SURGICAL MANAGEMENT IN CHALLENGING OTOSCLEROSIS CASES:

OTOSCLEROSIS & ENDOLYMPHATIC HYDROPS

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Otosclerosis & Hydrops
Overview

- Otosclerosis & Dizziness
- Clinical Features
- Aetiologies of Hydrops with otosclerosis
  - Temporal bone studies
- Investigations
- Managements: When to Operate
- Post operative
  - Hydrops
  - Simulated Hydrops
¼ patients have some dizziness
Most do not have endolymphatic Hydrops

- Types of Dizziness
  - Vague or brief dizziness - resolves after stapedectomy
  - BPPV – improves after Epley manoeuvre and after stapedectomy
  - True Endolymphatic Hydrops
  - Post Operative Endolymphatic Hydrops
    - With fistula
    - Delayed
  - Simulated Post-op Hydrops
Features of True Hydrops with otosclerosis

- Fluctuant hearing levels
- Meniere’s disease like Vertigo attacks
- Aural Fullness, tinnitus
- Possible Hennebert’s sign
- Audiogram:
Temporal bone evidence

- 2007 Anita Pollak, Zurich – 2 bones with hydrops due to *otosclerotic foci obstructing endolymphatic duct* (ref 1)
- 1982 Johnsson et al. – 4 temporal bones with cochleosaccular hydrops at otospongiotic foci, fluid dynamics disturbed. (ref 2)
- 1984 Liston, Paparella et al. (ref 3)
- 1990 Yoon Paparella Schachem 4/128 (3%) temporal bones with *otosclerosis involved VA* and had hydrops, 10/128 (7.8%) had hydrops (ref 4)
- 1990 H Fisch – hydrops due to capsular otosclerosis causing duct obstruction. 18 other cases without hydrops. (5%) ref 5
Personal Series

- Last 200 referrals with Otosclerosis
- Presentation with clinical picture of associated Hydrops in 11 cases
- Incidence at presentation = 5.5 %
Should We Investigate for Hydrops before Surgery?

- No suggestive history – no need

- Suggestive History
  - Electrocochleography (70-85% sensitivity 2002 Shea Ear Clinic) (ref6)

- MRI Scan?
  - Cutting edge inner ear MRI (ref7) Japan
    - 3 Tesla novel phase sequences after Gd
Otology & Neurotology, 2008; 29(4):571-572. Active Otospongiosis & Hydrops (ref8)
Risk of Dead ear

- Dilated Saccule or Reissner’s membrane in contact with footplate
- Intraoperative or post operative rupture
Management of Otosclerosis Associated with Pre-operative Endolymphatic Hydrops

- Confirm with ECOG
- Treat Medically
  - Fluoride
  - Low salt
  - Possible Diuretics, vasodilators or Dexametasone
- Avoid Stapedotomy
  - Hearing aid, BAHA
  - Consider Stapes surgery after 2 years if no symptoms and ECOG returned to normal
  - Only consider stapes surgery if audiogram favourable…..
- If surgery undertaken – Mobilisation or posterior 1/3 small fenestra
Audiometric Contraindication to Stapedotomy

- Poor cochlear function & Good hearing in other ear
- Bone conduction worse than 45dB at 500 Hz and high frequency loss (House group 1984) (ref 9)
Development of Post-Operative Endolymphatic Hydrops

- **Early – with Perilymph Fistula**
  - Leak rate too fast for replacement through cochlear aqueduct, Low CSF pressure syndrome → E Hydrops
  - Management – SURGERY to close fistula

- **Delayed Hydrops**
  - Otospongiotic obstruction of VA/ELS
  - Inner ear scar tissue – obstruction (eg Saccule collapse)
  - Non-suppurative labyrinthitis causes altered fluid production/ drainage (ref 10)

- **Simulated Hydrops**
  - Piston abutting or adherent to saccule – vertigo but not hydrops (-ve ECOG)
Endolymphatic Hydrops occurs secondary to Otosclerosis in about 8% cases presenting for treatment.

If the history is suggestive – Undertake ECOG

Avoid Stapes Surgery with genuine active hydrops

Post-operative Hydrops can develop due to fistulization – if so seal it

Delayed Post-op hydrops is also described and requires conservative management


3. Extensive otosclerosis and endolymphatic hydrops: histopathologic study of temporal bones. Li W. Schachern PA. Paparella MM.


