SURGERY AND REHABILITATION OF THE EAR

Management of Aural Atresia
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Introduction: congenital defect; hypoplasia of external auditory canal, often associated with dysmorphic features; defect in auricle, middle ear, and occasionally, inner ear structures; incidence 1 in 10,000 to 20,000 births; typically unilateral; more frequent in right ear and in males; >10% associated with syndromes, e.g. Treacher Collins, Goldenhar, hemifacial microsomia; >5% not syndromic, but inherited; inner ear abnormalities =22%, defects of semicircular canal most common; congenital facial palsy =13%

Treatment options: atresioplasty—challenging surgery; >50% of patients candidates for surgery; with associated craniofacial anomaly =25%; candidacy for atresioplasty; hearing aids—bone-conduction hearing aids good option, irrespective of intention to do surgery; in United States, bone-anchored hearing aids (BAHA) implanted after age 5 yr, when bone thickness >4 mm; in Europe, implants at 9 mo to 1 yr, despite evidence of higher failure rates, atresioplasty done after malperial repair, except when Medpor used

Goals of atresioplasty: serviceable hearing ≥30 dB; speech reception threshold (SRT) 15 to 20 dB; serviceable binaural hearing in patients with unilateral defect; postoperative thresholds <35 dB less beneficial due to loss of binaural hearing; ultimate goal, safe dry ear

Assessment: air and bone conduction thresholds; sensorineural hearing loss in patients with bilateral congenital aural atresia; provides better sense of thresholds of bone lines; microtia grading—1) Altman classification; 2) Altman classification by Cremers more popular in Europe; 3) Jahrsdoerfer classification more popular in United States; based on computed tomography (CT) results and perinatal outcomes; gold standard for evaluation; 2 points for stapes, 1 for everything else; no atresia when score ≥9; majority of patients eligible for surgery in 7 to 8 range; only system with available outcomes data; 4) new system by Yellon and Branstetter; 13-point scale; more detailed assessment of middle fossa defect, position of incudomallear complex, and position of facial nerve relative to middle ear, oval window, and round window; critical for doing middle ear implants; 2 points for stapes; 1 point for everything else; poor pneumatization of middle ear and mastoid predict poor outcomes; >90% chance of SRT <30 dB in patients graded ≥7

Educational Objectives
The goal of this program is to improve the management of patients with aural atresia, chronic ear disease, and hearing loss. After hearing and assimilating this program, the clinician will be better able to:

1. Assess patients with aural atresia and perform atresioplasty when indicated
2. Use bone-anchored hearing aids, as well as newer middle ear implant system technology (e.g. Vibrant Soundbridge), to manage patients with aural atresia
3. Discuss the pros and cons of second look surgery after surgery for cholesteatoma and review the evidence
4. Evaluate patients with recurrent hearing loss, and suggest helpful strategies and amplification to manage loss
5. Assess and manage patients with tinnitus or noise-induced hearing loss

Faculty Disclosure
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5. <50% chance in grades 6; recent upward shift in eligibility for surgery, hence >50% eligible
6. Recent upward shift in eligibility for surgery, hence <50% eligible
7. A recent upward shift in eligibility for surgery, hence <50% eligible
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9. A recent upward shift in eligibility for surgery, hence <50% eligible
10. A recent upward shift in eligibility for surgery, hence <50% eligible

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soft cortical bone, thin wall, and failure of device; outcomes better in United States, in part because of wearing and adherence
of device.

Otoscopy, tympanometry, and audiometry are performed in patients with a previous history of frontal sinusitis, to assess for cholesteatoma.

Nonsurgical treatment includes tympanostomy tube insertion, corticosteroids, and antibiotics. Surgical treatment includes transcanal tympanomeatal flap, intratympanic steroid injection, and myringotomy.

Cholesteatoma: Secondary-Look Procedures

Robert D. Hayes, MD, Professor, Department of Otolaryngology, Department of Hearing and Speech Sciences, Vanderbilt University Medical Center, Nashville, TN

Preoperative considerations for chronic ear disease: discuss risk-benefit ratio; explain to patient less risk associated with surgery than with not doing surgery; explain second look; discuss need for possible canal wall down surgery; user uses video of himself explaining phases of chronic ear disease, etiol- ogy, preoperative and intraoperative findings, and post- operative course; documents informed consent process; saves time, and improves understanding of patients; new symptoms reported by the patient on day of surgery; patient decision making; surgeon recommends surgical treatment in every case, just before incision, after patient prepped and draped; imaging showing the right side of a patient's head on the left; CT scan showing the right side of a patient's head on the left; angina, facial nerve symp- toms, and anatomy

Adjunctive techniques: CO2 laser scalpel (OmniGuide)—no need for filter in scope or for macroplasmat; speaker does not use when using for granulation tissue and erosion of stapes

Superstructure; intraoperative CT scanner—on wheels; used for pediatric congenital anomalies; ages dis- ease, facial nerve anomalies, cochlear anomalies, and cochlear implant surgeries; speaker prefers wide prep with povidone iodine (Betadine); chlorhexidine contraindicated because of ototoxicity; speaker uses propranolol, intravenous antibiotics, and post- operative antibiotics; prefers ciprofloxacin over bacitracin, cip- roflexin not ototoxic; and effective against Pseudomonas and Staphylococcus species; dose 500 mg intravenous (IV); speaker puts patients into sterile field to irrigate; sterile surgical technique; speaker uses facial nerve monitoring in all cases, hemostasis key to preventing complications; 3 strengths of adrenaline in premixed 1:100,000 lidocaine, 1:50,000, and 1:150,000, and undiluted in gel form (for topical use)

Second Look: secondary markers make otologic surgery difficult; some surgeons never second look, while others always do; speaker decides intraoperatively; some sur- geons more aggressive in pediatric congenital popula- tion; speaker treats pediatric and adult patients similarly; advantages—discovery of residual disease; avoidance of cata- strophic outcomes; better hearing results; second operation may be unnecessary; cost of procedure to patient, eg, copayment, incidental treatment of unrelated school or work (21 wk); economic impact; diffusion-weighted magnetic reso- nance imaging (MRI) can demonstrate residual cholesteatoma and can be used for clinical follow-up in patients who do not have persistent disease.

Common misconceptions:

Audiologic assessment and surgical management of chronic ear disease.

Suggested Reading


Naidich TP: Second-look procedures for pediatric cholesteatoma.

Challenges:

Suggested Reading


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Hearing and Loss Rehabsilitation: An Audiologist’s Perspective

Angela Gerbasi, AuD, Audiology, Georgia Health Sciences Medical Center, and Audiologist, MCG Audiology Associates, Augusta, GA.

Suggested Reading

Jahrsdoerfer S: Bone thresholds better than 45 dB; word recognition limited on average 33% in patients at risk. Jahrsdoerfer score 6.
Jahrsdoerfer SJ: Hearing loss attributed to noise; test individuals at risk for noise exposure; educate parents.

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1. Which of the following statements about atresiaplasty is false?
   (A) About 50% of patients with aural atresia are suitable candidates for atresiaplasty.
   (B) In presence of craniofacial anomaly, >75% of patients with aural atresia are suitable candidates for atresiaplasty.
   (C) Atresiaplasty follows microtia repair, except in cases where Meixel used.
   (D) The goals of atresiaplasty include serviceable hearing >30 decibels.

2. In the United States, the _______ system is the gold standard for evaluation of aural atresia.
   (A) Altman
   (B) Cremer
   (C) Jahrsdoerfer
   (D) Yellow and Branstetter

3. Consent recommendations for bone-anchored hearing aids include which of the following?
   (A) Jahrsdoerfer score ≤ 5
   (B) Bone thresholds better than 45 dB
   (C) Word recognition score >60%
   (D) Age > 5 yr in United States

4. The Vibrant Soundbridge middle ear implant system is recommended for patients with aural atresia and Jahrsdoerfer score ≤ 5.
   (A) True
   (B) False

5. Which of the following statements about second-look surgery for cholesteatoma are true?
   (A) Associated with increased cost
   (B) Can reveal residual disease
   (C) Has emotional impact on patient and family
   (D) A, B, and C

6. In second-look surgery in children, there is no association between recurrent disease and:
   (A) Timing of second look
   (B) Degree of conductive hearing loss
   (C) Presence of perforation
   (D) Presence of otitis media

7. Recurrent cholesteatoma is associated with:
   (A) Facial recess
   (B) Sinus tympani disease
   (C) Incus destruction
   (D) All the above

8. Assessment of hearing loss includes looking for nontypical signs such as:
   (A) History of chemotherapy, radiotherapy, or antibiotic use
   (B) Speech or language delay in children
   (C) Social isolation and emotional problems
   (D) All the above

9. Talking loudly provides more speech cues, making it easier for patients to understand.
   (A) True
   (B) False

10. Referral to _______ is probably the first step in managing patients with tinnitus.
    (A) Psychiatry
    (B) Audiology

Answers to Audio-Digest Otolaryngology Volume 45, Issue 11: 1-A, 2-A, 3-D, 4-A, 5-B, 6-A, 7-B, 8-A, 9-C, 10-C

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