

Cochlear Implantation for unilateral SNHL in the pediatric population

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Our Team

- ▶ Otolaryngology
- ▶ Audiology
- ▶ Speech and language pathology
- ▶ Social work

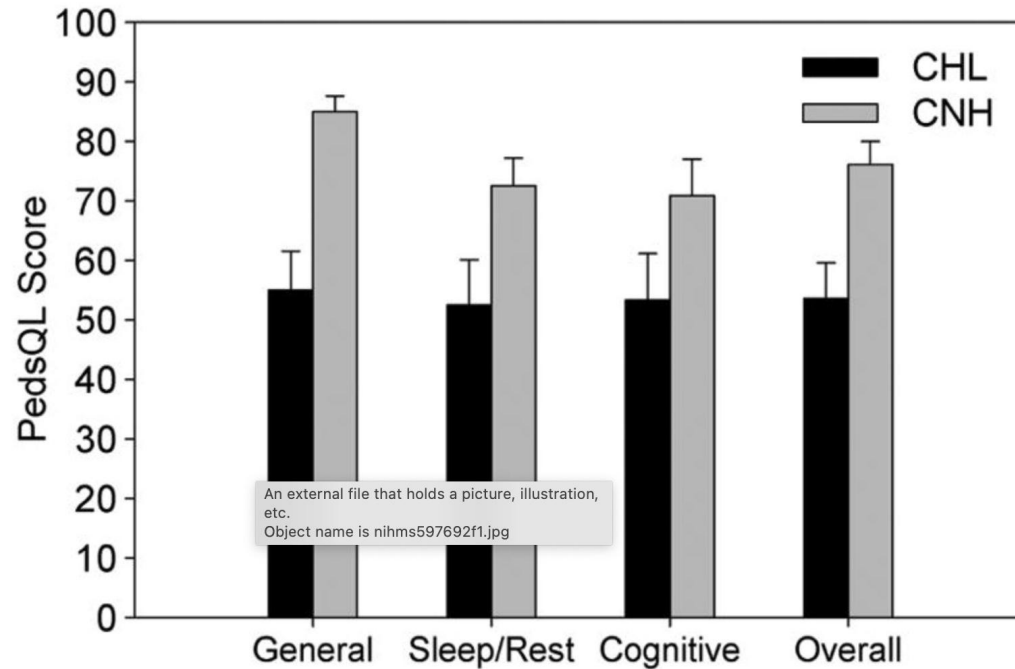


Impact of Unilateral Hearing Loss

- ▶ Despite normal hearing in one ear, children with unilateral hearing loss face educational, social, cognitive and behavioral challenges
 - ▶ Slower language acquisition
 - ▶ Understanding speech in noise
 - ▶ Sound localization
 - ▶ Poorer quality of life scores compared to peers with normal hearing

Fatigue in Children with hearing loss

Figure 1

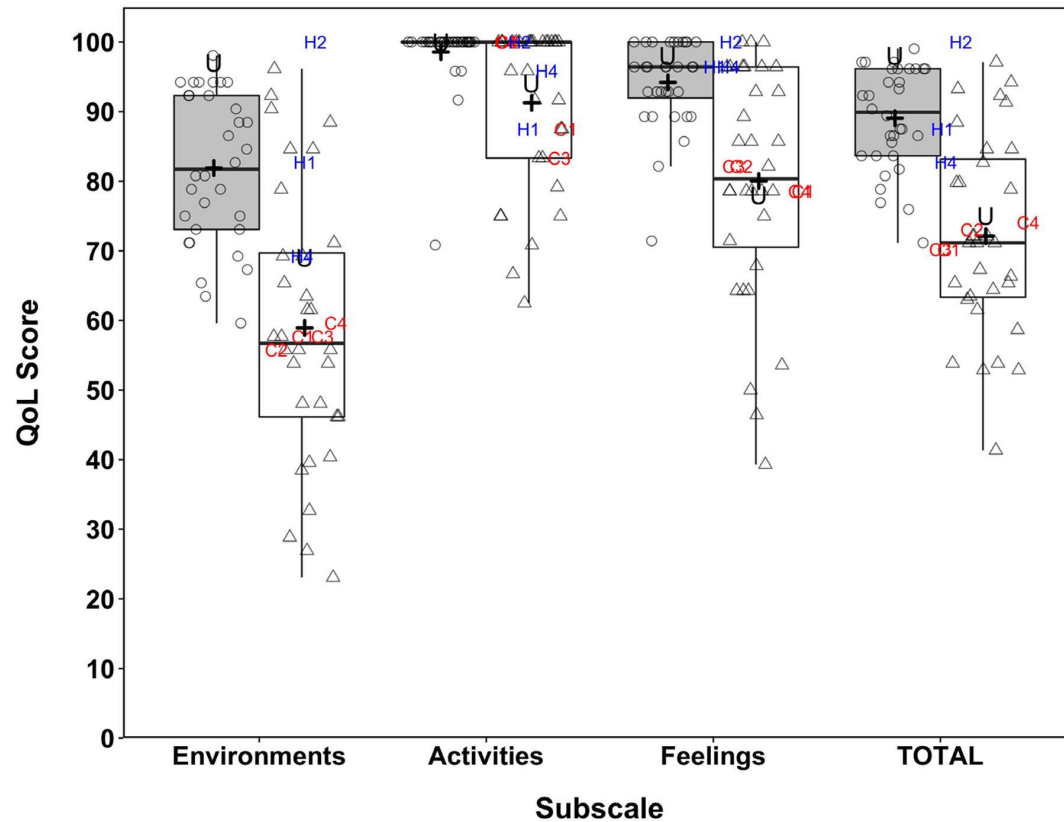


- ▶ Comparison of school aged normal hearing children vs. children with hearing loss

Mean Pediatric Quality of Life Inventory Multidimensional Fatigue Scale (PedsQL MFS) subscale and overall fatigue scores from children with hearing loss (CHL) and children with normal hearing (CNH). Lower values reflect more fatigue. Error bars = 1 standard error.

Hornsby, B. W. Y., Werfela, K., Camarataa, S. & Bess, F. H. (2014). Subjective Fatigue in Children with Hearing Loss: Some Preliminary Findings. *Am J Audiol.* 23(1): 129- 134.

QoL in children with UHL



Griffin, A.M., Poissant, S.F., & Freyman, R.L. (2018) Speech-in-noise and quality-of-life measures in school-aged children with normal hearing and with unilateral hearing loss. [ePub ahead of print Nov 8, 2018], *Ear Hear*, doi: 10.1097/AUD.0000000000000667.

Treatment options

- ▶ Early Intervention only
- ▶ Amplification
- ▶ Bone conduction hearing aid
- ▶ CROS style hearing aid
- ▶ Cochlear Implant

Cochlear Implants for UHL

- ▶ First FDA approved in 2019 (Med El)
- ▶ Still not widely accepted/practiced as an option in the USA
- ▶ Still not FDA approved for children under 5
 - ▶ But, we have had success getting insurance approval for our patients
 - ▶ Gaining traction
 - ▶ More data internationally (Canada, etc)

Ideal candidates

- ▶ Babies, implanted at a young age
- ▶ Progressive hearing loss
- ▶ Short duration of severe-profound hearing loss

Pre-op considerations

- ▶ Duration of hearing loss
- ▶ Etiology of hearing loss
- ▶ Anatomy
- ▶ Speech/language evaluation
- ▶ Social factors/support
- ▶ Expectations

Duration of hearing loss

- ▶ The shorter the duration of hearing loss, the better the outcomes
- ▶ 2021 meta-analysis
 - ▶ negative correlation between length of auditory deprivation and postoperative sentence and monosyllabic speech perception
 - ▶ longer DoD seems to lead to worse CI performance, whereas more experience with CI mitigates the effect.
- ▶ Newborns -
 - ▶ Well established data to support that the younger the age of activation, the better the outcomes

Culbertson SR, Dillon MT, Richter ME, Brown KD, Anderson MR, Hancock SL, Park LR. Younger Age at Cochlear Implant Activation Results in Improved Auditory Skill Development for Children With Congenital Deafness. J Speech Lang Hear Res. 2022 Sep 12;65(9):3539-3547. doi: 10.1044/2022_JSLHR-22-00039. Epub 2022 Aug 24. PMID: 36001854.

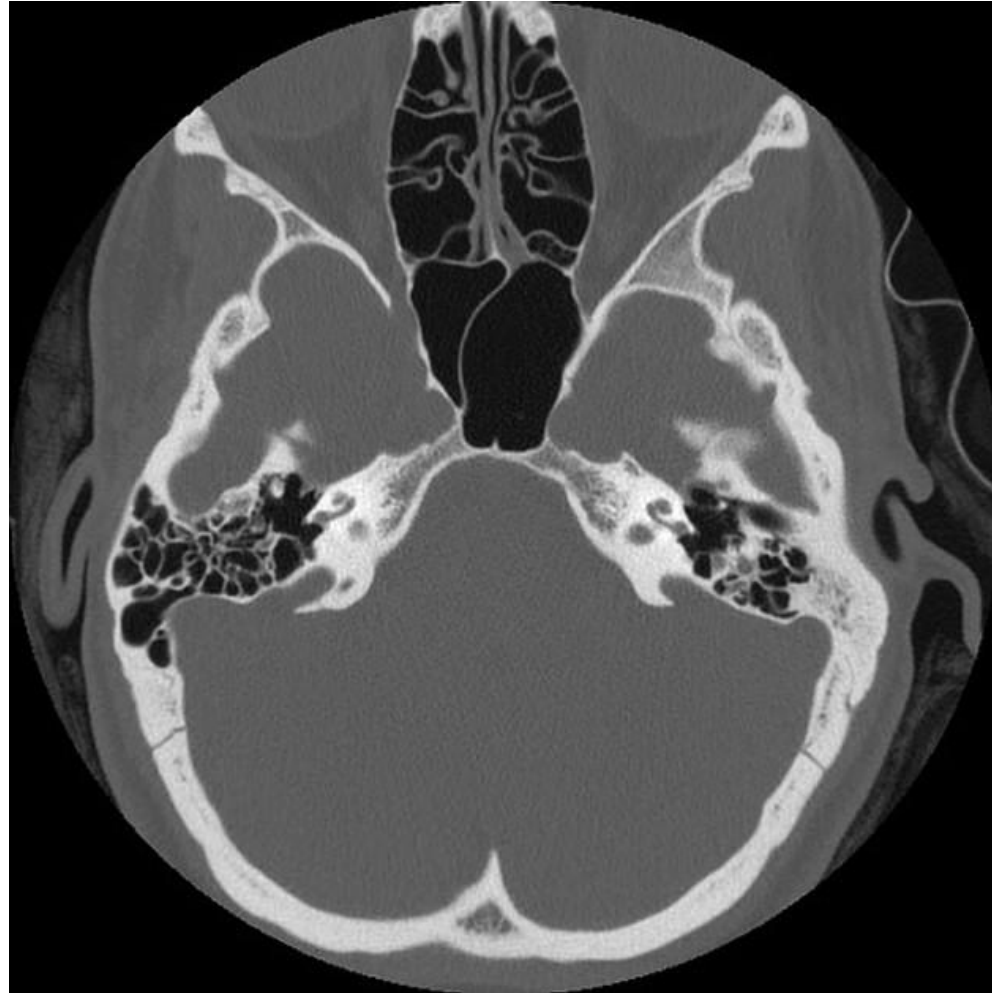
Etiology of hearing loss

- ▶ Imaging/genetic testing
- ▶ Don't always have this information
- ▶ Prognosis is important!
 - ▶ Is the "normal" ear at risk?
 - ▶ EVA, CMV, etc
 - ▶ This changes how we counsel parents

Anatomy

- ▶ CT scan/MRI is necessary for all patients
 - ▶ Surgeon preference
 - ▶ CT scan - bony anatomy
 - ▶ MRI - soft tissue

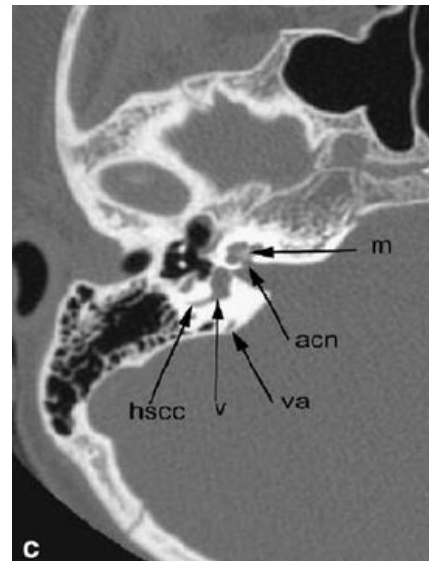
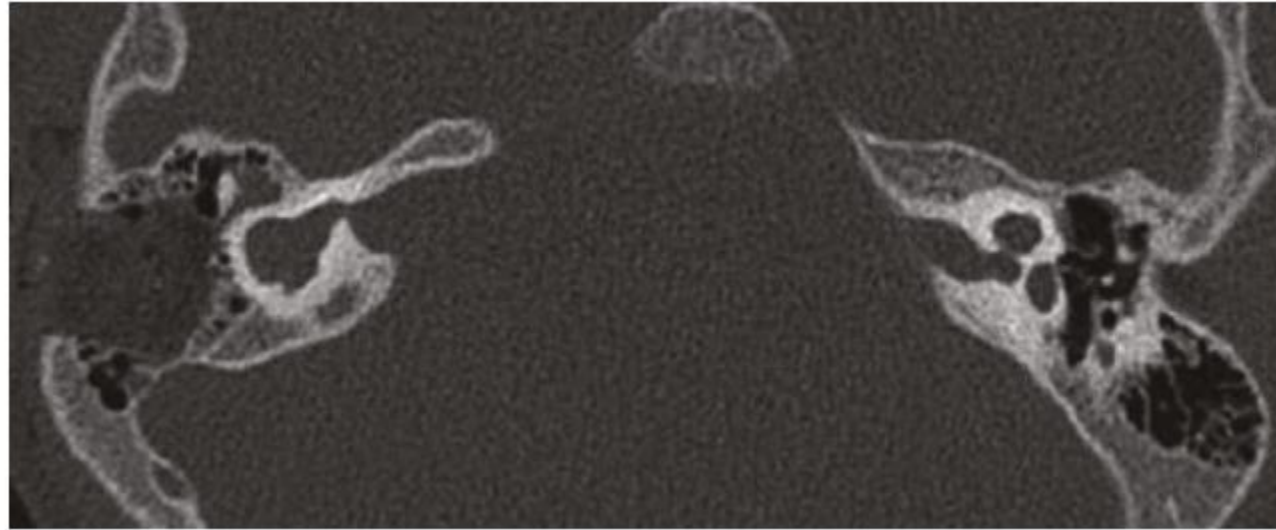
Bilateral EVA



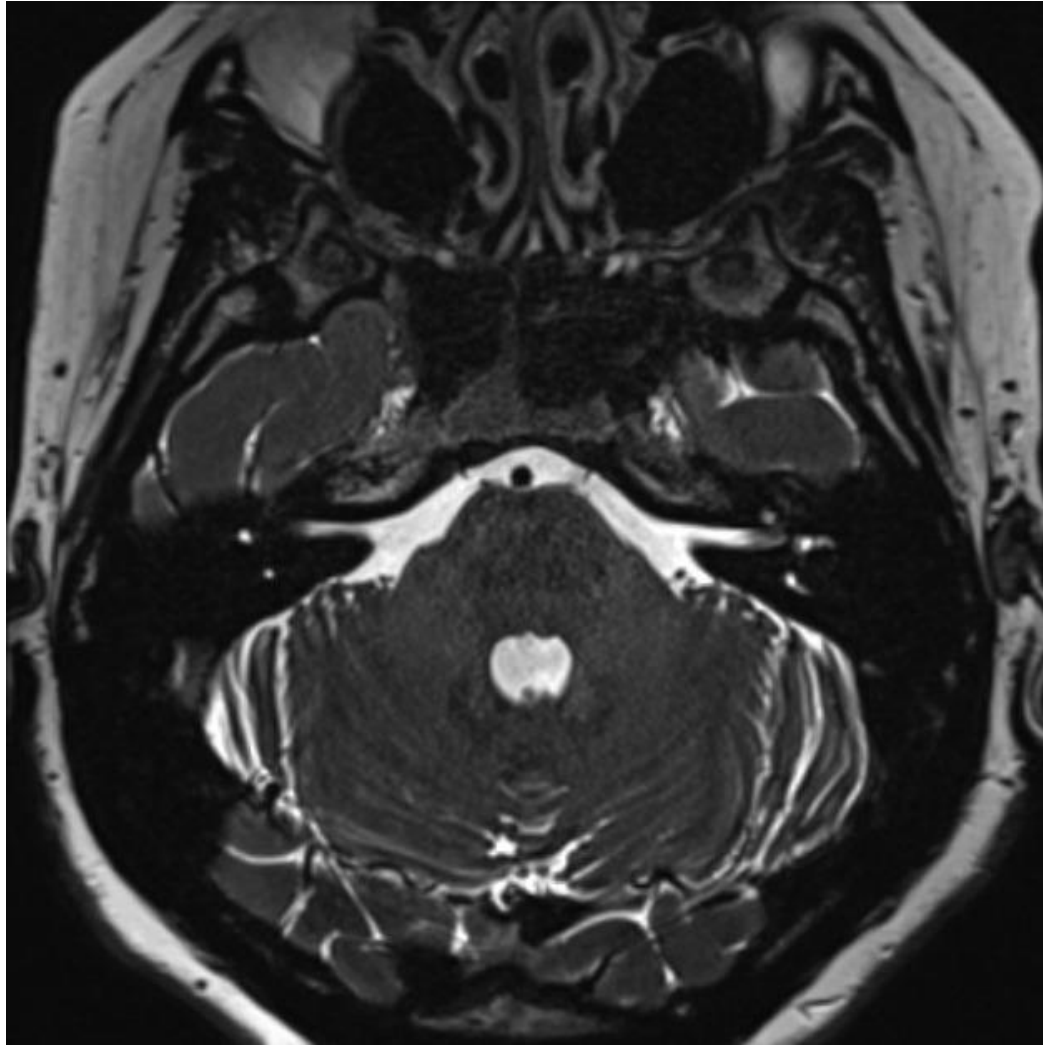
Cochlear Ossification



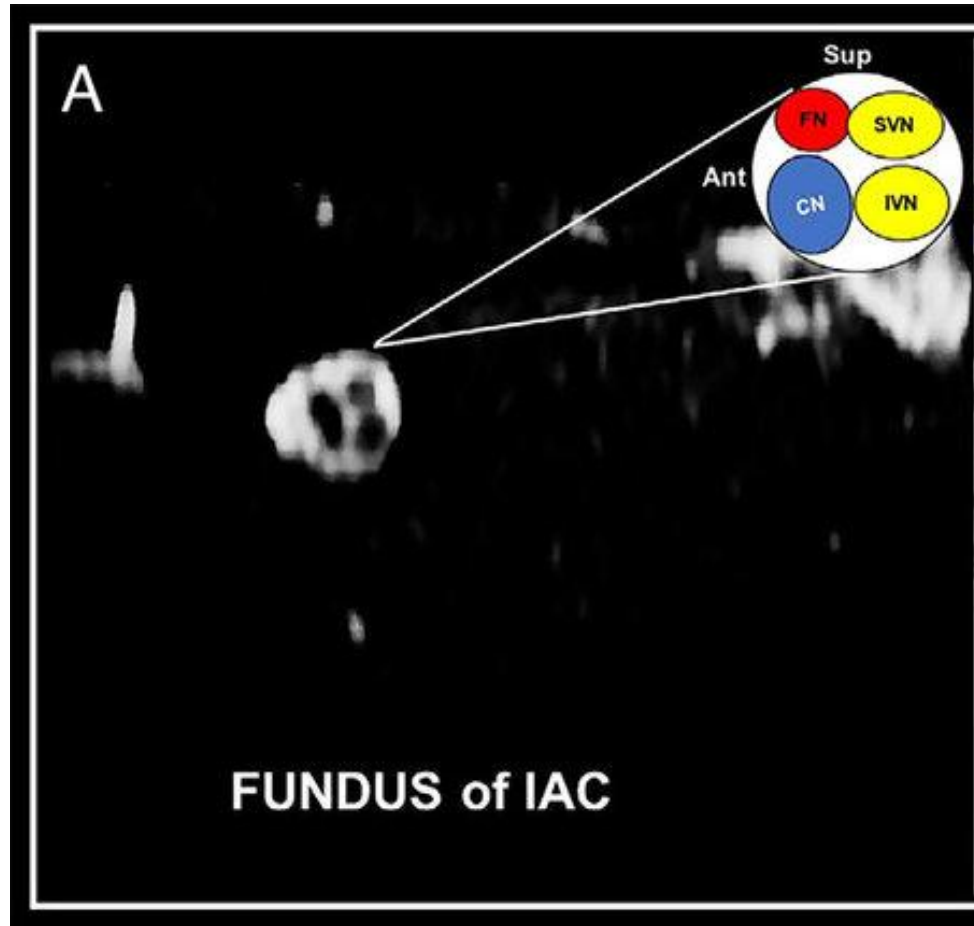
Cochlear hypoplasia/common cavity



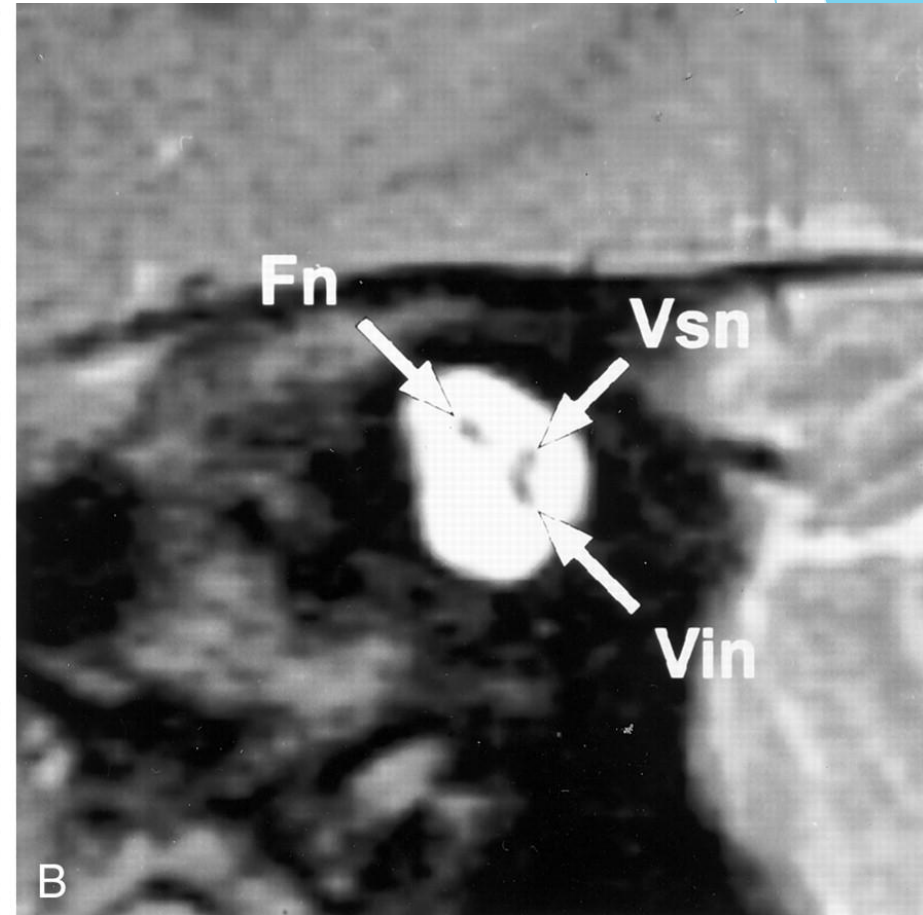
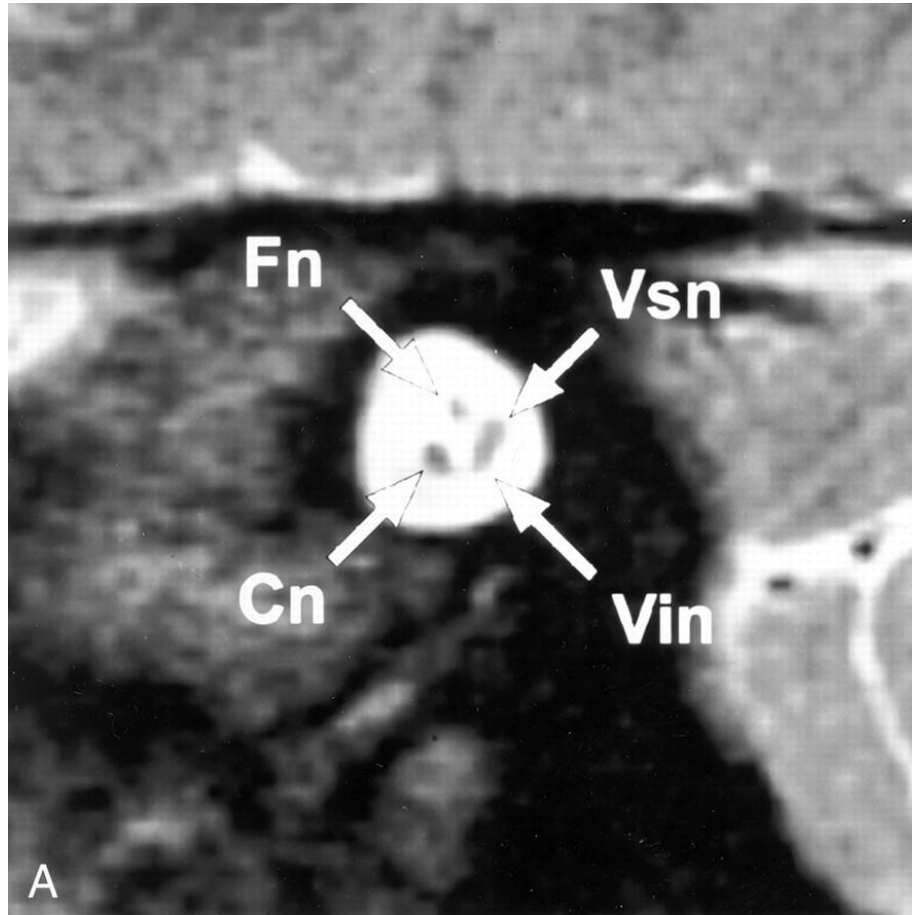
MRI



MRI - IAC protocol



Absent cochlear nerve



Speech/language evaluation

- ▶ Important to work with SLP experienced in working with kids with cochlear implants
- ▶ Overall speech assessment, as well as functional communication assessment
 - ▶ Determine impact of the HL on QoL and communication
- ▶ Plan for listening therapy services post-op

Social determinants/expectations

- ▶ Need to ensure realistic expectations by parents
 - ▶ This varies, depending on patient individual factors
- ▶ Importance of post-op follow-up
 - ▶ Compliance - wearing implant
 - ▶ Routine follow-up with audiology
 - ▶ Adherence to speech plan
- ▶ Social work can be very helpful!

Team approach

- ▶ Ensures follow-up with all specialties
- ▶ Allows for identification/intervention earlier in kids who are struggling
- ▶ Typical follow-up -
 - ▶ 6-8 months post-op (ideally after completing initial course of therapy)
 - ▶ Q6 or Q12 months thereafter, depending on age/individual factors

Thank you!

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