Management of Atypical Vestibular Disorders: Beyond BPPV, Vestibular Neuritis, and Acoustic Neuroma

CSM 2014 Las Vegas
Rachel D. Trommelen, PT, DPT, NCS
Laura Morris, PT, NCS
Janene Holmberg, PT, DPT, NCS
Objectives:

Upon completion of this presentation, the learner will be able to

1) Articulate the pathophysiology of selected atypical vestibular disorders
2) Articulate theoretical mechanisms that would support management of atypical vestibular disorders with vestibular rehabilitation
3) Select appropriate tests and measures to identify impairments of body structure and/or function, activity limitations, and participation limitations
4) Identify strategies used by experts in the field to reduce symptoms of dizziness, improve balance control, and optimize function in patients with atypical vestibular disorders
5) Identify options for management of patients with atypical vestibular disorders which have little or no evidence-based support.
6) Articulate future direction of research into the effectiveness of vestibular rehabilitation with atypical vestibular disorders
Why this topic?
Case 1: CB

- Referral from neurotologist: Migraine Associated Dizziness vs. Meniere’s
- Pt. is a 49 y/o female presenting with gradual onset of dizziness, nausea, and imbalance past 6 months.
- Symptoms progressively worsening over time
- PMHx: Migraines (daily past few months, severe a few times, hormonal relationship, sensitivity to smells, lights, sounds), Premenstrual Dysphoric Disorder
- Medications: Seasonique, Ambien CR. ENT placed patient on betahistine and diazide
CB

**Symptoms**
- Gradual worsening
- 0/10 at present and best, 10/10 at worst (off medications, even when wearing sunglasses)
- Tempo: Hours
- Frequency: 1-2 times per week, but nauseous daily
- Description: “Wooziness” “unsettled” “unsteady”
- Blurry vision at distance
- Imbalance and near falls, no falls
- Pressure and ringing, bilaterally ears (intermittent)

**Oculomotor Findings**
- All beside tests negative except positive left head thrust, VOR dysfunction
- VOR testing positive in sitting, elicited mild symptoms
- Hallpike-Dix and rolls tests negative bilaterally
- VNG findings: Abnormal ECoG in left ear (suggestive of hydrops), abnormal VEMP left ear with oscillopsia
CB: Objective Findings

- Balance/Gait
  - ABC: 73%
  - Static Balance: mCTSIB, SLS, Romberg, and Sharp Romberg EO 30". Romberg EC 30", Sharp Romberg EC 15"
  - Functional Gait Assessment: 27/30
  - Gait speed: 3.85 ft/sec
- PANAS: Negative for anxiety/depression
- Oscillopsia VAS: 6.5 cm, 5.8 cm, and 7.5 cm respectively for sitting, walking, and driving
Activity and Participation Limitations

- Mother to 17 y/o son
- Owns a boutique shop
- Lives in 1 story home
- Can’t walk in a dark room, more careful on a ladder, lingers in bed longer, more symptom at work
- Limiting driving: Let’s friends drive, uncomfortable driving longer distances
- Patient goals: “Feel Better”
CB: Clinical Impression

- Presentation c/w MAD vs. Meniere’s
- Should benefit from VRT for vestibular adaptation, habituation, and balance training
Intervention

- VOR and balance exercises for 2 weeks. Minimal improvements, but limited compliance with HEP week 1
- CT scan revealed Superior Semicircular Canal Dehiscence (SSCD)
- MD recommended surgical treatment, thus patient D/C’ed from PT
- Returned to PT approximately 4 month post surgery
Superior Semi-Circular Canal Dehiscence

- Small hole develops in the temporal bone, and the superior semicircular canal moves into that hole
  - Genetic
  - Trauma
- Causes an abnormal communication between superior semicircular canal and brain
- Created a “third mobile window” which causes increased sensitivity to sound and pressure changes
- First described by Minor and colleagues in 1998

http://vestibular.org/superior-canal-dehiscence-scd

Chein, 2011
Pfammatter, 2010
SSCD

Signs

- Vertical and torsional eye movements with sound or pressure induced symptoms
- CT scan abnormalities
- VEMP's lower in affected ear
- May see Weber test positive to affected ear
- Autophony

 Symptoms

- Oscillopsia & Dizziness induced by loud sounds
- 59% of patients will report history of symptoms with vigorous valsala

Chien, 2011
VEMPs findings with SSCD

- **Cervical VEMPs**: Tests inferior vestibular nerve and saccule
- **Ocular VEMPs**
  - Utricle and superior vestibular nerve
  - Not done as often due to difficult test
- **VEMP**s positive with fistula because the inner ear is more sensitive to sound, therefore you get a VEMP at a lower loudness level than normal
  - The wave form would not flatten out
- This VEMP demonstrates a decreased amplitude, indicating involvement of left side
SSCD: CT Scan Image

Chien, 2011
SSCD: Clinical Classification

- Cochlearvestibular signs and symptoms (78%)
  - Signs described above in most patients
  - Attributed to larger size (6 mm or greater)
- Cochlear signs and symptoms (15%)
  - Conductive and mixed hearing loss
  - Small dehiscence (1-2 mm)
- Vestibular Signs and symptoms (7%)
  - Dizziness, loss of balance, and torsional nystagmus with valsalva
  - Small Dehiscence (0.5-1 mm)

Pfammatter, 2010
SSCD: Does Size Matter?

- Symptom description
- VEMP: Larger lesion produced lower VEMP
- Larger lesions more often has positive findings of Tullio-phenomenon, Hennebert sign, and/or valsalva
- However the pattern of these findings is different for dehiscences of all sizes

Pfammatter, 2010
Treatment Options

- **Conservative Management:**
  - Avoidance of symptom provoking activity

- **Surgical Management**
  - Repair through middle cranial fossa approach
  - Plugging canal
  - Transmastoid approach
  - All surgical approaches affective in reducing or eliminating vestibular and auditory symptoms

Chien, 2011
Post-Surgical Management

- S/p Canal Plugging with middle cranial fossa approach
- Post-Op testing for unilateral hypofunction
  - Tested immediately post-op (1-7 days) and 6-29 weeks post op
  - Identified by positive head thrust test (performed with camera analysis)
  - 38% presented with hypofunction in immediate post-op period, 11% at 6 week f/u
- Conclusion: More often immediate post-op, typically resolves. Larger dehiscence increases risk of vestibular hypofunction
- NO mention of vestibular rehabilitation

FIG. 1. Odds of vestibular hypofunction in the initial postoperative period (1–7 d postoperatively) as a function of superior semicircular canal dehiscence length (in millimeters). The odds of immediate vestibular hypofunction are 0.5 to 1 (or 50%) at a dehiscence length of 4.59 mm.

Agrawal, 2009
Janky, 2012

- Examined the balance and vestibular loss and recovery s/p canal plugging to treat SSCD
- 30 subjects, (10 each group) : Pre-op 1 week post-op, and 6 weeks post-up or greater intervals
- Results
  - Static (mCTSIB condition 4) and Dynamic (DGI) balance impaired post operatively but recovered by 6 weeks
  - No difference at all points in five repetition sit to stand and gait speed, subjective visual vertical
  - Presence of positive head thrust test postoperatively and at 6 weeks
  - Spontaneous and/or post head shaking nystagmus present 1 week after surgery, and the direction of nystagmus can indicate peripheral vestibular system function
- Discussion
  - Unknown mechanism for vestibular dysfunction after surgery
  - Patients have deficits in balance and vestibular function, which makes them candidates for vestibular rehabilitation
  - Use Head thrust test, spontaneous nystagmus, and post head shaking nystagmus to determine peripheral vestibular system involvement
CB: Re-eval Findings

**Symptoms**
- Symptoms gradually improving
- 0/10 at present and best, 5/10 at worst (with bending and head and eye movements)
- Tempo: seconds
- Frequency: whenever completing provoking movements
- Description: “Wooziness” “top heavy” “wobbly”
- Blurry vision when walking with head turns
- Imbalance and with no falls or near falls
- Ringing intermittently

**Functional Limitations**
- Less cooking, increased fatigue
- Not working (closed store)
- Not driving
- Process of moving
- Gained 30 lbs since PT discharge, wants to start fitness routing with trainer for weight loss
- Patient goals: “To be able to drive” and “less wooziness”
Re-eval Findings

- **Balance/Gait**
  - ABC: 62%
  - Static Balance: mCTSIB, SLS, Romberg, and Sharp Romberg EO 30". Romberg EC 30", Sharp Romberg EC 15"
  - Functional Gait Assessment: 23/30
  - Gait speed: 3.23 ft/sec
- **PANAS:** Negative for anxiety/depression
- **Oscillopsia VAS:** 1.0 cm, 1.2 cm, and 4.2 cm respectively for sitting, walking, and driving

Interventions

- **VOR:** sitting, standing, romberg, walking forwards, walking forwards and backwards
- **Balance training:** Gait with head and body turns, static standing balance in variety of positions with EC and/or foam
- **Optokinetic Stimulation:** Youtube videos initially and progression to stimulating body environments
- **Habituation:** Turns, with and without ball toss
- **10 visits over 10 weeks**
Outcomes: CB

Initial
- ABC: 62%
- FGA: 23/30
- Gait speed: 3.23 ft/sec

Activity and participation limitations

Outcomes
- ABC: 86.9%
- FGA: 29/30
- Gait Speed: 3.89 ft/sec

Activity and participation
- Patient able to drive 15 minutes without symptoms
- Able to work out with trainer at gym without symptoms
- Resumed all ADL’s and household chores without dizziness
Case 2: GC

- Patient is a 41 y/o female presenting from neurotologist with dx of vestibular neuritis and history of migraine variant
- Patient complains of baseline motion sensitivity
- Sudden vestibular crisis event in February/March 2010, diagnosed with labyrinthitis. Resolved with acupuncture
- Symptoms came back May 2013 mildly, but progressed to severe after bending over. Severe for a few days then decreased
- Reports HA after episode
- PMHx: C-section, Psorasis inner ear, migraine disorder
- Migraine Hx: Last migraine a few years ago. Reports mild HA few per month
GC

**Symptoms**
- Gradual improvement
- 2/10 at present and best, 10/10 at worst (episode in may)
- Tempo: Constant
- Description: “Bobble head” and “Interia”
- Self reported oscillopsia
- Imbalance and near falls, no falls
- Pulsatile sensation in inner ear: MD attributed to debris in ear

**Oculomotor Findings**
- All beside tests negative except positive right head thrust, VOR dysfunction
- VOR testing positive in sitting, elicited mild symptoms
- Hallpike-Dix and rolls tests negative bilaterally
GC: Objective Findings

- **Balance/Gait**
  - ABC: 80%
  - Static Balance: mCTSIB, SLS and Sharp Romberg EO/EC 30”
  - Functional Gait Assessment: 26/30
  - Gait speed: 3.57 ft/sec

- **Situational Vertigo Questionnaire**: 2.35

- **DHI**: 40/100

- **PANAS**: Negative for anxiety/depression

- **Oscillopsia VAS**: 1.0 cm, 0.5 cm, and 1.8 cm respectively for sitting, walking, and driving
Activity and Participation Limitations

- Wife, mother to 3 y/o son
- Plans to start work as school RN (6 hrs/day) in 3-4 weeks
- Lives in 2 story home
- Stopped walking and doing yoga
- Limiting driving
- Patient goals: “Not to be dizzy”
GC: Clinical Impression

- Didn’t fit Vestibular Neuritis or Meniere’s
- Peripheral unilateral weakness
- Appeared stable
- Let’s start a program and monitor
- Patient was about to go on vacation to Brazil, and was aggressive about scheduling and starting PT to get some symptom relief before trip
Intervention

- VOR and balance exercises for 2 weeks. Reports improvement
- Day before vacation (2 weeks to Brazil), patient received results of CT revealing SSCD
- Patient continued exercises as able during vacation
- Follow-up with MD while patient on vacation: opting for conservative management
- Continuation of full VOR and balance exercise progression followed by 4 weeks of optokinetic stimulation program
- Total time: 8 sessions over 9 weeks
VNG Findings

- Normal VEMPs, Normal Tullio, Normal Fistula
- Tullio Abnormal: Slight lightheadedness when vibration was stopped to each mastoid
## Outcomes: GC

<table>
<thead>
<tr>
<th>Initial</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>DHI: 40/100</td>
<td>DHI: 6/100</td>
</tr>
<tr>
<td>ABC: 81%</td>
<td>ABC: 92.5%</td>
</tr>
<tr>
<td>FGA: 26/30</td>
<td>FGA: 30/30</td>
</tr>
<tr>
<td>SVQ: 2.35</td>
<td>SVQ: 0.86</td>
</tr>
<tr>
<td>Activity and participation limitations</td>
<td>Activity and participation</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Able to care for son without difficulties or symptoms</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Able to complete all work/home tasks without difficulty</td>
</tr>
<tr>
<td><img src="image5.png" alt="Image" /></td>
<td>Return to Yoga and walking for exercise</td>
</tr>
<tr>
<td><img src="image6.png" alt="Image" /></td>
<td>Reports no dizziness X 1 week, no limitations in daily life</td>
</tr>
</tbody>
</table>
Hindsight is 20/20

- Paid more attention to auditory symptoms
- Symptoms with bending could be due to valsalva and not only movement itself
Case Study: Bill

- 54 y.o. high school math teacher
- Very supportive family, exercised regularly
- Underwent aortic aneurysm repair 4 weeks prior
- Presented with symptoms of dizziness, imbalance, inability to read
Management of Atypical Vestibular Disorders: Beyond BPPV, Vestibular Neuritis, and Acoustic Neuroma

CSM 2014 Las Vegas
Rachel D. Trommelen, PT, DPT, NCS
*Laura Morris, PT, NCS
Janene Holmberg, PT, DPT, NCS
Case Study: Bill
WHAT IS THIS?!?

- Rare saccadic eye movement disorder


What does the evidence say?

- Not much in the way of recovery
- Description of impairments
Clinical Assessment

- VOR intact
- Smooth pursuit intact
- VOR suppression intact
- Vergence intact
- VERY slow saccades
Objective outcome assessment

- Unable to complete King-Devick testing
- Used timed reading sample instead
  - Initial, monthly to record progress
- Saccadic eye task with two targets 3 feet apart, pt. arm’s length away, head and eye movement required
  - Initially, 7 seconds to right, 4 to left
Assessment

- Gait
  - Functional Gait Assessment
    - 18/30 = risk for falls
    - Difficulty with head turns in gait, turning around, obstacle negotiation
  - Static balance
    - WNL
  - Dynamic balance
    - Head turns in standing caused marked postural instability
Functional Impairment

- Unable to read
- Unable to drive
- ADLs- slow, increased energy required
  - Buttoning shirt
  - Finding desired object
- Entering room
  - Difficulty assessing environment
- Community environments
  - Required assist due to impairment in visual scanning
Intervention

• Utilize intact systems
  – Target following during gait, visual scanning
  – Rapid head turn with blink for compensatory technique
• Saccadic training
  – Large words for reading
  – Visual scanning- simple
• Used peripheral vision to manage complex environments
Compensatory mechanism
Progression

- Smaller fonts, increased duration for reading
- Head turns in gait
- Dynamic standing balance tasks
  - Somatosensory feedback
  - Reaching
  - Head/eye movement
- Sitting driving simulation
- Busy background for visual scanning
  - Grocery store- find soup cans
Outcomes

- Total of 14 weeks, 2x/week initially, then 1x/week
- Returned to work as teacher, with “assistant” teacher
  - Hallways at school still problematic
- Able to read at “functional” speed
  - Much slower than his suspected prior speed
- Saccadic task
  - 1.5 seconds to right, 1 second to left
  - Still very slow but marked improvement
Outcomes

- Balance- “better than before”
  - Static and dynamic
- Functional Gait Assessment (FGA) improved from 18/30 to 28/30
  - Head turns still mildly impaired
- Exercising regularly at gym
- Hopes to drive eventually (?)
Why such success?

- Determination - How can I keep doing what I was doing before?
  - Work, physically active lifestyle
- Positive outlook/ sense of humor
- Discipline to keep doing BORING exercises/tasks
- Supportive wife/kids
Management Considerations

Classes of eye movements
- Saccades
- Smooth pursuit
- Vergence
- Vestibulo-ocular reflex
- Optokinetic system
Compensation vs. recovery?

- Is impairment permanent or has potential for improvement?
- Balanced approach
  - Use of compensatory techniques to help function in the short term
  - Neuromuscular re-education to improve vestibular and/or oculomotor function
- Evidence?
- Be aware of the mechanism that you are employing
Management of Atypical Vestibular Disorders: Beyond BPPV, Vestibular Neuritis, and Acoustic Neuroma

CSM 2014 Las Vegas
Rachel D. Trommelen, PT, DPT, NCS
Laura Morris, PT, NCS
*Janene Holmberg, PT, DPT, NCS

Janene.holmberg@imail.org
Presenting symptom
Bryan, 64 year old

- Slipped and fell hard on ice (landed side/left knee)
- Initially noted only mild knee pain without any acute dizziness or instability
- Over 3 days gradually increasing dizziness/instability to point of vomiting with visit to the Emergency Department (ED) with all serious causes ruled out
  - BPPV suspected, Epley performed
- Day 5: Referred to Audiology for BPPV treatment
Initial Audiology

- Mild geotropic Direction Changing Nystagmus (DCN), left>Right, nystagmus intensity persistent/weak overall
- Treated for possible Left Horizontal or Lateral Canal BPPV (LC-BPPV)
- Day 9: Persistent symptoms of dizziness and instability, off work, continued mild geotropic DCN only mildly symptomatic on the right
- Treated for Right LC-BPPV
VNG
Videonystagmography

- 2 Weeks: Persistent c/o dizziness full VNG completed
- Gaze, Saccade, Smooth Pursuit normal
- Positional testing:
  - Significant Square Wave Jerks some positions with fixation removed only
  - mild (2-3 degrees/second) mixed upbeating/apogeotropictropic direction changing nystagmus that was primarily asymptomatic
- Dix Hallpike and roll testing negative for paroxysmal nystagmus
Audiology Diagnostic (cont.)

- Caloric testing 48% left unilateral vestibular weakness
- 27% directional preponderance to the right

OVERALL INTERPRETATION

- Significant left unilateral hypofunction
- Positional nystagmus non-localizing (central or peripheral)
- Square wave jerks suggestive of CNS dysfunction

Recommendation

- Sent to PT for Vestibular Rehabilitation and monitor/rx BPPV
- MD started prednisone (Dx: Viral Neuritis)
Note on Testing

- **Significance of Positional Nystagmus**
  - >5 degrees/second (strong) or more milder (weak) but in multiple positions can be significant
  - NON-localizing must be viewed with respect to rest of testing

- **Significant Square Wave Jerks**
  - Must be greater than 2/second and present at all times with vision present and independent of position
  - TESTING NOT SIGNIFICANT BY this Definition

- **Significant Caloric Testing and Directional Preponderance**
  - >25-30%
  - TESTING significant for peripheral vestibular hypofunction
Initial PT presentation (2 weeks post)

- Dizziness Handicap Inventory 84/100 (severe)
- Current dizziness 5/10 severity to VAS rating
- Past History significant for
  - Right Total Knee Replacement, skin cancer, sinusitis, allergies, and sleep apnea
  - Life long motion sickness vulnerabilities
- Denies any headache or hearing difficulties
- Some chronic neck stiffness
- Unable to tolerate normal exercise (racquetball)
Initial Testing

- Elevated sway on romberg (more leftward)
- No spontaneous or gaze-evoked (room light and fixation removed)
- Smooth pursuit/saccades normal quality and TOLERANCE
- Positive Head Impulse Testing (HIT) corrective saccades to left
- Positive Dynamic Visual Acuity (DVA): 6 line loss of acuity
- Positive After Head Shake Nystagmus: 6 beats (right)
Initial Testing

- Cervical ROM WNL
- Sitting Vertebral Artery Screen not provocative
- Abnormal Clinical Test for Sensory Interaction on Balance (CTSIB): falls in vestibular conditions (5/6)

Gait:
- reduced velocity, en-bloc maneuvering, frequent wall touch/veer
- Functional Gait Assessment (FGA)=17/30
  - (scores <23 reflect increased fall risk)
Initial Presentation
Initial Assessment

- Negative gaze
- Abnormal/Positive after headshake
- Positional Testing (fixation removed)
  - Some Square Wave (inconsistent)
  - Mildly primarily asymptomatic mixed but primarily right beating NYSTAGMUS esp on left sidelying with some upbeat quality supine (CONSISTENT WITH VNG TESTING)
- Negative Dix Hallpikes; Negative Roll: NO BPPV
- 30% Motion Sensitivity Quotient (Moderate Severity)
  - diffuse generalized motion intolerance without evidence strongly symptomatic paroxysmal nystagmus (i.e. BPPV)
- ASSESSMENT & Exercise Prescription???
Assessment/Recommendation

- Poorly compensated (acute) unilateral vestibular loss with vestibular-specific impairments/disability (HIT, DVA, CTSIB 5/6)

- Acute presentation most consistent with either trauma or co-incident Vestibular Neuritis
  - Can not rule-out initial presentation of an unstable lesion (atypical Meniere’s, remotely Migraine)

- Anticipate 4 follow-up progress adaptation, habituation, sensory balance retraining, and gait retraining

- Home exercise Taught: VOR x1 near and far; grounding; gait with increasing head motions; daily walking
Follow-up one week
(Three weeks post injury)

- Much improved, drove independently to appointment
- Neck still very tight with increasing c/o headache
- Computerized DVA .22 Left .12 Right (normal < .15)
- Gaze Stabilization 115 degrees/sec Left 96 degrees/sec Right
  - values >80 needed to drive
Follow-up one week

- Severe cranial base tightness (light traction relieving)
- Home exercise
  - Cranial base release (2 racquetballs in sock)
  - Gentle cervical ROM and deep neck flexor stabilization
  - Postural retraining out of forward head
  - VOR x1 with narrowed BOS
  - Eyes closed narrowing BOS
  - Hallway gait with increasing head motions
2nd Follow-up (4 weeks injury)

- Horrific week, “stomach-flu” with throwing up, dizziness/vertigo as intense as initial presentation (day 3) that lasted for 3 days (in bed)
- Feels ear fullness w/questionable change hearing but MD confirms stable hearing (day before)
- Severe neck pain/head fullness
- Denies any head ache or migraine history but admits to “lifetime of visual phenomenon that can last for hours”
- Admits to definite light/sound sensitivity during severe exacerbation
Watch his testing today
What did you see

- Severe persistent Apogeotropic Direction Changing Nystagmus in Dix-Hallpike (DH) and Roll testing
  - Some transient almost LT/UB on Left DH
- Supine: Marked Upbeating !!!
- Bow testing: Definite Downbeating nystagmus!!!
- Sitting Flexion Rotation Testing (cervical Torsion testing): apogeotropic as with rolling, negative for cervical influence
- Can BPPV Account for these findings?
Assessment

- Left Posterior Canal BPPV possibly but with severe DCN that can NOT be explained
- Presentation/Disability most supportive or consistent with VESTIBULAR MIGRAINE
- Evidence:
  - Migraine “Travelers” (light/sound sensitivity)
  - Past history of episodic ocular migraines
  - Positional nystagmus NOT accountable with BPPV or peripheral end organ
Management

- Referral to Neurologist
- Trial Treatment for Left Posterior Canal BPPV, unable to assess success (secondary orthotropic burst and/or resolve on final positioning)
- Began Migraine education
  - Power of migraine to create dizziness
  - Migraine conservative treatment strategies (role of diet, exercise, pacing, hydration, etc.)
  - Treatment on hold pending medical stabilization
Power of a Migraine

- Central findings: i.e. impaired smooth pursuit
- Peripheral vestibular asymmetries
  - Some report usually more mild 20-40% (significant Caloric weakness >25%)
- Nystagmus associated with Migraine (Polensek SH Tusa RJ 2010)
- Spontaneous nystagmus: 19%
- Horizontal After headshake: 35%
- Positional nystagmus: 100% (76% sustained and without latency)
  - Direction-changing (50%) Direction Fixed (25%)
  - Up/down beating (10%) or central nystagmus (10%)
  - Torsional (5%)
- Usually at lower amplitude 2-7 degrees/second
  - Nystagmus often dissipates in asymptomatic periods or measured at 1-2 degree per second
Confirmed Migraine placed on gabapentin for prevention/stabilization

Sent to cervical-specific PT x 3 months

Returned to clinic 4 months later

Reporting isn’t floating anymore but still some distinct positional dizziness with looking up, blurry vision, and motion-provoked instability
Reassessment

- Normal velocity and quality of gait
- Normal Romberg but still abnormal CTSIB 5/6
- Negative HIT; Abnormal but improved DVA (3 line loss)
  - Was at 6 line loss
- Cervical ROM without pain
- No spontaneous/gaze-evoked nystagmus
- Positive Afterheadshake testing: left beating x 4
Watch his Eyes now
Reassessment

- Resolved Direction Changing Nystagmus (DCN) supine and on rolling testing
- Abnormal left Dix Hallpike:
  - symptomatic left torsional/upbeating nystagmus of 20 second duration
Assessment

- Significantly improved however with definable
  - L PC BPPV with evidence of successful repositioning
  - Incomplete compensation/healing for L UVL
  - Migraine stabilizing & cervical c/o normalizing

Recommend

- 3-6 Follow-up to stabilize BPPV
- r/o habituation, adaptation, balance retraining on lessening persistent disability
Follow-up

- Significantly better since CRT, but not back to wellness
- Reporting MD increased gabapentin with c/o increased floating/lightheadedness
- Still suboptimal sleep (MD exploring further options)
- Subtle Left beating after headshake (no symptoms)
- Normal Dix-Hallpikes (BPPV in remission)
- Advanced VOR x1 and balance (2 treatment sessions)
- Taught self CRT principals should he experience exacerbation of BPPV
Final Evaluation
Discharge Testing
(8 months post onset)

- Dizziness Handicap Inventory (DHI) 24 versus 84
- VAS severity rating of overall dizziness 3 versus 5
- Reports Only bothersome symptoms remaining
- Back to wellness program (stationary bike, not regular)
Discharge Testing
(8 months post onset)

- Functional Gait Assessment: 29/30 vs 17/30
- Heel toe 30 seconds eyes open 16 eyes closed
- Single leg 30 seconds eyes open and 5-8 seconds eyes closed
- CTSIB normal without abnormal sway, falls, or poor tolerance
- Normal Motion Sensitivity
Final phone contact

- Doing well and exercising 5x/week including racquetball
- Tapering PT for neck with head ache well managed
- Will monitor for exacerbation consistent with BPPV that can’t self manage
- FL-41 sunglasses very helpful
- Understands 3 features of: inner ear hypofunction, BPPV, and Migraine as well as exacerbative cervical factors
Take Home Message

- There is lots of positional nystagmus that has nothing to do with BPPV.
- Just ID and treating BPPV would have been grossly insufficient.
- Just ID and treating the Unilateral deficiency would have been insufficient.
- Management required both stabilizing the lesion and then treating residual impairments:
  - ID evidence for Migraine,
  - Refer for Migraine Consult and medical treatment
  - Treat exacerbative cervicogenic issues
  - ID and treat BPPV
  - Treat Unilateral hypofunction
Wrap-up

Take Home Message

- Atypical cases can be both diagnostic and treatment dilemmas
- Listening to history and subjective c/o are critical to diagnosis
- Initial presentations can fool you
  - continual re-assessments & objective analysis of response to treatment often needed with atypical cases
- Final Diagnosis can sometimes take months
- PT clinical testing vitally important not only to carefully define impairments, disability, and eventual MOST therapeutic customized exercise program BUT also to provide vital evidence for proper diagnosis
Role of PT in atypical cases is often going to be interactive with medical team (neurology, etc.)

With atypical cases, a high degree of skilled & creative customization of exercise progressions is needed, especially where evidence is lacking.

With difficult cases:
- Ask colleagues
- Vestibular SIG resources (NeuroPT.org)
- ID Mentors