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Medical/Surgical Management of Conductive Hearing Loss

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Outline

- Characteristic audiometric findings
- Unusual causes of air-bone gap
- Surgical treatment
- Medical treatment
Conductive Hearing Loss: Causes

**External Canal**
- Cerumen
- Foreign body
- Exostosis
- Osteoma
- External otitis
- 
- 

**Tympanic**
- Perforation
- Tympanosclerosis
- Medialized drum
- Lateralized drum

**Middle Ear**
- Otitis media
- Ossicular discontinuity
- Otosclerosis
- Tympanosclerosis
- Malleus fixation

**Third Window**
- Semicircular canal dehiscence
- Enlarged vestibular aqueduct
- X-linked deafness
- Paget disease
Carhart Notch (Carhart Effect)

- Carhart: 1950
  - Otosclerosis
  - Maximal 2 kHz (0.5 - 4 kHz)
- Found in:
  - Otosclerosis
  - Incudostapedial joint dislocation
  - Malleus/Incus fixation
Carhart Notch (31%)  (Perez A. O & N. 30:1033-; 2009)

Carhart Notch (32%)  (Perez A. O & N. 30:1033-; 2009)
Carhart Notch (37%)  (Perez A. O & N. 30:1033-; 2009)

Carhart Notch  (Perez A. O & N. 30:1033-; 2009)

CONTINUED™
Incidence of 2kHz Bone Dip

Incidence, %

- Stapes Fixation: 31
- I/S Joint Separation: 26
- Malleus Fixation: 30

Kashio, A. Arch Oto H N Surg.137(3):236-240; 2011

Depth of 2kHz Bone Dip

dB

- Stapes Fixation: 17.3
- I/S Joint Separation: 18.5
- Malleus Fixation: 16.3

Kashio, A. Arch Oto H N Surg.137(3):236-240; 2011
Malleus Fixation

(Martin, C. O & N. 30:165-169; 2009)

Ossicles
Malleus Fixation

Case 1: C. D.
- 6 y.o F
- “Failed” school hearing evaluation
- Whitish mass behind ear drum
Kurz Footplate Shoe

Case 2: P. B.

- 56 y.o. M
- Referred for treatment of otosclerosis
Case 2: P. B.

- Dizziness when using telephone in left ear for 16 years
Normal Air Conduction

Merchant S. O & N. 29:282-289;2008

Third Window Lesions Air Conduction

Merchant S. O & N. 29:282-289;2008
Case 2 (C.B. Postop)

Enlarged Vestibular Aqueduct

Medical Management
Air-Bone Gap, Now What?

- Cross check testing
  - Case History, Otoscopy, Impedance Testing
- Additional testing
- Equipment considerations
  - Are there clogs or breaks in insert earphone tubing?
  - Are the inserts or headphones placed correctly?
- Refer to ENT

Audiologists’ Role

- After following up with physician…
- Patient’s conductive hearing loss may be resolved
- Patient may continue to present with conductive or mixed hearing loss
  - How can audiologists help?
Assistive Device Options

• Hearing Aids
  • ITE, BTE, RIC, Bone Conduction

Photos courtesy of Starkey

Assistive Device Options

• Implanted Bone Anchored Hearing Solution
• Cochlear Americas
• Oticon Medical

Photos courtesy of Cochlear Americas and Oticon Medical
Hearing Aid Style Considerations

• Degree of hearing loss
  • May need larger hearing aid to accommodate larger receiver
  • However, today’s powerful receivers are smaller than years ago

• Chronic drainage from ear
  • Conventional BTE with standard earmold will be more durable

• Size and shape of ear canal
  • Surgically altered or not

Earmold Impressions

• Use multiple otoblocks if needed to ensure that ear canal is completely sealed
Earmold Impressions

• Make sure impression can be passed through the narrowest part of the canal when being removed

Programming Considerations

• Entering bone conduction values into programming software will change targets
• Will accommodate for air-bone gap
THANK YOU!

Questions:
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