of the Central Nervous System

This child is holding onto the bed rail due to ataxia from a medulloblastoma

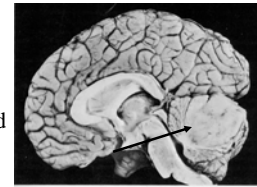


Severe ataxia  
Strong positional nystagmus

H.I. Cerebellar medulloblastoma

## Cerebellar Medulloblastoma

- Mainly affects children
- Begins in cerebellar nodulus -- vestibulocerebellum
- Hydrocephalus (projectile vomiting) and cerebellar signs.
- Treat with resection, chemotherapy and radiation.
- 5 year survival – 80%



MIDLINE CEREBELLAR MEDULLOBLASTOMA

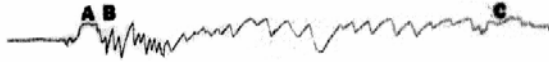
## Treatment of Cerebellar Dizziness

- Vestibular Suppressants – especially benzodiazepines
- ? Agents that promote compensation – Betahistine, Amantadine, Baclofen
- Vestibular rehabilitation
- Environmental adaptations

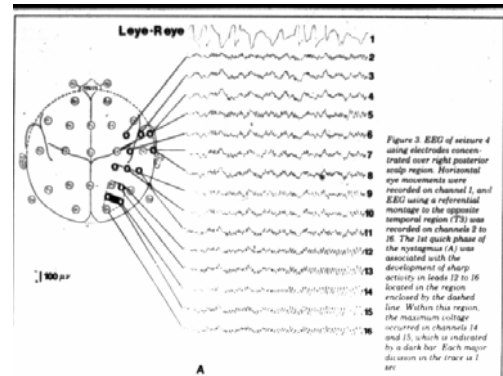
## Case

- 8 Year old became dizzy playing video games
- Mother noted the eyes jumped
- Transient confusion

In the clinic he had a spell of dizziness with clear nystagmus



EEG shows seizure during nystagmus



## Seizures causing Dizziness

- Quick spins (1-2 seconds)
  - Also caused by vestibular nerve irritation
- Confusion and dizziness
- May be triggered by flashing lights
- Head injury is common
- Oxcarbamazine may stop them

## Migraine & Vertigo: Prevalence

- Migraine:
  - 10% of U.S. population has Migraine<sup>†</sup>
  - 20-30% of women childbearing age
- Vertigo: 35% of migraine population.\*
- Migraine + vertigo (MAV):
  - ~ 3.5% of U.S. pop.
  - ~ 10% of women of childbearing age

<sup>†</sup> Lipton and Stewart 1993; Stewart et al, 1994

\*Kayan/Hood, 1984; Selby/Lance, 1960; Kuritzky, et al, 1981

## Diagnosis of MAV

Nystagmus

- No definitive pattern
- Often low amplitude downbeating or upbeating nystagmus
- ? Due to cerebellar disturbance

## Diagnosis of MAV

Clinical judgment

- Headaches and dizziness
- Lack of alternative explanation (normal otological exam, neurological exam, CT)
- High index of suspicion in women of childbearing age. Perimenstrual pattern.
- Family history in 50%
- Response to prophylactic medication or a triptan

### CSF pressure problems Orthostatic symptoms

- CSF leak
  - Post-LP dizziness/nausea/headache
  - Post-epidural dizziness/hearing loss/tinnitus
  - Idiopathic
- No nystagmus

### CSF-pressure problems Normal pressure hydrocephalus

- Ataxic/Apraxic gait
- No vertigo, hearing problems or cerebellar signs
- Respond to spinal tap followed by shunt

### Diagnostic Categories

- Neurological (i.e. posterior fossa)
- Medical
- Psychological (anxiety, malingering)
- Undiagnosed

### “Medical Dizziness” 30% of ER dizzy cases

- Cardiovascular (23-43%)
  - Orthostatic hypotension
  - Arrhythmia
- Infection (4-40%)
- Medication (7-12%)
- Hypoglycemia (4-5%)



Source: Madlon Kay (85), Herr et al (89)

### Psychogenic Vertigo Substantial – perhaps 20%

- Anxiety, hyperventilation, panic, Agoraphobia
- Somatization
- Malingering

### Anxiety

- Long-duration dizziness
- Situational
- Responds to benzodiazepines
- Some have vestibular disorders too

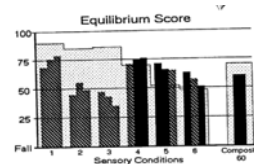


## Somatization

- Chronic dizziness
- Numerous bodily ailments
- One goes away to be replaced by another
- We don't have a treatment for SD.
- Do not tell these people there is "nothing wrong". Rather, try to minimize the health-care cost.

## We have several good tests for Malingering

- Moving Platform Posturography -- An algorithm for detecting inconsistency (Cevette score)

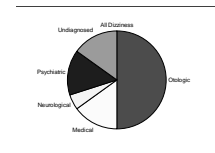


## Undiagnosed Dizziness

- About 15% of all dizzy patients
- Our tests are not 100% sensitive
- We are not perfect either

## Summary – non otologic dizziness

- Neurological (i.e. Migraine, posterior fossa)
- Medical (i.e. low blood pressure)
- Psychological (anxiety, malingering)
- Undiagnosed



## More details

Hain, T.C. Approach to the patient with Dizziness and Vertigo. Practical Neurology (Ed. Biller), 2002. Lippincott-Raven

## More movies

[www.dizziness-and-balance.com](http://www.dizziness-and-balance.com)