



The Dizzy and Imbalanced Patient

Part II: Evaluation

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Note to Participants: There are interactive pop-up questions throughout this lecture. If you choose to pause the lecture and return at a later time, a natural break time would be after answering the interactive questions. (You are able to pause at any time and the presentation will "remember" where you were. It's just a more natural time to pause after the interactive questions.) For your convenience, this outline reflects where/when within the lecture the interactive questions occur.

This lecture has 133 slides and is 106 minutes in duration.

I. Cervicogenic dizziness^{1,2}

- A. Proposed mechanism: cervicogenic dizziness results from a sensory mismatch between somatosensory information from the cervical spine and input from the visual and vestibular systems³
- B. Whiplash injuries^{3,4}
 - 1. Abnormal caloric and rotary chair tests post-whiplash injury^{5,6}
 - 2. Abnormal sensory organization test^{7,8,9}
 - 3. Tympanometric and perilymph fistulas^{6,10}
 - 4. Impaired oculomotor function: smooth pursuit neck torsion test (SPNT)^{11,12}
 - 5. Impaired muscle function^{13,14}
 - 6. Impaired cervical somatosensation: increased joint position error (JPE)¹⁵⁻¹⁸
- C. Conclusions? It seems clear that patients with persistent symptoms after a whiplash injury should be evaluated for:
 - 1. Vestibular abnormalities, both central and peripheral
 - 2. Smooth pursuit accuracy
 - 3. Postural control
 - 4. Neck muscle function, including strength *and* endurance, flexors and extensors
 - 5. Head-neck repositioning

II. Migrainous vertigo¹⁹⁻²²

- A. Cervicogenic dizziness implies there is a problem in the cervical spine causing the dizzy symptoms
 - 1. These impairments can cause other symptoms: HEADACHES! NECK PAIN!
 - 2. Wrisley (2000) states neck pain is a pre-requisite for the diagnosis³

Notes

B. How does one differentiate between Cx dizziness and migrainous vertigo?

1. Presence of aura, photophobia, phonophobia

III. Recognizing central, peripheral and cervicogenic dizziness

A. Character of dizziness^{23, 24}

1. Fainting or lightheadedness:
 - a) Pre-syncope: think vascular
 - b) Test for orthostatic hypotension!
2. Spinning, think vertigo: peripheral vestibular?
3. Dizzy or imbalance?
4. Double vision?
 - a) Think new glasses (simplest)
 - b) Consider oscillopsia: VOR (vestibular)
5. Associated aura, photophobia? migraine

B. Differential diagnosis²³

1. Central
 - a) Oculo-motor tests
 - b) Resting nystagmus; abnormal smooth pursuit, saccades, etc.
 - c) Signs of CNS disorder
 - d) e.g., UMN signs
 - e) Constant vertigo
2. Peripheral
 - a) No resting nystagmus (unless acute)
 - b) Position/movement provoked
 - c) Good smooth pursuit
 - d) No UMN signs
 - e) Transient dizziness
 - f) Positive passive head shake, head thrust, etc.

C. Summary: key history in cervicogenic dizziness

1. Concurrent complaint of neck pain
 - a) Temporally related onset
 - b) Pain and dizziness severity co-vary
2. Vague description, but NOT true vertigo (i.e., not spinning)
3. Short duration, or movement provoked
 - a) Could be constant low-grade sensation or feeling: "off," "floating," etc.
4. Imbalance or postural dyscontrol

D. Time course of dizziness

Duration	Etiology
Seconds	BPPV, Perilymph fistula, Orthostatic hypotension, CGD
Minutes	TIA, Migraines
Hours/ Days	Menière's, Acute vestibulopathy (UVL)

Interactive Questions: Slide 43 @ 30 minutes

IV. Examination of the patient with dizziness²⁵⁻²⁷

Notes

- A. Working assumption: from here forward, we will assume that along with the dizziness:
1. The patient's symptom onset was associated with a traumatic event, and
 2. The therapist is the first contact the patient has with the healthcare system
 - a) Thus, for this course the therapist must decide if the patient is appropriate for therapy or needs a referral
- B. Examination sequence
1. Appropriate for therapy?²⁸
 - a) History of trauma: rule out upper cervical hypermobility (ligamentous laxity tests: sharp-purser, alar ligament tests)²⁹, fractures (open mouth x-ray minimum)
 - b) VBI. significant problems associated with extension-rotation test; usefulness in predicting who is at risk is limited. Any questions: refer^{30, 31 32}
 2. Central versus peripheral vestibular dysfunction (see above for history)
 - a) New unexplained onset of central causes, or changing central signs, are a red flag: refer
 - b) Central: Oculomotor exam, upper motor neuron (UMN) signs
 - i. Oculomotor exam: spontaneous nystagmus persisting >1 week after onset, saccadic (jerky) smooth pursuit, abnormal saccades (overshoot or >2 eye movements to target)
 - ii. Signs of UMN lesion: hyperreflexia, hypertonia, ataxia, etc.
 - c) Peripheral:
 - i. Hallpike: nystagmus with position change suggests BPPV
 - 1) Posterior canal: upbeating; anterior canal: downbeating
 - 2) If true BPPV will have rotary component to the involved side
 - 3) Canalithiasis: short duration; cupulolithiasis: >1 minute duration

- ii. Roll test: horizontal canal BPPV
 - 1) Supine head rotation to each side; positive is horizontal nystagmus
 - 2) Nystagmus towards the ground (geotropic): canalithiasis
 - 3) Nystagmus away from the ground (ageotropic): cupulolithiasis

Interactive Questions: Slide 94 @ 71 minutes

- iii. Head thrust: vestibular hypofunction; corrective saccade when head is suddenly moved (thrust) to the involved side
- iv. Post-head shake nystagmus: unilateral vestibular hypofunction
- v. Dynamic visual acuity (DVA) test: clinical measure of VOR

Interactive Questions: Slide 110 @ 81 minutes

- 3. Cervical spine: cervicogenic dizziness is a diagnosis of exclusion
 - a) Reduction of symptoms with manual cervical traction: cervicogenic
- 4. Lightheaded upon rising from supine or sitting? Check for orthostatic hypotension
- 5. With a history of trauma (e.g., whiplash), central (brain injury), peripheral and cervical causes of dizziness can all be present simultaneously
- 6. Mechanical differential diagnosis: modified neck torsion nystagmus test
 - a) Move body under head: reproduction of symptoms suggests cervical involvement
 - b) Move head and neck together as one unit (en bloc): reproduction of symptoms suggests central or peripheral vestibular involvement
 - c) Must do both to get the full picture

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