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Tinnitus Evaluation & Management: Grand Rounds

The University of Mississippi Medical Center

Department of Otolaryngology-Head and Neck Surgery

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- **Presenter Disclosures**: Christopher Spankovich: Financial: Christopher Spankovich is employed by the University of Mississippi Medical Center. He has participated in research in the area of hearing loss and tinnitus. Non-financial: Christopher Spankovich has no relevant non-financial relationships to disclose. Thomas Eby: Financial: Thomas Eby is employed by the University of Mississippi Medical Center. Non-financial: Thomas Eby has no relevant non-financial relationships to disclose. Victoria Gonzalez: Financial: Victoria Gonzalez is employed by the University of Mississippi Medical Center. Non-financial: Victoria Gonzalez has no relevant non-financial relationships to disclose. Charles Bishop: Financial: Charles Bishop is employed by the University of Mississippi Medical Center. Non-financial: Charles Bishop has no relevant non-financial relationships to disclose. Alex Elkins: Financial: Alex Elkins is employed by the University of Mississippi Medical Center. Non-financial: Alex Elkins has no relevant non-financial relationships to disclose. AudiologyOnline has made a donation on behalf of all presenters to the University of Mississippi Medical Center for this presentation.
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Learning Outcomes

After this course, participants will be able to:

- Discuss types of tinnitus and recommended nomenclature.
- Identify various applications of technology to tinnitus management.
- Describe different management strategies for tinnitus

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Introduction

- University of Mississippi Medical Center (UMMC)
  - Only academic medical center in the state of Mississippi
  - Located in Jackson, MS
  - Contains 7 Health Science Schools: Medicine, Dentistry, Health Related Professions, Graduate Studies, Population Health, and Pharmacy
  - The first lung transplant and first heart transplant

CONTINUED THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

Introduction

- Department of Otolaryngology-Head and Neck Surgery
  - 14 Audiologist
  - 13 Otolaryngologist
    - 1 Otologist/Neuro-otologist (Eby)
  - Strong NIH Funding Record
    - Auditory and Vestibular Neuroscience

CONTINUED THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

UMMC Tinnitus Approach

- Holistic, Flexible, Collaborative
  - History
    - Chief complaint
    - Tinnitus type: Primary vs. Secondary
    - Onset, Correlations, Symptoms
  - Tinnitus Evaluation
    - Medical
    - Audiological
  - Tinnitus Management
    - Counseling
    - Sound based therapy
    - Pharmacological/Surgical

Q1, 9

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Speakers Today

- Christopher Spankovich, AuD, PhD, MPH
- Charles Bishop, AuD, PhD
- Victoria Gonzalez, AuD, PhD
- Thomas Eby, MD
- Alex Elkins, AuD

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Tinnitus Habituation Therapy in a Patient with SSD Secondary to VIIIth Nerve Resection

Charles E. Bishop, AuD, PhD

Assisted by: Lauren Langan, BS and Ashleigh Harrison, BS
Audiology Graduate Externs

CONTINUED

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Questions:

- What is tinnitus habituation/retraining therapy?
- How is this done for a patient with SSD?
- What additional concerns arise with VIIIth nerve resection as opposed to intact VIIIth nerve?
- What can this tell us about tinnitus habituation, and how does this play into cognitive behavioral and mindfulness therapies for other disorders?

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Learning Outcomes

After this course, participants will be able to:

- Describe the basic components of tinnitus habituation therapy
- Describe the use of sound therapy (amplification and/or noise generator(s) as an elective aspect of tinnitus habituation therapy
- Apply the basic principles of tinnitus habituation therapy to individuals with SSD, with or without VIIIth nerve function

CONTINUED

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Case: History

- 30-year-old healthy male
- Prior history of left sided VIIIth nerve resection for treatment of vestibular schwannoma (acoustic neuroma). This was performed at an outside clinic. No other information available on tumor size and/or location.
- Patient reported complete loss of hearing on the left side following surgery 1 year prior to being seen in our clinic.
- Primary concerns were:

1) Bothersome complex roaring/ringing tinnitus
2) Hearing loss (impaired localization and hearing in noise—additional problems hearing TV and communicating in the home with certain people… hearing in the car is "impossible")

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Case: History

- According to patient: Prior hearing tests revealed "complete" deafness of the left ear. Normal hearing on the right.
- No prior treatments of tinnitus or hearing loss. Was told "Nothing can be done about it…"
- Patient independently contacted our center for assistance.
- Reported some residual "unsteadiness" but not true vertigo
- Reported left, persistent, aural fullness

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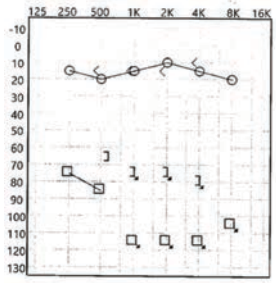
Case: Assessment

- Otoscopy unremarkable
- Pure-tone audiometry:
  - Normal Hearing on the Right
  - Profound Sensorineural Hearing Loss on the left



- SRT/PTA agreement Good
- Vibrotactile Responses Observed in Low Frequencies
- Word Recognition Score (WRS)
  - Right Ear: 100% at 65 dB HL
  - Left Ear: No Response

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Case: Assessment

- Otoacoustic Emissions (DPOAEs)
  - Right: Present and robust
  - Left: Absent
- Tinnitus Handicap Inventory (THI)
  - Score= 58 (Severe: Almost always heard, leads to disturbed sleep patterns, interferes with daily activities)
- Tinnitus Evaluation
  - Pitch Match n/a (complex tinnitus)
  - Minimum masking level (MML): BBN, 40 dB HL in right ear
  - Patient tries to mask tinnitus with bedside noise generator (white noise on digital alarm clock) “It helps but sleep is not good”

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Case: Treatment

- Directive Counseling
  - Goal: De-mystify tinnitus percept
    - Review audiogram
    - Neurophysiological model of tinnitus (how tinnitus is related to hearing impairment, how it is perceived and amplified in the brain and how attention to tinnitus exacerbates the percept)
    - Mindfulness counseling to reduce…
      - Over-evaluation of tinnitus characteristics
        - Ex: Good day/bad day, loud, soft, changing…
      - Catastrophic thinking
        - "My life will never be the same…" "I guess I'm going deaf…" "What if my tinnitus gets louder and louder…?"

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Case: Treatment

- Sound Therapy
  - General Hearing Instruments (GHI)
    - On-the-Ear (OTE) open fit noise generator
    - Selectable white noise and pink noise
    - Volume control
- Set to the "Mixing Point" (noise and tinnitus can be heard as nearly equal)
- Potential Goals:
  - Reduce contrast between loud and quiet environments
  - Tinnitus percept suppression

CONTINUED

Case: Treatment

- Outcome
  - Continued use of GHI noise generator after 1 year
  - Patient reported that he feels more acceptance of the tinnitus and he is less distracted by it. The noise generator helps "soothe" the tinnitus percept
  - He still "hears" the tinnitus and he feels it still affects his life negatively
  - Sleep is the same but has begun using medicinal sleep aid (Ambien)
  - THI score stepped down one category, from 58 to 40 (Severe to Moderate, which is noticed in the presence of background noise, although daily activities can still be performed)

Case: Discussion

- Tinnitus habituation/retraining therapy is helpful in patients with unilateral impairments and/or VIIIth nerve resection. However—outcome is guarded (ex: THI reduced only from Severe to Moderate)
- Noise/sound therapy can be effective on the good/better ear, despite complete deafness on the impaired/worse side
- Sound therapy is best used in conjunction with Directive Counseling
- However….

Case: Discussion

- This case is approximately 10 years old.
- Question: What technology is available now that might help this patient?
  - Wireless CROS/BiCROS hearing aids using a true open canal fitting approach
  - Devices with integrated and customizable noise generator with amplification
  - Smart Phone Apps
  - Brainstem Implant (early stage)
  - Cochlear Implant (intact VIIIth nerve)

Q5

Questions:

- What is tinnitus habituation/retraining therapy?
- How is this done for a patient with SSD?
- What additional concerns arise with VIIIth nerve resection as opposed to intact VIIIth nerve?
- What can this tell us about tinnitus habituation, and how does this play into cognitive behavioral and mindfulness therapies for other disorders?

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Cochlear Implantation for Single-Sided Deafness with Tinnitus: A Case Study

Vicki Gonzalez, AuD, PhD

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Department of Otolaryngology - Head and Neck Surgery

University of Mississippi Medical Center

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CI SSD Case Study

- 44 year old male experienced a traumatic fall 8 ft off a ladder
- CT Scan revealed left sided severe longitudinal and transverse temporal bone fractures involving the posterior SCC. Ossicles appeared intact
- Audiological Symptoms
  - Fluctuating hearing loss in the left ear
  - Constant tinnitus fluctuating in loudness in the left ear
  - Brief episodes of dizziness

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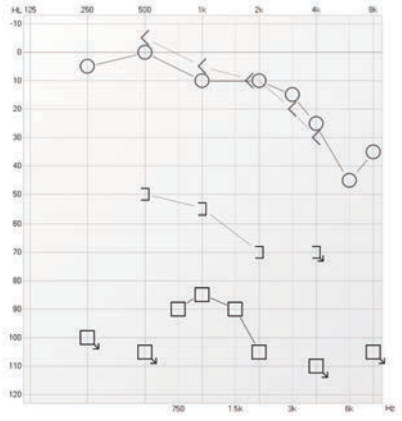
CI SSD Case Study

- Hearing Evaluation outpatient 15 days post-fall
  - Right Ear
    - Normal hearing sensitivity with mild high frequency (6k-8k Hz) sensorineural hearing loss
  - Left Ear
    - Severe to profound mixed hearing loss
    - Flat tympanogram with normal ear canal volume



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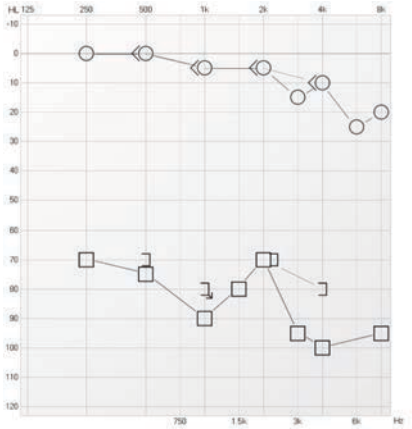
CI SSD Case Study

- 3 Months post-fall
  - Bothersome loud left sided tinnitus
  - Right Ear
    - Normal hearing sensitivity
  - Left Ear
    - Moderately-severe to profound sensorineural hearing loss



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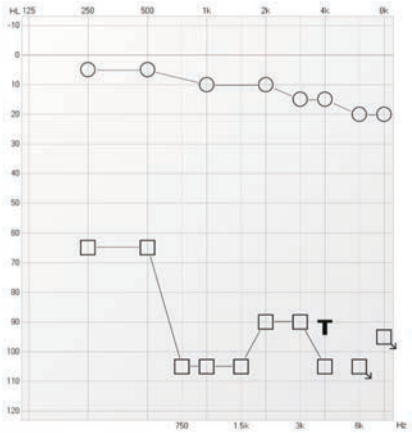
CI SSD Case Study

- Three years between internal ENT appointments
  - Underwent consultations at multiple outside otology practices
  - Treated with oral and intratympanic steroid injections
  - Fit with hearing aid with tinnitus masker in the left ear
  - Bone conduction implant was recommended several times

CI SSD Case Study

- Tinnitus Evaluation
  - 3 years, 3 months post-fall
  - Right Ear
    - Normal hearing sensitivity
  - Left Ear
    - Moderately-severe to profound sensorineural hearing loss with 0% WRS



CI SSD Case Study

- Tinnitus Evaluation
  - Tinnitus Functional Index (TFI)
    - Score of 51
    - Suggesting a significant impact on his quality of life
  - Pitch Match
    - 4000 Hz NBN in the left ear
  - Loudness Match
    - 82 dB HL in the left ear (17 dB SL)
  - Minimum masking level (MML) with white noise
    - 20 dB HL in the right ear
    - 20 dB HL binaural condition
    - 75 dB HL in the left ear

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CI SSD Case Study

- Recommendations
  - CROS system, bone conduction implant, cochlear implant or…
  - keep a hearing aid on his left ear and put a mild gain hearing aid on the right ear with a remote mic option
- Underwent hearing aid consultation two weeks later who referred for cochlear implant evaluation

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CI SSD Case Study

- Cochlear Implant Evaluation
  - 3 years, 5 months post-fall
  - Patient reported
    - Bothersome tinnitus in the left ear
    - Limited to no benefit from his left hearing aid
    - Expressed concerns with inability to localize sounds as he is often in a construction site (CPA for construction companies)
    - Primary caretaker for three active children requiring communication in challenging situations with background noise
    - Significant effects on quality of life
      - Occupationally avoiding group meetings
      - Socially avoiding restaurants, school functions, and sporting activities
      - Kids have begun to express frustrations

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CI SSD Case Study

- Speech Spatial Qualities (SSQ) of Hearing Scale
  - **Speech Hearing = 1.43** suggesting extreme difficulty with speech understanding in the presence of competing sounds, with multiple talkers, and in different background conditions
  - **Spatial Hearing = 1.07** suggesting an inability to make directional and distance judgments relative to an auditory signal
  - **Qualities of Hearing = 2.00** suggesting considerable issues with segregation of sounds, speech recognition, clarity/naturalness of the speech, and listening effort

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CI SSD Case Study

- AzBio sentences were administered in sound field in quiet and in noise with multitalker babble with the signal presented at 270° azimuth (left) and multi talker babble presented at 90° azimuth (right).
  - Right ear unoccluded throughout testing.

CONTINUED THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

CI SSD Case Study

- Unaided Evaluation
  - 100% words correct - Quiet
  - 19% words correct- +5 SNR
- Aided Evaluation
  - 43% words correct - +5 SNR with the Hearing Aid
  - 44% words correct - +5 SNR with the Cochlear Baha sound processor
- Cochlear Implantation was recommended

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CI SSD Case Study

- Underwent cochlear implantation of the left ear 3 years, 7 months post fall
  - MED-EL Synchrony Cochlear Implant System
- Two (2) weeks post-activation patient reported
  - Excellent benefit
  - Prefers having it on than off
  - Significant improvement in difficult listening environments
  - Notable decrease in loudness of his tinnitus

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CI SSD Case Study

- One (1) month post-activation
  - 63% words correct - +5 SNR
- Three (3) Months post-activation
  - 87% words correct - +5 SNR
  - Tinnitus is very minimally to not at all noticeable with use of sound processor
- Five (5) Months post-activation
  - Speech Spatial Qualities (SSQ) of Hearing Scale
    - **Speech Hearing = 8.15**: significant improvement with speech understanding in the presence of competing sounds, with multiple talkers, and in different background conditions
    - **Spatial Hearing = 8.87**: significant improvement in his ability to make directional and distance judgments relative to an auditory signal.
    - **Qualities of Hearing = 8.61**: significant improvement with segregation of sounds, speech recognition, clarity/naturalness of the speech, and listening effort.

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- Soleymani et al (2011) systematic review of surgical approaches to tinnitus treatment
  - > 90% of patients experienced some degree of tinnitus suppression as a result of cochlear implantation
  - 37% to 61% experienced complete tinnitus suppression
  - Patients with more severe tinnitus handicaps reported greater suppressive relief of tinnitus as a result of cochlear implantation

Q4

- Levy et al. (2020) systematic review of cochlear implantation for tinnitus treatment with SSD
  - 89.4% experienced some degree of tinnitus suppression as a result of cochlear implantation
  - 14.9% experienced complete tinnitus suppression
  - 7.6% perceived no change in severity of tinnitus
  - 3% experienced worsening tinnitus

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Pulsatile tinnitus

Thomas L. Eby, M.D.

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Presentation

- A 41 year old African American woman reports gradual right hearing loss accompanied by a “swooshing” sound.
- When she developed intermittent pain she saw a physician who prescribed antibiotics for a red appearing tympanic membrane
- The hearing loss and redness did not improve so she was sent to ENT
- She reports the “swooshing” keeps time with her heart beat

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Examination

- The right ear canal was normal and the tympanic membrane intact
- A bright red mass seen filling the middle ear on the right
- A slight red hue is seen beneath the left tympanic membrane
- An audiogram was obtained

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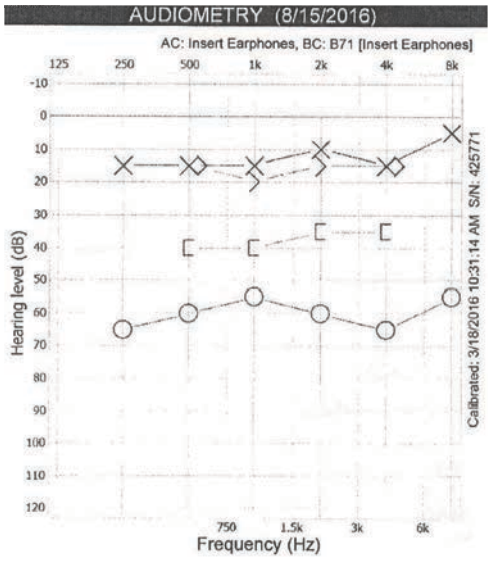
Audiogram



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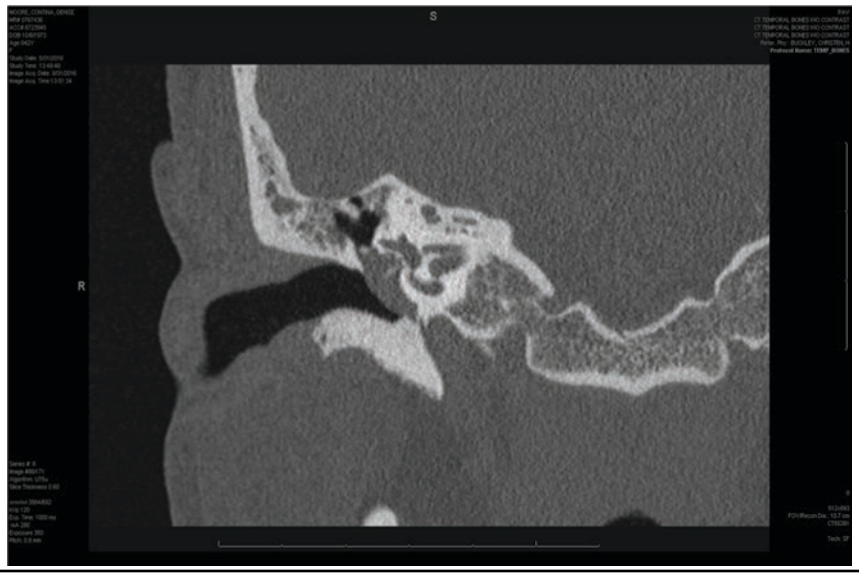
CT Scan



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Surgery

- Diagnosis: middle ear tumor, probably benign
- Surgery performed through the ear canal
- Tympanic membrane elevated
- Small highly vascular tumor removed from middle ear and ossicles preserved
- CO2 laser used to control bleeding

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Pathology

- Vascular neoplasm with thin vessels and dilated lumens
- Zellballen pattern: nests of cells
- Cytoplasmic margin ill-defined
- Round nuclei with finely granular chromatin
- Diagnosis: paraganglioma aka
  glomus tympanicum

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Post Operative results

- Gradual improvement in hearing
- “Swooshing” tinnitus gone
- Audiogram shows conductive hearing loss resolved but sensorineural loss same
- Patient did not want hearing aid
- Post operative CT obtained

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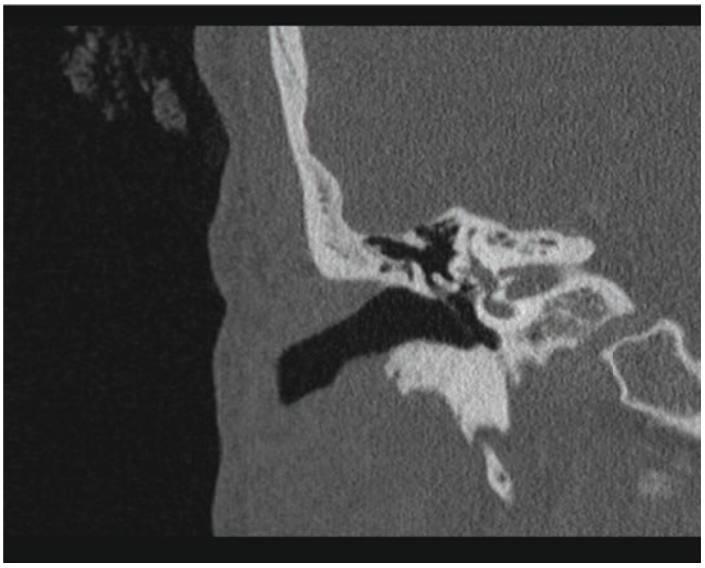
CT scan post op



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Pulsatile tinnitus

- Only 10% of tinnitus patients report pulsatile tinnitus
- Of these patients only 29% had findings on imaging
- Paragangliomas found in 12% of patients with pulsatile tinnitus
  - Usually diagnosed by characteristic examination

Q3

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Causes of Pulsatile Tinnitus: Vascular

- A-V malformation
- Carotid or stapedial artery anomaly
- Jugular vein and sigmoid sinus anomalies
- Possibly turbulent flow through normal jugular bulb

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Causes of pulsatile tinnitus: Osseous

- Paget's disease
- Osseous hemangioma in temporal bone
- Advanced otosclerosis

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Causes of Pulsatile Tinnitus: Increased Intracranial Pressure

- Suspected if bilateral
- Associated with elevated BMI
- May have other findings:
  - Retinal papilledema
  - Empty sella on head CT
- Tinnitus may improve if pressure lowered

Q2

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Paraganglioma

- Arises from chemoreceptor cells
- Found along vagus nerve in neck and ear
- 7-10% are genetic in origin
  - Associated with bilateral or multiple tumors
  - Autosomal dominant
  - Succinate dehydrogenase protein mutation

References

- Kirchner ML, Standring RT, Leonetti JP: Neuroradiologic assessment of pulsatile tinnitus. J Otolaryngo Head Neck Surg 2008;139(suppl):144 doi 10.1016
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Case of CM

Alex Elkins, AuD

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Learning Outcomes

After this course, participants will be able to:

- Describe 3rd window disorders
- Explain why 3rd window disorders can cause air-bone gaps on a hearing evaluation
- Explain most common symptoms related to 3rd window disorders

CONTINUED THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

Case CM

- 55 year old male
- Avid sky diver and occasional scuba diver
- History of eustachian tube dysfunction, ear pain, bothersome tinnitus, dizziness
- Multiple sets of PE tubes
- Documented HF SNHL

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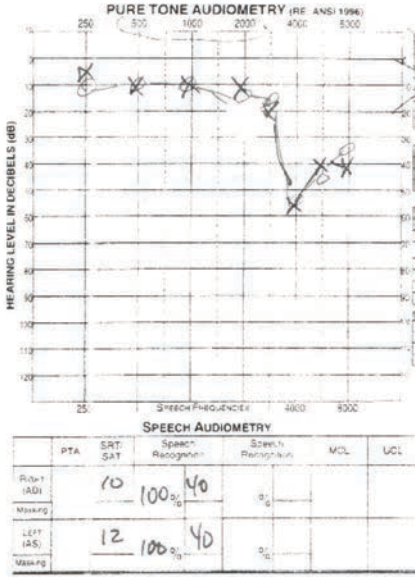
Case CM

- Outside hearing evaluation



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Case CM

- Highly distressed
- Constant pain and pressure
- Loud bothersome tinnitus
  - Interfered with sleep
  - Caused stress and anxiety
  - Worse when dizzy
- Dizziness
  - Imbalance
  - Occasional spinning sensation
  - Worse with head movement
  - Denied sudden episode of prolonged vertigo

CONTINUED

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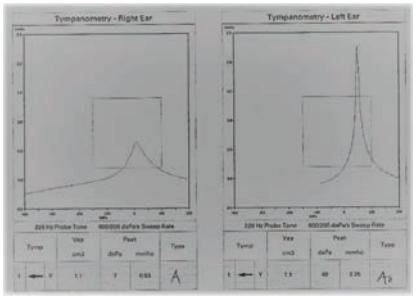
First Visit

Saw in house ENT

- Mild retractions
- Able to self insufflate
- Did not repeat hearing evaluation
- Worked in for same day vestibular evaluation



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Vestibular Evaluation

- Left unilateral vestibulopathy
  - Unilateral caloric weakness in the left ear
  - Abnormal vHIT localizing to the left lateral and posterior semicircular canals
  - Tests of gaze stabilization, oculomotility, and static and dynamic positioning were normal
- VEMPs were not performed
- Fistula test was negative
- No history of sudden onset of prolonged vertigo

CONTINUED THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

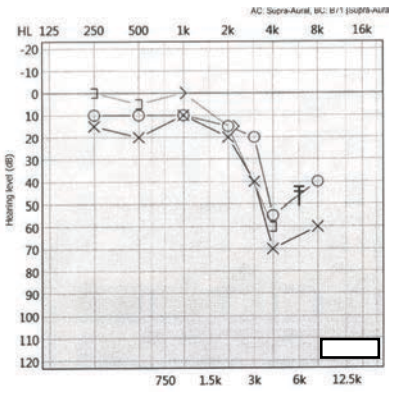
Next Steps

- CT of temporal bones and follow up with otologist
- Tinnitus evaluation
- Hearing aid consultation and fitting
- Began PT for balance disorder
- Psych referral
- Considering eustachian tube dilation

CONTINUED THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

Tinnitus Evaluation

- Bilateral tinnitus described as a “tea kettle” sound
- Occasional pulsatile tinnitus
- TFI score 71/100
- Pitch matched to 6000 Hz
- Loudness match to 48 and 46 dB HL (5 dB SL) in the right and left ears, respectively
- MML was 15 dB HL with white noise (15 dB SL)
- Binaural MML was 20 dB HL



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Hearing Aid Fitting

- Starkey Halo 2 i1600 fit to NAL-NL2
- Low level tinnitus masker program added to device
  - Reported he could still hear his tinnitus
  - Masker was reported as comfortable
- Patient reported satisfaction with sound quality
- Overall, he was satisfied with settings at fitting
- Long discussion regarding anxiety and depression with relations to tinnitus and dizziness symptoms

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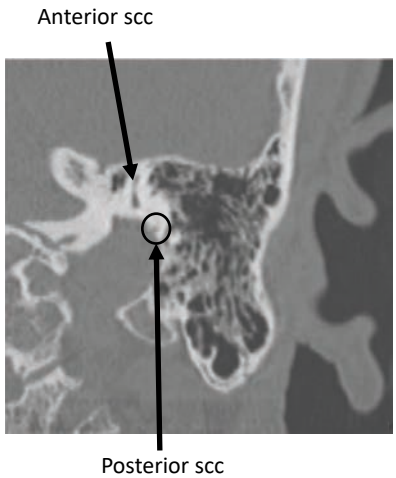
CT

- Posterior scc dehiscence with high riding jugular bulb
- Vast majority of semicircular canal dehiscence are in the superior scc
- Now in discussions with otologist regarding surgical intervention



Q7

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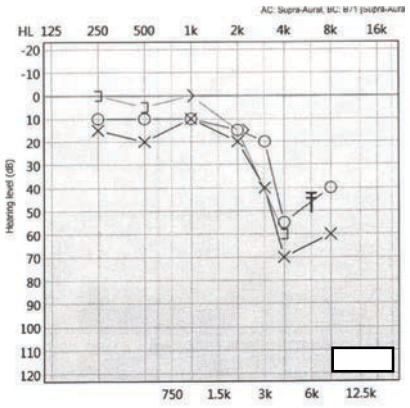
Dehiscence

- 3rd window disorder
- Layer of bone exposes the labyrinth
- Symptoms:
  - Dizziness to pressure and/or loud sounds
  - Increased sensitivity internal sounds
  - Hearing loss, typically low frequency air-bone gaps
  - Pulsatile tinnitus



Q6

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Dehiscence and Air-Bone Gaps

- Why AB gaps?
- Reduced sensitivity to air-conduction stimuli
- Hyper sensitive to bone-conduction stimuli

Blausen.com staff (2014). "Medical gallery of Blausen Medical 2014". *WikiJournal of Medicine* 1 (2). DOI:10.15347/wim/2014.010. ISSN 2002-4436.

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Hearing Aid Follow Up 1

- Not satisfied with the hearing aids
- Some improvement in hearing but hearing aids were too loud
  - Hearing difficulty was not really a complaint
  - Made slight reduction in gain changes aided by speech-mapped real ear probe mic measures
- Not effective in reducing tinnitus
  - Reported masker was too low pitch
  - Raised frequency of masker – patient noted less satisfying sound quality

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Hearing Aid Follow Up 2

- Still unsatisfied with the hearing aids
- Masking noise was more bothersome than the tinnitus
- Hearing aids not beneficial for tinnitus
- Has no real hearing difficulty concerns
- Returned the hearing aids, but…
- He did note his tinnitus has been less bothersome since his initial appointment
- Why was his tinnitus improved?
- Sound stimulation alleviating the effects of tinnitus
- Reduced anxiety as a result of treatment

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Anxiety, Dizziness, and Tinnitus

- Anxiety and depression can also impact dizziness (Dieterich and Staab, 2017)
  - Persistent postural perceptual dizziness (PPPD)
- Anxiety and depression and tinnitus disturbance are closely related (Cho et al., 2013)
- Regular visits with psych and placed on SSRI
- PT for vestibulopathy
- Tinnitus counseling
- Treatment plan for present condition

- All likely have led to decrease in anxiety level and decrease in tinnitus disturbance

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Case CM

- Summary

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References

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- Dieterich, M., & Staab, J. P. (2017). Functional dizziness: from phobic postural vertigo and chronic subjective dizziness to persistent postural-perceptual dizziness. *Current opinion in neurology*, *30*(1), 107-113.
- Ho, M. L., Moonis, G., Halpin, C. F., & Curtin, H. D. (2017). Spectrum of third window abnormalities: semicircular canal dehiscence and beyond. *American Journal of Neuroradiology*, *38*(1), 2-9.

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Illustrative Case: Nuts and Bolts

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Department of Otolaryngology-Head and Neck Surgery

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Illustrative Case:

Outline

- History & Chief Complaint
- Functional Impact
- Evaluation
- Management

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History

- 60 something year old male
- Referred by outside ENT
- Referral documents included history and audiogram/tympanometry
  - Constant high pitch ringing both ears
  - HENT: negative for hearing loss, otalgia, vertigo, aural fullness or q-tip use, nose bleed, sinus pain or sore throat
  - All other systems negative for issues
  - Meds: Aspirin 81 mg, Lipitor, klonopin
  - Head & Neck Exam: Normal
  - MRI negative for retrocochlear pathology

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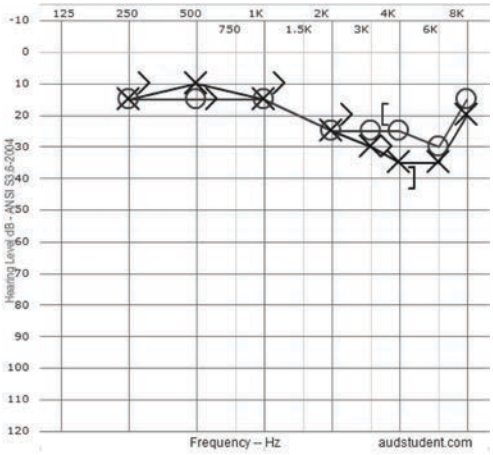
Audiometry & Tympanometry



SRT
L: 20
R: 20
WRS
L: 96%
R: 96%

Tympanometry
L: Type A
R: Type A

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My History & Chief Complaint

- Long-standing tinnitus > 20 years
- Tinnitus exacerbated (louder) by attendance to a concert ~6 weeks prior resulting in significant anxiety and sleep disturbance resulting in a prescription for klonopin (patient does not want to use)
  - Initially saw primary care and then local ENT
- Denied hearing loss or sudden change in hearing beyond some fullness that resolved after concert
- He did report some difficulty understanding grandchildren and conversations in noisy environments which he attributed to the tinnitus

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My History & Chief Complaint

- Significant noise exposure history: occupational and recreational (firearm use and music)
- Denied any balance issues
- Patient taking lipoflavanoid as recommend by his physician, but has not noticed a difference
- Recently retired, exercises daily, moderately healthy diet, oldest son in rehab
- Tinnitus
  - Localized to both ears, louder in left ear
  - High pitch electrical high wire sound
  - Denied pulsatile or clicking tinnitus (secondary)

Q9

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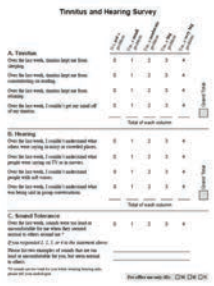
Functional Impact


Tinnitus and Hearing Survey

- Tinnitus Hearing Survey
- Tinnitus Functional Index (TFI)
  - Overall Score 88
  - Highest scores on concentration, sleep, and auditory
- Expressed concern about sudden change, need for medication, and about playing music or attending concerts

Q10

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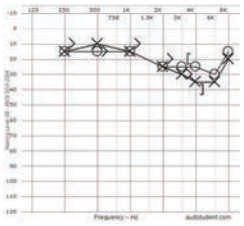
Evaluation



- Recent audio on file
  - Too repeat or not repeat?
- Tympanometry was normal, any other testing?

Tinnitus Evaluation	Left	Right
Pitch Match	4000 Hz	4000 Hz
Loudness Match	47 dBHL (12 dBSL)	30 dBHL (7 dBSL)
Minimum Masking	30 dBHL	30 dBHL

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Management

- Significant reaction to change in tinnitus induced by a noise exposure
- Affecting sleep, concentration, hearing, and overall quality of life
- Does not want to be on medications

- 5 Step Counseling
  - Source
  - Habituation/Cognitive
  - Sound therapy
  - Attention
  - Diet, exercise, sleep

BE FLEXIBLE

For more information view Principles of Tinnitus Evaluation and Management II
https://www.audiologyonline.com/audiology-ceus/course/principles-tinnitus-evaluation-management-ii-31554

Q8

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Management

- Source
  - Reviewed hearing test results, neuroscience of tinnitus (peripheral and central), change, and new reaction; normalcy of tinnitus and reaction
- Habituation/Cognitive
  - Defined habituation and gave examples
  - Discussed maladaptive thoughts/behaviors and alternative strategies; musician ear plugs
  - If feeling overwhelmed consider behavioral therapy, provided contact information
- Sound Therapy
  - Reviewed sound therapy options
  - Recommended hearing aids with sound generator
- Attention
  - Highlighted role of attention in modulating tinnitus perception
  - Suggested basic exercise to demonstrate control
- Diet, exercise, sleep
  - Recommended eating healthy, being active; discuss lipoflavonoids
  - Provided sleep hygiene tips, including use of sound pillow/dream pad

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Follow-up & Summary

- Patient seen 6 weeks later for follow-up and hearing aid demo
- Patient completed TFI = 26
- Patient reports significant reduction in tinnitus reaction
  - He purchased a sound pillow which has significantly improved his sleep; no longer taking klonopin
  - Discontinued lipoflavanoid
  - Purchased non-custom musician ear plugs ER20s (no spikes)
  - Declined hearing aid demo, reported real issue was the abrupt change in tinnitus and stress, felt much better after our appointment, now that he knows the tinnitus is not causing the hearing loss feels he can hear fine
- Patient was scheduled for another follow-up 6 months later; cancelled

CONTINUED

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Question & Answer

- Thank you for your attention, we are happy to address any questions