

Vestibular Disorders: Central

Scott K Sanders, MD, PhD
September 21, 2023

Speaker Disclosure

Indiana Hearing Specialists offer the sale of hearing aids manufactured by Oticon, Phonak, Starkey and Resound. Please note all relevant financial relationships have been mitigated.

Central Vestibular Disorders

Migraine and Dizziness

"Migraine simply causes more vertigo than any other condition"

- Timothy Hain, MD, PhD

"Approximately 60-80% of patients who experience recurrent vertigo without hearing loss have migraines"

- Brandtberg and Furman, 2005

A Typical Story

Doc, I have had some dizziness now and then in the past, but nothing like this. You're going to think I'm crazy when I tell you how I feel. I'm not even sure how to describe it. My head just doesn't feel right and my eyes and head don't seem to move together, like my eyes lag behind my head. When my family doctor had me follow his finger with my eyes, that really made me feel dizzy. I don't feel safe driving sometimes and being on a highway with semi trucks going by makes it worse. I have lots of trouble in big stores with the fluorescent lights and all the motion. When the weather changes, this often makes me feel more dizzy. I have had sinus headaches in the past, but I've not really had much of a problem with headaches, maybe one or two bad headaches many years ago.

Migraine-associated Dizziness

- The #1 cause of dizziness
- Under-recognized
- Often have mild or no concurrent headaches, but usually have a headache history ('sinus headache' = migraine)
- "Pressure"

AAO-HNS meeting 2011

- Migraine-related dizziness
 - "gigantic topic"
 - "huge as a cause of dizziness"
 - "dominates our practice"
 - "15 times more common than Meniere's"

Migraine-associated Dizziness

Symptoms

- Dizziness that is often difficult to describe
- Morning predominance of symptoms
- Wide range of duration
- Visual motion sensitivity is common
- Grocery shopping is difficult (big box stores)
- May have light and/or noise sensitivity
- Usually have a history of headaches, but often no concurrent headaches; "pressure"

Migraine-associated Dizziness

Diagnosis

- Rule out other causes - vestibular function testing usually adequate if neurologic exam and hearing is normal

Treatment

- Eliminating any triggers
- Preventative medications

Migraine-associated Dizziness

Treatment

- Identification and modification/elimination of triggers
- Medications
 - Tricyclic
 - amitriptyline*
 - nortriptyline*
 - SSRI
 - venlafaxine
 - Anti-hypertensive
 - verapamil*
 - propranolol
 - Anti-seizure
 - valproic acid*
 - topiramate*
 - gabapentin

Prognosis - Excellent!

Non-food Triggers

- Inadequate sleep
- Weather changes
- Hormone changes
- Stress
- Allergies

Food Triggers

- MSG
- Nutrasweet
- Packaged meats
- Nuts
- Alcohol

Tricyclic Antidepressants

nortriptyline - 10, 25, 50, 75 mg

amitriptyline - 10, 25, 50, 75, 100 mg

- Take once daily 1-2 hours before bedtime
- Side effects
 - 3 "D"s - **D**rowsiness (amitrip > nortrip), **D**ry mouth, weird **D**reams
 - other less common - weight gain, heartburn, palpitations, moodiness/angry

Anti-Hypertensive

verapamil (SR) 120, 180, 240, 300, 360 mg

- Take once daily at breakfast
- Side effects
 - constipation
 - rarely peripheral edema, palpitations

Anti-epileptics

valproic acid (ER) 125, 250, 500 mg

- Take once daily
 - Side effects - weight gain, hair loss, tremor, drowsiness, nausea
 - Avoid in women of child bearing age (neural tube defects)
- topiramate (has ER form available now) 25, 50, 100, 200 mg
- Take twice daily
 - Side effects - paresthesias, taste alteration, weight loss, confusion ("dopamax"), reduced sweating, kidney stones
 - rare angle closure glaucoma

Monitoring Medication Treatment

- Dosing - start low and go slow
- Improvement delayed for 3-4 weeks after starting and after dose changes
- If not working, try alternative
- If no symptoms for 6 months, consider tapering/stopping

Neuhauser criteria for migrainous vertigo (2005)

- Recurrent vestibular symptoms
- Migraine headache meeting criteria (current or previous)
- At least one of the following migrainous symptoms during at least two of the attacks
 - migraine-type headache
 - visual or other aura
 - photophobia
 - phonophobia
- Other causes ruled out

Migraine-associated Vertigo (MV)

- in Curr Pain Headache Rep, 2007 June

- “A strong association exists between vertigo and migraine with MV being the most common cause of spontaneous (non-positional) vertigo”
- “Symptoms can be quite variable among patients and within individual patients over time, creating a diagnostic challenge”.
- “MV generally presents with attacks of spontaneous or positional vertigo lasting seconds to days with associated migrainous symptoms”.
- “...proper studies of optimal MV management are just beginning”.

Migraine is #1

If BPPV is unlikely / ruled out and there is no hearing loss or neurologic symptoms in the setting of recurrent dizziness / vertigo - ALWAYS consider migraine, even if no headaches

Brain Tumors

Quote from Down Under

Balance disorders are common while brain tumors are rare. An isolated balance disorder is thus rarely the presenting symptom of a brain tumor, and some physicians, *particularly in countries infested with lawyers*, worry about missing a brain tumor

- Hirose & Halmagyi, 1996 (Australia)

A Typical Story

Doc, I have never really been dizzy and I have never had vertigo, but over the past couple of years, my balance isn't right - I tend to veer to the side. I also noticed I don't hear my cell phone as well on one side.

Who would order an MRI scan?

Left Vestibular Nerve Weakness

Caloric Testing

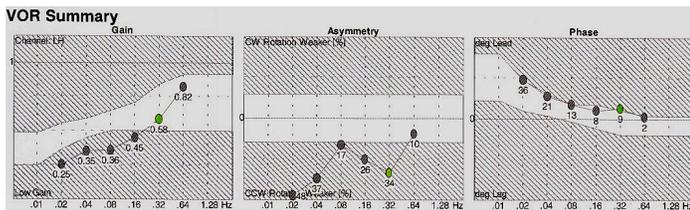
Spontaneous Nystagmus



Left < Right Right-beat Nystagmus

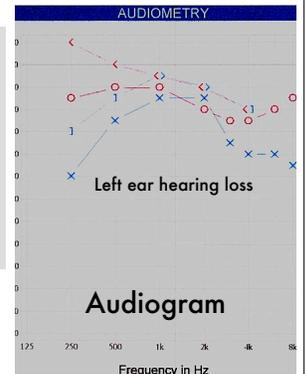
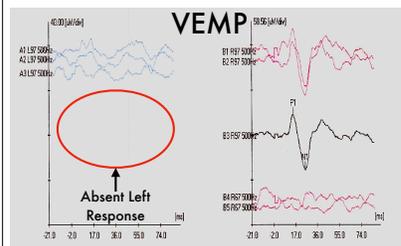
Vestibular Asymmetry

Rotary Chair

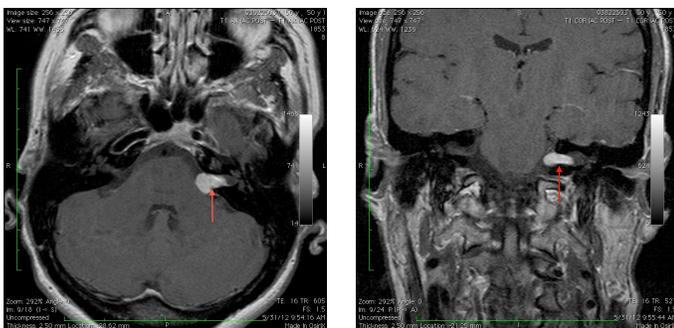


Vestibular System Asymmetry

Left Vestibular Nerve Weakness and Hearing Loss



Vestibular Schwannoma



* MUST use contrast

Neuro-imaging

- In deciding about whether a neuro-imaging procedure is needed, consider:
 - patient symptoms - neurologic?
 - abnormal neurologic exam findings
 - vestibular function study findings
 - Vestibular function testing is MUCH cheaper than an MRI

Stroke and TIA

Stroke

- Posterior (Vertebrobasilar) Circulation serves brain regions involved in dizziness and vertigo (**NOT carotid arteries**)
- Often have multiple neurologic symptoms with TIA or stroke, rarely if ever just dizziness/vertigo

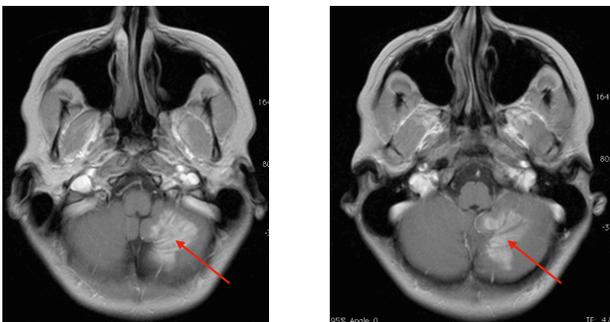
Case

- 25 year old woman suffered her first spell of vertigo in a bar (celebrating after finals) and was unable to walk out of the bar without assistance
- Recent past medical history includes that she had been studying for finals and having some neck discomfort, so she saw a chiropractor for a cervical manipulation
- She was taken to ER where a CT was performed
- CT of the brain was normal and she was diagnosed with "labyrinthitis"
- She was sent home

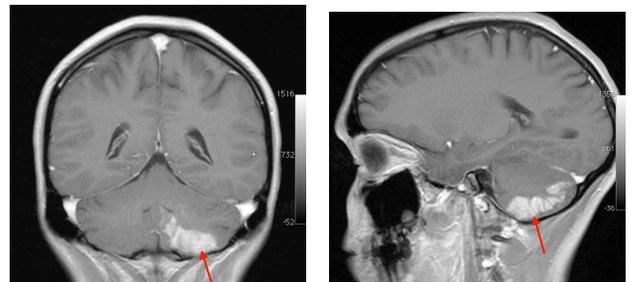
Case

- She had vertigo and was vomiting for 12 hours
- Felt as though the world was "shifted to the left"
- Tongue and lips felt numb
- Noted diplopia when trying to focus
- Headache left neck radiating to behind left eye

Case - MRI

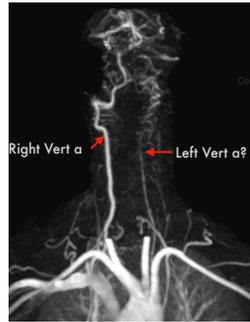
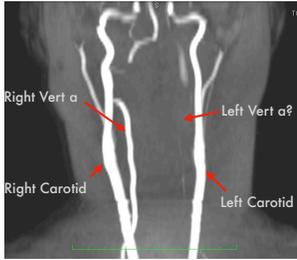


Case - MRI

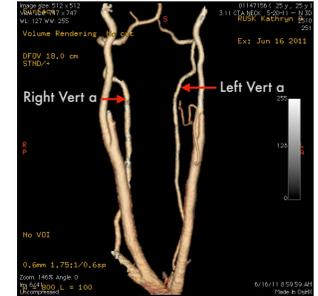
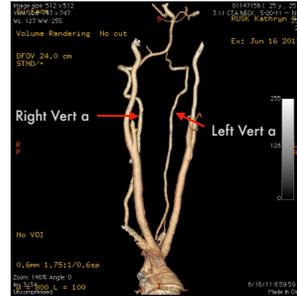


If edema develops, can lead to brainstem compression..... and death!

Case - MRA



Case - CTA 6 Months Later

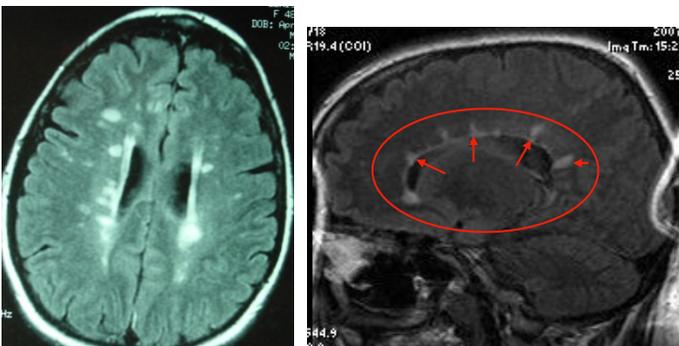


Multiple Sclerosis

Multiple Sclerosis (MS)

- Demyelinating Disease of Brain
- Causes ANY Neurologic Symptom, including dizziness, vertigo and imbalance

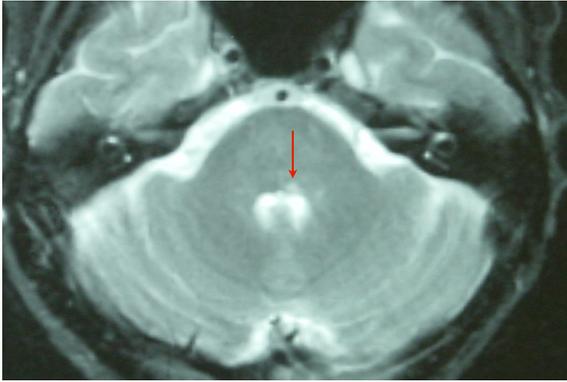
MRI in MS



Internuclear Ophthalmoplegia (INO)



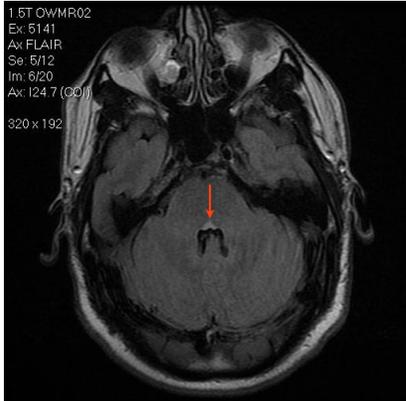
MRI of Left INO



Bilateral INO



MRI of bilateral INO



My Cell# (317) 446-4662

Office Locations

Indianapolis

9106 N Meridian, Ste 200
Indianapolis, IN 46260

Lafayette

3721 Rome Drive, Ste A
Lafayette, IN 47905

(888) 888-DIZZY (3499)