The Dizzy Patient
Recent advances (2007)

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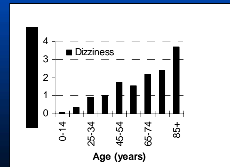
Dizziness is VERY Common

- 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).

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

Diagnostic Categories

Category	Example
Otological	Meniere's disease
Neurological	Migraine
Medical	Low BP
Psychological	Anxiety
Undiagnosed	Post-traumatic vertigo

Question

- 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 specialty
  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%)

Tertiary care heuristics: multiple causes of dizziness, overlapping signs/symptoms

- Complete history (questionnaire)
- Examination (otological, neurological, some medical, some psychiatry)
- Pick off easy ones – BPPV, Menieres, Orthostatic hpn.
- Have a plan to deal with the rest

Otologic Dizziness

- BPPV (benign paroxysmal positional vertigo) -- about 50% of otologic, 20% all
- Meniere's disease -- about 20%
- Vestibular neuritis and related conditions (15%)
- Bilateral vestibular loss (about 1%)
- Fistula and related conditions

Positional Vertigo
The most common syndrome

- Benign Paroxysmal Positional Vertigo (BPPV)
- Orthostatic hypotension
- Central positional nystagmus
- Low CSF pressure syndrome

Benign Paroxysmal Positional Vertigo (BPPV)

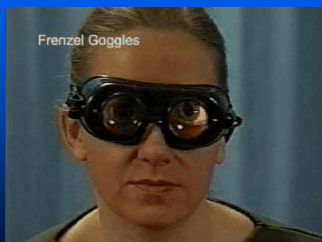
61 Y/O man slipped on wet floor.

LOC for 20 minutes.

In ER, unable to sit up because of dizziness

Hallpike Maneuver: Positive

Positional Vertigo
Dix-Hallpike Maneuver

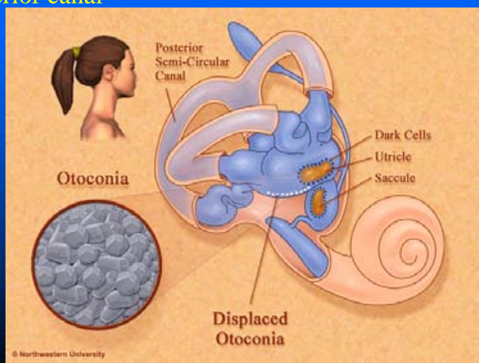


Benign Paroxysmal Positional Vertigo (BPPV)

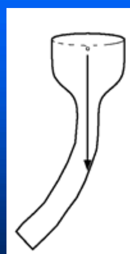
- 20% of <u>all</u> vertigo
- Brief and strong
- Provoked by change of head position (Bed spins)
- Definitively diagnosed by Hallpike test

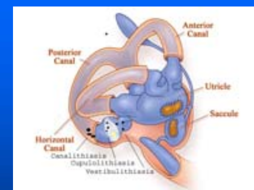
http://www.dizziness-and-balance.com/disorders/bppv/bppv.html

BPPV Mechanism: Utricular debris migrates to posterior canal



New: Mechanism of Latency and fatigue





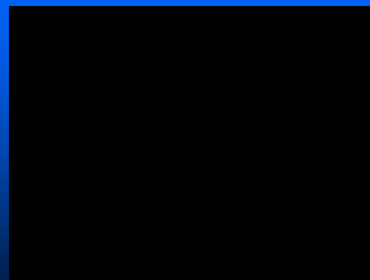
- Hydrodynamic advantage is less in ampulla
- Margination -- fatigue

Squires T, Weidman M, Hain T, Stone H. A mathematical model for top-shelf vertigo: the role of sedimenting otoconia in BPPV. J. Biomech. vol. 37, issue 8, pp 1137-1146, 2004

•Epley Maneuver for BPPV

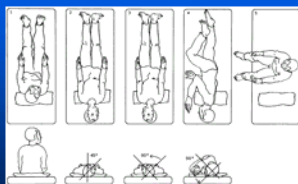
- Move debris out of posterior canal by gravity
- Each position for 30 seconds.
- Three repetitions
- 75-90% cure rate

Epley Maneuver Demonstration



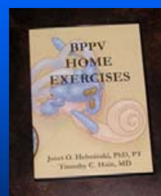
New: Home Epley Maneuver

- Each position for 30 seconds.
- Three repetitions
- 95% cure in one week
- Need to know side



Radke et al, 1999; Furman and Hain, 2004

Educational Material



We make heavy use of a practice DVD

Demonstrates the Home-Epley

http://www.dizziness-and-balance.com/disorders/bppv/bppvdvd.htm

Results of Epley Maneuver

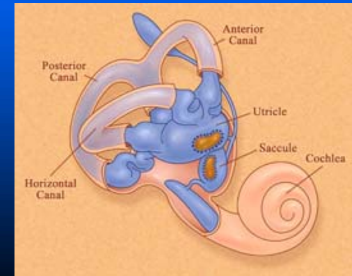
- There are many good controlled studies of Epley maneuver (New)
- Most authors report 75% cure from a single treatment, and >95% from repeated treatments (or Home Epley).
- The Epley maneuver is the treatment of choice for classic BPPV.

Epley JM. The canalith repositioning procedure: For treatment of benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg 1992 Sep;107(3):399-404.

BPPV Variants

Ewald's first law: eye movements occur in the plane of the canal being stimulated. Three canals → three vectors.

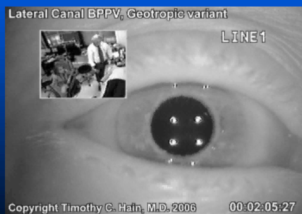
- Posterior canal
- Lateral canal
- Anterior canal



Direction Changing Horizontal Positional Nystagmus (DCPN) is seen in lateral canal BPPV

Lateral Canal (5%)

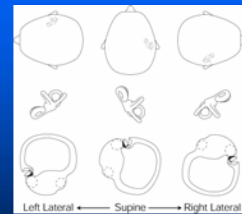
- Horizontal DCPN



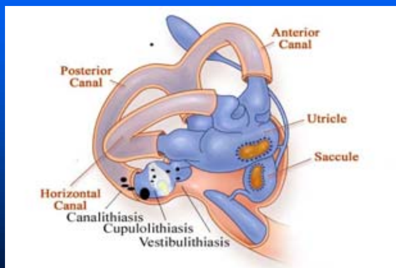
Diagnosis of Lateral Canal BPPV

Right ear has debris

- Debris deposited in lateral canal
- Direction changing Horizontal nystagmus
- Can be on either side of loop
- Geotropic or Ageotropic, depending on starting location of dirigible debris.



Lateral Canal – BPPV Treatment Roll debris out



HC – BPPV Treatment

- Log Roll - 270º rotation around longitudinal axis at 90° increments in the recumbent position. Illustrated for canalithiasis right HC.
- Performed by clinician or self treatment.
- 3 cycles of exercise. If self treatment, 3 times per day.
- Outcome: 71% cured within 1 treatment (Nuti, et. al., 1998).

- There are no controlled studies of HC treatment

Unilateral Vestibular Loss
Recent Advances

- Vestibular Neuritis/Labyrinthitis -- steroids
- Meniere's disease (unusual) – low dose gentamicin
- Acoustic Neuroma (very rare) – gamma knife

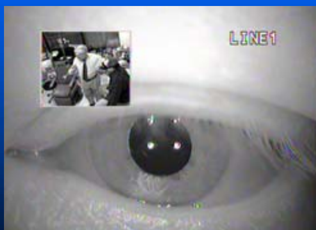
Vestibular Neuritis: Case

56 y/o woman began to become dizzy after lunch. Dizziness increased over hours, and consisted of a spinning "merri-go-round" sensation, combined with unsteadiness.

Vomiting began 2 hours later, and she was brought by family members to the ER.

http://www.dizziness-and-balance.com/disorders/unilat/vneurit.html

Vestibular Spontaneous Nystagmus seen with video Frenzel Goggles (about 1 week later)



Aside for how to examine for SN

Should indicate beating direction and amount – weak, moderate, strong.

- Frenzel Goggles (best)
- Ophthalmoscope (good – but backwards)
- Gaze-evoked nystagmus (pretty good)

Vestibular Neuritis

- Viral infection of vestibular nerve – superior division mainly
- HSV-1 ?
- Disability typically lasts 2 weeks.
- **New: Course of Steroids**
- Symptomatic Rx (meclizine, phenergan, benzodiazepine)
- These patients can still get BPPV !

Strupp M and others. Methylprednisolone, valacyclovir or the combination for vestibular neuritis. NEJM 35:4, July 22, 2004. 354-361

Meniere's Disease

- Meniere's disease
  - Uncommon disorder (1/2000)
  - Hearing loss, tinnitus, and vertigo
  - Chronic disease with high morbidity

Hydrops

Meniere’s disease
Old treatment paradigms

- Numerous placebo treatments (e.g. vitamins, even some placebo surgery)
- Salt restriction and/or diuretic -- ineffective
- Vestibular suppressants for dizziness – after the event treatments
- Destroy inner ear for severe cases
  - 95% effective but often results in deafness

New treatment for Menieres

Driscoll CL, Kasperbauer JL, Facer GW, Harner SG, Beatty CW. Low-dose intratympanic gentamicin and the treatment of Meniere's disease: preliminary results. Laryngoscope 107(1):83-9, 1997

Low dose Gentamicin

- 1-2 Injections into middle ear
- 80% effective
- No side effects (well almost)
- Very rapid adoption in US

Low-dose gentamicin is a remarkable advance

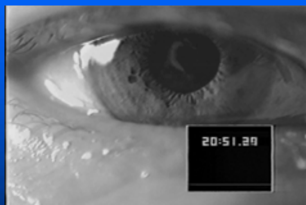
- Better quality of life for Meniere’s sufferer’s
- Less or no medication
- No damage to ear from treatment itself

Superior Canal Dehiscence
New appreciation for disease

•Retired plastic surgeon, complained that when he went to church, when organ was playing, certain notes made him stagger.

•Other parishioners suspected he was drunk.

Tullio



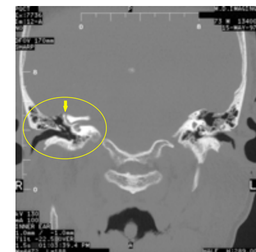
•During hearing testing, certain tones reliably induced dizziness and a mixed vertical/torsional nystagmus.

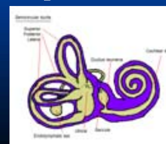
•This “Tullio’s phenomenon” could be easily reproduced at bedside

http://www.dizziness-and-balance.com/disorders/unilat/scd.html

Superior Canal Dehiscence

Pressure in ear causes endolymph movement in superior canal



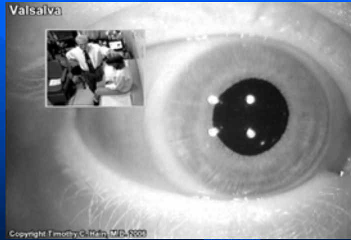


Tullio

Nystagmus with loud noise

Abnormal VEMP/T-bone CT (ask for **direct coronals**)

Valsalva – harder to see but far more reliable than Tullio



Electrical phenomena causing Dizziness – new appreciation and improved treatment

- **Quick spins** (1-2 seconds) – Vestibular paroxysmia.
- Causes –
  - Idiopathic (? Neuralgia, microvascular compression)
  - Vestibular nerve irritation/surgery (Moon and Hain, 2005)
- Oxcarbamazine (Trileptal) may stop them

Migraine & Vertigo: Prevalence

- Migraine:
  - 10% of U.S. population has Migraine†
  - 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

† Lipton and Stewart 1993; Stewart et al, 1994

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

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

Treatment of MAV

- Diet (avoid migraine triggers – basically things that taste good)
- Prophylactic medications
  - **Topiramate 25 to 50 mg daily**
  - Verapamil 120 mg SR
  - Propranolol and other beta-blockers
  - Tricyclics (nortriptyline, amitriptyline)
  - Depakote

http://www.dizziness-and-balance.com/disorders/central/migraine/mav.html

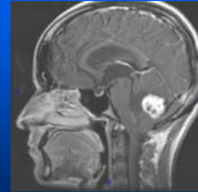
Question #3

- A 30 year old woman presents to your office with dizziness and headaches. You should:
  1. Refer to your local friendly neurologist
  2. Examine her, and if normal attempt migraine prophylactic treatment
  3. Get an MRI scan to be sure she doesn't have a brain tumor.

Answer

- 3.5% of the population has migraine and dizziness. 10% has migraines.
- There are not enough neurologists to treat all of these patients.
- It is unreasonable to perform MRI on every patient with headaches (10% of population has migraine headaches)
- Examine her, and if normal, attempt migraine prophylactic treatment

Don't just treat and leave out the exam part – a cautionary tale



- The patient whose MRI is shown presented with dizziness, unsteadiness and headaches. His examination showed a modest positional nystagmus, as well as **papilledema.**
- After the papilledema was seen, he had an MRI done and was admitted immediately for neurosurgery.
- This is rare, but still you have to look.

Dizzy Update 2007
Recent Advances

- BPPV – Home treatments
- Vestibular Neuritis -- steroids
- Meniere's disease – low dose gentamicin
- Superior Canal Dehiscence – common cause of sound sensitivity
- Quick spins – electrical type dizziness
- Migraine – topiramate treatment

More details

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

www.dizziness-and-balance.com