Comparison of Caloric and vHIT Testing in Patients Implanted with MedEl Flex28 Electrode Using Soft Surgical Techniques

David M. Kaylie MD, Kristal Riska PhD, Doug Garrison AuD
Duke University Medical Center Division of Head and Neck Surgery & Communication Sciences
Disclosure

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Introduction

• Inner ear once considered off limits
  – Stapes surgery
  – CI surgery
    • Techniques evolved
      – Cochleostomy vs. Round window
      – EAS surgery
    • What about vestibular function?
Dizziness after CI

• Many studies looked at impairment of caloric function
  – Incidence of hypofunction ranges 0%-70%
  – Many risk factors looked at
    • Age, surgical approach, electrode
    • Varying degrees of caloric hypofunction
    • Poor correlation patient perception of dizziness

• Long-term disability after CI is low
Caloric Testing Limitations

• Temporal bone anatomy study
  – Heat transferred through bone
  – Less aerated bone correlates with larger caloric response
  – Mastoidectomy alters bone density

• Tasking

• Test re-test reliability
vHIT Benefits

- Test-retest reliability
- Inter-observer reliability
- Independent of temporal bone anatomy
- Better tolerated
- Quicker
- Less expensive equipment
Goals and Methods

• Compare calorics to vHIT in CI patients
  – Uniform surgical technique
  – Uniform electrode
  – Compare to DHI
  – Preop vs 3 month postop

• Recommendations for postop CI testing
Results

• vHIT gain
  – No significant difference preop to postop
  – 0.91 vs 0.85 (p=0.42)

• Caloric UW%
  – No significant difference
  – 16.8 vs 25.9 (p=0.086)

• DHI
  – No significant difference (12.2 vs 12.4 p=0.9)
Results

- Preop and postop vHIT has very strong correlation (0.95)
  - Reflects test-retest
- Preop and postop calorics very weak correlation (0.06)
Discussion

• Using soft surgical techniques and atraumatic electrode
  – Caloric testing and vHIT did not show difference

• Hard to interpret caloric results
  – Caloric data unreliable after surgery
  – Anatomical considerations
  – Wide range in literature
Discussion

• vHIT benefits
  – Shown to be reliable in this study
  – Independent of surgical intervention
  – Better tolerated than patients
  – Quicker and cheaper than calorics

• We recommend that vHIT be the test of choice for assessing vestibular function in CI patients.