Teaching Rounds – Dizziness, Vertigo and Hearing Loss – University of Connecticut

1. A 76-year-old woman presents to your office for acute onset of dizziness after rolling over in bed. She tells you that she turned to the right to adjust her pillow and experienced acute onset of nausea, a “spinning sensation” and had to suppress an urge to vomit. She lay there for about 30 seconds and the symptoms subsided to some extent. On examination, she is afebrile with normal vital signs. Her extra-ocular muscle movements are normal except for mild end-beat nystagmus on right lateral gaze. When a Dix-Hallpike maneuver is performed rolling her head to the right, her symptoms are reproduced. Repetition of this maneuver results in symptoms reduction with each subsequent maneuver. [Diagnosis: Benign Positional Vertigo]

   a. Discuss the differences between “central” and “peripheral” vertigo
   b. Discuss nystagmus including the slow and fast components
   c. Discuss the Dix-Hallpike maneuver
   d. Discuss why peripheral vertigo fatigues and central vertigo does not
   e. Discuss the most likely diagnosis and its pathophysiology
   f. Discuss the Epley maneuver and how it treats this problem
   g. Discuss her prognosis

2. A 33-year-old air traffic controller presents to your clinic with a 3 year history of right ear fullness accompanied by a constant “roaring sound” in that ear. She also reports that she has episodes of acute onset of nausea and “dizziness”. When questioned, she states that her dizziness is like being on a ship that is “heaving to and fro.” These episodes occur several times per day for 2 weeks and then resolve for one to two months. She also notes that it is becoming more difficult to understand radio transmissions from male pilots whereas she hears female pilots without difficulty. At first she thought it was her headset but then she noted that she was asking her husband to repeat himself quite often. Her examination is remarkable for a Weber test that lateralizes to the left ear. Rinne testing demonstrates that air conduction is superior to bone conduction bilaterally. Watch tick perception is equal in both ears but the finger rub perception is decreased on the right ear. The remainder of the neurological examination is unremarkable. [Diagnosis: Meniere’s Disease]

   a. Discuss why the pathology is in the peripheral nervous system
   b. Discuss the structures comprising the outer, middle and inner ear
   c. Discuss sensorineural and conductive type of hearing losses
   d. Discuss the difference between watch tick and finger rub testing
   e. Discuss the Weber and Rinne tests as noted in the appended table
   f. Discuss the likely diagnosis and its pathophysiology
   g. Discuss the various treatment options available for this condition
### TABLE OF WEBER AND RINNE TESTING:

<table>
<thead>
<tr>
<th>Rinne Both Ears AC&gt;BC</th>
<th>Weber without lateralization</th>
<th>Weber lateralizes left</th>
<th>Weber lateralizes right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Sensorineural loss in right</td>
<td>Sensorineural loss in left</td>
<td></td>
</tr>
<tr>
<td>Rinne Left BC&gt;AC</td>
<td>Conductive loss in left</td>
<td>Combined loss: conductive and sensorineural loss in left</td>
<td></td>
</tr>
<tr>
<td>Rinne Right BC&gt;AC</td>
<td>Combined loss: conductive and sensorineural loss in right</td>
<td>Conductive loss in right</td>
<td></td>
</tr>
</tbody>
</table>

3. A 63-year-old man presents to your clinic with a 5 year history of progressive hearing loss in his left ear. He states that he first noted that he had difficulty speaking to his wife and daughters over the telephone such that he always had to use his right ear. Over the past 2 years, he reported intermittent “spinning sensations” and difficulty walking a straight line. Although he was a teetotaler, he was often asked if he had been drinking. At first, he attributed this hearing loss to the normal effects of aging. However, he became concerned when his wife pointed out that the left side of his face was “drooping” when compared to the right. His general physical examination is unremarkable except for a Weber test that lateralizes to the right ear. Rinne test demonstrates air conduction greater than bone conduction bilaterally. Neurological examination is remarkable for a mild left infranuclear facial weakness. Extraocular movements are normal. The left corneal blink reflex is diminished when compared to the right. Taste sensation is equal on both sides of his tongue. He has mild dysmetria on left finger to nose testing. He has a wide based gait with a negative Romberg. He is unable to tandem walk. [Diagnosis: Acoustic neuroma]

- a. Discuss lesion localization based on his signs and symptoms
- b. Discuss why it was important to test taste sensation
- c. Discuss the most likely diagnosis and its pathophysiology
- d. Discuss diagnostic testing including imaging and evoked potentials
- e. Discuss the implications if bilateral acoustic neuromas were noted (e.g. Neurofibromatosis type II)
- f. Discuss the various treatment options available for this condition
4. A 55-year-old man presents with a 4 month history of worsening “dizziness”. He states that he is no longer able to sit upright or walk without listing from side to side. He also reports that he has been awakening with severe headaches every morning that result in nausea and vomiting. He has been so unsteady that he has had to have his life partner lift him out of the bathtub and assist him with dressing. He and his male partner have been living together monogamously for the past 25 years. He denies any illicit drug use but admits to consuming a liter of vodka per day for the past 10 years. He also denies any vision change, dysphagia, dysarthria, motor weakness, sensory loss or incontinence. His general physical examination is unremarkable. His neurological examination is remarkable for truncal instability so severe that he is unable to sit upright. However, no dysmetria is noted on finger to nose or heel to shin testing. No abnormal eye movements are noted. [Diagnosis: Alcoholic cerebellar degeneration]

   a. Discuss the importance of being non-judgmental (e.g. his lifestyle)
   b. Discuss why HIV infection is an unlikely diagnosis
   c. Discuss why the cerebellum is the pathological site
   d. Discuss the archicerebellum, paleocerebellum and neocerebellum
   e. Discuss which structures are likely involved.
   f. Discuss the differential diagnosis
   g. Discuss the evaluation of these diagnoses
   h. Discuss the treatment options available for this patient

5. A 60-year-old woman presents with a two month history of progressive ataxia. She reports that she is unable to focus on any objects because her eyes keep “bobbing up and down”. She has become progressively unsteady on her feet such that she needs a cane to ambulate. She also reports difficulty swallowing as if she will “choke on her food.” Because of her dysphagia, she has lost 10 pounds over the last month. She also reports that her speech has changed such that she sounds as if she is “chanting her words.” Her primary care physician ordered an MRI of the brain that was unremarkable. She denies the use of tobacco, alcohol or illicit drugs. Her general physical examination is unremarkable. The OB/GYN consultant reported an unremarkable breast and pelvic examination. Her neurological examination is remarkable for scanning speech and downbeat nystagmus. Dysmetria is also noted on finger to nose or heel to shin testing bilaterally. She is unable to ambulate without assistance as she manifests severe truncal ataxia. Her Romberg test is equivocal. [Diagnosis: anti-Yo paraneoplastic cerebellitis]

   a. Discuss why the cerebellum is the pathological site
   b. Discuss the findings of “scanning speech” and downbeat nystagmus
   c. Discuss which parts of the cerebellum are involved
   d. Discuss the differential diagnosis
   e. Discuss how you assess your diagnosis
   f. Discuss that paraneoplastic syndromes may precede tumor detection
   g. Discuss the treatment options available
   h. Discuss that tumor removal may not affect her neurological disorder