Dizziness and Acoustic Neuroma

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What is a Neurotologist?

- Otolaryngologist (ENT) by residency training.

- 2 year fellowship in Neurotology/Skull Base Surgery

- In sum: the E in ENT
Agenda

- Definitions
- Primer on dizziness
- Acoustic Neuroma
- Primer on management
Dizziness

- 5-10% of population suffer from it
- 40% of individuals over age 40 years have it
- 3.9 million visits to emergency rooms in U.S. for dizziness (2011)
- 5.4% of visits to ER are due to “serious diagnoses.”
When Should You Image?

When Should You Refer?
Predictors of Serious Diagnoses

- Focal examination findings
- Age over 60 years
- Imbalance as symptom
What Do You Need To Be Right?

- Knowledge
- Time
- Attention
Definition

- Dizziness
  - Imbalance

- Vertigo

- Lightheadedness
Initial Work Up

- Characterize “dizziness”

- Gradual or sudden

- Intermittent or constant

- Associated symptoms
Associated Symptoms

- Tinnitus
- Hearing loss
- Ear fullness
- Visual Symptoms
- Ear drainage
Physical Examination

- How does the patient look when they walk into the room?
- Look in their ears
- Look at their eyes
Old Stand By
Office Maneuvers To Help Dx
Relevance of Nystagmus

- Fast component points toward stronger side
- Vertical nystagmus confirms central etiology
- Not possible to fake
Common Causes of Dizziness

- Benign Paroxysmal Positional Vertigo (BPPV)
- Vestibular Migraines
- Meniere’s Disease
- Vestibular Neuritis
Epley Maneuver
Vestibular Migraines

- 5 vestibular episodes of moderate to severe severity lasting 5 minutes to 72 hours
- Current or previous history of migraine
- One or more of the following accompanying 50% of episodes
  - Headache
  - Phonophobia or photophobia
  - Visual aura
- Not better accounted for by another vestibular or ICHD diagnosis

Cephalagia 33 (9): 629-808
Meniere’s Disease

- 2 or more episodes of spontaneous vertigo lasting 20 minutes to 12 hours
- Hearing loss
- Tinnitus
- Aural Fullness

Monsell EM, Otolaryngol Head Neck Surg 1995
Vestibular Neuritis

- Acute peripheral vestibular loss from vestibular nerve hypofunction
- Acute rotary vertigo that transitions to imbalance
- Hallmark:
  - Horizontal nystagmus
  - Suggestive history
  - No auditory symptoms
Vestibular Neuritis

- Treatment is regular ambulation and mobilization

- Possible role for corticosteroids of detected early.
Predictors of Serious Diagnoses

- Focal examination findings
- Age over 60 years
- Imbalance as symptom
Acoustic Neuroma

- Comprises 80% of all cerebellopontine angle tumors.
- Incidence is 1-2 per 100,000
Acoustic Neuroma

Symptoms Present at time of Diagnosis Meta-Analysis

- Hearing Loss
- Tinnitus
- Headache
- Balance Disturbance
- Facial Weakness
- Facial Numbness
- Lower CN Palsy

Graph showing percentages of symptoms present at diagnosis.
Clues to Acoustic Neuroma Diagnosis

- Symptoms refer to one side
  - Hearing
  - Tinnitus
  - Imbalance
- Vertigo rare
How To Diagnose?
How to Diagnose?

- MRI of Internal Auditory Canal and Brain with and without Gadolinium

- What about a CT?
  - Only show large tumors
Do They Need Contrast?
Now What?

- Refer
  - Neurotologist
  - Neurosurgeon

- But . . .
  - How do we address this?
It’s Complicated
Ways to Treat Acoustic Neuroma

- Do Nothing
- Surgery
- Radiation
What Goes In Determining Treatment

- Tumor Size
Hearing Status
Speech Discrimination

- Poor speech discrimination is indicative of retrocochlear pathology
What About Dizziness?

- None of the Treatment Modalities Alter Balance
- Vestibular Rehabilitation
Watchful Waiting

- Repeat MRI in 6 months
- If no change, repeat yearly
54.5% showed no growth.
7.8% showed slow growth.
1.3% showed fast growth.
87% showed favorable patterns for watchful waiting.
Outcomes

- Serial Imaging:
  - 22.3% needed change in treatment approach in 12 years.
  - 24.3% had decline in hearing to non-serviceable levels.
  - Imbalance and Dysequilibrium at presentation presented almost 3 fold increase in likelihood of tumor growth.

Watchful Waiting

- Facial nerve sequela very rare.

- Progressive imbalance that responds to vestibular rehabilitation.
Surgery

- Hearing Preservation
- Hearing Sacrificing
Outcomes

- Surgery
Hearing

- Dependent on preoperative levels
  - Up to 80% retain useful hearing if hearing preservation approach used.

- Dependent on surgical approach
Balance

- Mild increase in dizziness when measured using the dizziness handicap index (DHI) at 6 months after surgery.

Thomeer et al., Otol Neurotol 2015
Priorities of Surgery

- Safe delivery from surgery
- Complete or near complete excision of tumor
- Facial nerve function
- Hearing improvement
Radiosurgery
Radiosurgery

- Objective of this treatment
  - Prevent further growth

- Success is defined as not needing further management
Gamma Knife Radiosurgery
Radiosurgery

- Outcomes
  - Over 90% tumor control

- Hearing preservation-
  - 89.7% at 1 year
  - 84.7% at 3 years
  - 76.5% at 5 years,
  - 68.6% at 10 years.

Combs SE et al., Radiother Oncol 2013
Radiosurgery

- Outcomes
  - Facial nerve control-96.2% (Yang et al., Neurooncol 2009).
  - Dizziness
What’s The Right Answer For Me?

- It’s Complicated
- Treatment modality does determine QoL.
- Diagnosis biggest detriment to QoL.
Biggest Detriments to Diagnosis/Treatment

- Dizziness
- Headache
Questions?