Case Studies in Dizziness and Hearing Loss

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Learning Objectives

• Implement efficient treatment strategies for varying types of hearing loss
• Understand variety in presentations of Meniere’s disease
• Identify alternate form of dysequilibrium
• Differentiate types of tinnitus and initiate appropriate workup
Audiometry

- < right bone conduction
- >Left bone conduction
- circle right air conduction
- x left air conduction
Audiometry
Case #1

- 56 y/o man who returned from business trip overseas 2 days ago and complains of right aural fullness, right sided hearing loss, feeling of inability to “pop” ear since his return
- PMH: HTN    PSH: Inguinal hernia
- Meds: HCTZ    Allg: NKDA
- Soc hx: nonsmoker, nondrinker. Travels extensively and has never had this happen before.

Case #1

- Left ear: canal and TM appear normal with normal mobility
- Right ear: see photo
- You think you see a serous effusion, but aren’t certain
Case #1

• What can you do to help decide by physical exam whether there is a middle ear effusion? (may be multiple answers)
• A. Autoinsufflation
• B. Tilt chair or patient’s head to see if the fluid level moves
• C. Pneumatic otoscopy
• D. Have patient hold nose and swallow
• E. Weber and Rinne
Management of acute serous otitis media

- A. Repeat examination in 3 weeks
- B. Oral antibiotics x 3 weeks and repeat examination
- C. Antibiotic otic drops
- D. Urgent referral to ENT
- E. Oral steroids
Acute Serous Otitis Media

• Due to eustachian tube dysfunction
• Treatments suggested:
  – Oral steroids
  – Topical nasal steroids
  – Oral antibiotics
  – Antihistamines/decongestants
  – Mucolytics
  – Autoinsufflation
• No definitive evidence to recommend any in adults
3 weeks later…

Now what?

- A. Continue observation since no evidence of infection has developed
- B. Refer to ENT
- C. Now give oral antibiotics
- D. CT scan
Surgical Mgmt of Serous Otitis Media

- Tympanocentesis
- Myringotomy
- Myringotomy with tympanostomy tube placement
- **Must examine nasopharynx

Case #2

- 35 y/o woman who was driving down from mountains 2 days ago. She noticed that she couldn’t hear well from right ear when she returned home. Complains of aural fullness, muffled hearing like in a barrel, inability to “pop” ear.
- She did have nasal congestion, runny nose, mild URI while on her trip that has been getting a little better.
• PMH: HTN
• PSH: Hysterectomy
• Meds: HCTZ, Lisinopril
• Allg: NKDA
• Social hx: nonsmoker, nondrinker, in and out of mountains frequently with no prior trouble with ears/altitude

Case #2
Case #2

- Weber: left
- Rinne: AC>BC bilaterally though right ear hearing is subjectively less than left
- Pneumatic otoscopy normal

Possibilities?

- A. Eustachian tube dysfunction without effusion
- B. Small effusion that you cannot see well
- C. Otosclerosis
- D. Factitious disorder
- E. Other
What to do?

- A. Observation and repeat examination in 3 weeks
- B. Oral antibiotics x 3 weeks and repeat examination
- C. Antibiotic otic drops
- D. Urgent referral to ENT
- E. Nasal steroids

Why?

- Sudden sensorineural hearing loss
Sudden SNHL

• Defined causes – uncommon
  – Infection – bacterial meningitis, labyrinthitis, syphilis, mumps, CMV
  – Inflammation – autoimmune, MS
  – Trauma – T bone fracture, acoustic trauma
  – Tumor – CPA tumor, metastasis
  – Ototoxicity – aspirin, aminoglycosides
  – Vascular – thromboembolism, sickle cell dz

Idiopathic sudden SNHL

• 5-20 cases per 100,000
• Theories →
  • Viral
  • Vascular compromise
  • Intracochlear membrane rupture
  • [[Immune inner ear disease]]
Management?

- A. Observation
- **B. Oral steroids**
- C. Oral antibiotics
- D. Stat MRI of brain and internal auditory canals prior to treatment

Management of Sudden SNHL

- Some evidence for oral steroid usage
  - Common dosing starts at 60 mg prednisone
- Transtympanic steroid injection (good for patients intolerant to oral steroids or failures)
- Little to no evidence for antivirals, vasodilators, anticoagulants
- Poor consensus on treatment algorithm
Case #3

- 40 y/o man with left sided hearing loss that seems to fluctuate
- He gets feeling of imbalance (described as feeling “off”) that also comes and goes, sometimes during hearing loss and sometimes without
- Has never had an episode of true spinning sensation
- PMH/PSH: none
- Meds: none
- Soc hx: nonsmoker, occasional alcohol only
Case #3b

- 51 year old woman who noted sensation of her right ear ‘being blocked’ this AM.
- Now has ringing and decreased hearing
- The room then began to spin wildly
- She became sweaty, nauseated and vomited once
- The spinning lasted about 60 minutes, then abated
- She now has a sensation of residual dysequilibrium several hours later

Case #3b Audiometry
Case 3c

- 50 y/o woman suddenly feels overwhelming tilting sensation, feels her legs become rigid and abruptly falls to the ground.
- Recovers to normal after a few seconds.
- Prior history at age 43 of single episode of tinnitus with dizziness lasting several hours with complete resolution.

Same diagnosis?

- True
- False

True

All fall within diagnostic criteria for Meniere’s disease.
Endolymphatic space

Definite Meniere’s

- Two or more definitive spontaneous episodes of vertigo 20 minutes or longer
- Audiometrically documented hearing loss on at least one occasion
- Tinnitus or aural fullness in the treated ear
- Other causes excluded
Probable Meniere’s

- One definitive episode of vertigo
- Audiometrically documented hearing loss on at least one occasion
- Tinnitus or aural fullness in the treated ear
- Other causes excluded

Possible Meniere’s

- Episodic vertigo of the Meniere's type without documented hearing loss, or
- Sensorineural hearing loss, fluctuating or fixed, with dysequilibrium but without definitive episodes
- Other causes excluded
Diagnostic Criteria: Meniere's Disease

- Certain Meniere's disease
- Definite Meniere's disease, plus histopathologic confirmation of endolymphatic hydrops
Crisis of Tumarkin

- “Drop Attacks”
- Acute deformation of otolithic organs of vestibular system (utricle and saccule)
- Rare manifestation of Meniere’s disease
- Patients more likely to undergo vestibular ablation

Which of the following would be used to manage Meniere’s disease?

- A. Low salt diet
- B. Dyazide diuretic
- C. Vestibular suppressant
- D. Stress reduction
- E. All of the above
Surgical Management

- Transtympanic gentamicin
- Labyrinthectomy
- Endolymphatic shunt
- Vestibular nerve sectioning

Case 4

- 25 y/o MA in your office was having water balloon fight with family over weekend and got hit in right ear with water balloon
- Noticed afterward that right ear felt full, hearing muffled, couldn’t pop ear
- No vertigo
- No ear drainage or bleeding
- Otherwise healthy
What would you recommend?

- A. Reassurance
- B. Otic drops to prevent drainage
- C. Oral antibiotics to prevent infection
- D. Irrigate ear
- E. Stat ENT referral
Traumatic TM perforation

- Unknown incidence
- Caused by blow to head (often directly to ear), change in pressure from explosion, change in pressure in divers, penetrating trauma (Q tips!)
- Up to 95% spontaneously heal (usually within 12 weeks, most sooner)

Initial Treatment

- No prophylactic treatment needed
- Avoid cleaning/instrumentation
- DRY EAR PRECAUTIONS!
What should you do?

- A. Amoxicillin
- B. Ofloxacin otic drops
- C. Cortisporin otic drops (neomycin, polymixin B, hydrocortisone)
- D. Irrigate ear

Otorrhea with TM perforation

- Otic drops – would avoid aminoglycoside
- Keep ear dry
- Usually don’t need oral antibiotics
- May decrease chances of spontaneous healing
Healed?

Case 5

- 53 y/o woman returns from 3 day sailing excursion
- Approximately 1 hour after return, she began to feel constant sensation of “bobbing”
- Has persisted for the past 6 weeks
- No falls
- Mild nausea, no hearing changes or tinnitus
- “Brain feels foggy”
Examination

- Normal ear exam
- Negative dix hallpike
- No nystagmus with any maneuvers
- Normal hearing

Diagnosis?

- A. Motion sickness
- B. Vestibular neuronitis
- C. Mal de Debarquement
- D. Labyrinthitis
- E. Psychogenic disorder
Mal de Débarquement

- Inappropriate sensations of movement after exposure to motion
- Symptom free during periods of motion and return to motion can relieve symptoms
- Can be prolonged – up to 10 years
- Unknown etiology
- Possible association with migraine, possible hormonal etiology
- CNS maladaptation
Treatment

- Vestibular rehabilitation
- Vestibular suppressants (benzodiazepenes may be more effective)
- Avoidance of further prolonged exposure to rocking motion

Case 6

- 72 y/o man reports ringing sound in both ears over the past 6 months
- Fairly constant though seems to fluctuate in volume sometimes
- Denies hearing loss
- No vertigo, ear pain, aural fullness, ear drainage, infections
- Thinks his father had hearing loss, but that was only according to his mother
AUDIOGRAM
High frequency sensorineural hearing loss
Audiometric pattern/history most consistent with?

- A. Presbycusis
- B. Meniere’s disease
- C. Autoimmune hearing loss
- D. Congenital hearing loss

Tinnitus

- Everyone has experienced tinnitus at some point
- Estimated 10-12 million have troubling symptoms
- More prevalent in older people
- Ringing, buzzing, whirring, hissing
- Majority is subjective
Tinnitus is most commonly associated with:

- A. Medication toxicity
- B. Hearing loss
- C. Brain abnormalities
- D. Ear infections
- E. Dizziness

Which of the following is a treatment option for tinnitus?

- A. Hearing aids
- B. Masking
- C. Tinnitus retraining
- D. Cognitive behavioral therapy
- E. Antidepressants
- F. Accupuncture
- G. Group therapy
Which of the following are proven effective for tinnitus?

- Hearing aids
- Masking
- Tinnitus retraining
- Cognitive behavioral therapy
- Antidepressants
- Support groups

Resources

- American Tinnitus Association ➔ www.ata.org
- http://www.entnet.org/HealthInformation/tinnitus.cfm = American Academy of Otolaryngology Head and Neck Surgery
Tinnitus

- Bilateral constant tinnitus with normal hearing
  - Rarely due to underlying identifiable/concerning pathology
  - Difficult to treat

Case #6b

- 72 y/o man reports ringing sound in both ears over the past 6 months
- Fairly constant and seems to be in sync with his pulse
- Denies hearing loss
- No vertigo, ear pain, aural fullness, ear drainage, infections
- Thinks his father had hearing loss, but that was only according to his mother
AUDIOPGRAM
High frequency sensorineural hearing loss
“sync with his pulse”

- Pulsatile tinnitus
- Can be same sound as nonpulsatile tinnitus but follows pulsating pattern
- In sync with patient’s heartbeat
- May be unilateral or bilateral – may indicate different etiology

What test would be most useful?

- A. Carotid doppler
- B. CT head
- C. Brain angiogram via interventional radiology
- D. CT neck with contrast
- E. MRI brain/skullbase with MRA/MRV
Pulsatile tinnitus

• Vascular abnormalities
  – AV shunt
  – AV malformations
  – Acquired AV shunts – paragangliomas
  – Arterial bruits – aberrant carotid position, dehiscent carotid, transmitted from cervical carotid
  – Venous hums – HTN, high jugular bulb
High riding, dehiscent jugular bulb
Glomus tympanicum

Glomus jugulare
Others

- Palatal Myoclonus
- Idiopathic stapedial muscle/tensor tympani muscle spasm

Unilateral tinnitus
Unilateral tinnitus with unilateral hearing loss

- A. No further workup
- B. CT temporal bones
- C. MRI brain
- D. MRI skull base/IAC
- E. Angiography

Vestibular schwannoma
Vestibular schwannoma

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Questions?

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