A propensity score-matched analysis of residual disease after transcanal totally endoscopic ear versus post-auricular surgery for middle ear and attic cholesteatoma in children

Peter R Dixon MD MSc; Adrian L James DM FRCS
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No disclosures
Visualization vs. instrumentation
Research question

Risk of residual?

Risk of residual?

Risk of residual?
## Cohort

<table>
<thead>
<tr>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt; 18 years</td>
</tr>
<tr>
<td>Post-auricular or TEES</td>
</tr>
<tr>
<td>Middle ear and/or attic</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; look tympanoplasty or Diffusion-weighted MRI or 2-year follow up</td>
</tr>
</tbody>
</table>

EAONO/JOS classification system, Jung et al. 2017

Total $n = 177$

- $n = 112$
- $n = 65$

S2

T
Non-random allocation

**Sex**
- M
- F

**Syndromic**

**Otorrhea**
- Dry

*TEES*
- TEES
- M: 38, F: 15
- TEES
- p = 0.049

*PA + micro*
- PA + micro
- M: 38, F: 15
- Otorrhea
- p = 0.032
- p = 0.047

*Otorrhea*
- p = 0.047
Propensity score match

Standardized Mean Differences (TEES – Post-auricular)

Logit propensity score
  - Age
  - Sex
  - Cleft palate
  - Syndromic
  - Congenital
  - Mills S Stage 1
  - Mills S Stage 2-3
  - Mills O Stage 0
  - Mills O Stage 1
  - Mills O Stage 2-3
  - Wet otorrhea
  - Perforation

- Unmatched
- Propensity-matched

Negligible difference
Residual disease risk

- TEES: 6.3% (4 / 64)
- Post-auricular: 10.9% (7 / 64)

Absolute risk difference (%)

- Favors TEES: -4.7%
- Favors post-auricular
Residual disease risk

- TEES: 6.3% (4/64)
- Post-auricular: 10.9% (7/64)

Absolute risk difference (%): -4.7% (Favors TEES) and 3.7% (Favors post-auricular)
Conclusion

**TEES** is an effective alternative to post-auricular approach for middle ear / attic cholesteatoma in children

Limitations

1. Unmeasured confounding
2. Low event rate
Future directions:

- Improving evidence quality

Strengthen observational evidence

- Standardized data recording
- Multicenter collaboration
- Propensity methods

https://www.ioog.net/
Acknowledgements

Dr. Adrian L James

WCEES Organizers
The main purpose of the IOOG is the creation of a common data set for the otological community that can be used as a standardised system to facilitate international collaboration in research towards improving patient outcomes.
Supplemental slides
<table>
<thead>
<tr>
<th>Characteristic a</th>
<th>Before matching</th>
<th>After matching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TEES (n=65)</td>
<td>PA (n=112)</td>
</tr>
<tr>
<td>Age in years, mean (SD)</td>
<td>9.9 (3.6)</td>
<td>9.9 (3.5)</td>
</tr>
<tr>
<td>Female</td>
<td>33 (50.8)</td>
<td>40 (35.7)</td>
</tr>
<tr>
<td>Cleft palate</td>
<td>6 (9.2)</td>
<td>16 (14.3)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>Syndromic</td>
<td>2 (3.1)</td>
<td>14 (12.5)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>Congenital etiology</td>
<td>17 (26.2)</td>
<td>23 (20.5)</td>
</tr>
<tr>
<td>Saleh and Mills S Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1 - 1 site</td>
<td>35 (53.9)</td>
<td>61 (54.5)</td>
</tr>
<tr>
<td>S2 or S2 – 2 or 3 sites</td>
<td>30 (46.2)</td>
<td>45 (40.2)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>6 (5.4)</td>
</tr>
<tr>
<td>Saleh and Mills O Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O0 - Intact ossicles</td>
<td>28 (43.1)</td>
<td>40 (35.7)</td>
</tr>
<tr>
<td>O1 - Incus erosion + discontinuity</td>
<td>17 (26.2)</td>
<td>31 (27.7)</td>
</tr>
<tr>
<td>O2 or O3 - Incus + stapes arch erosion +/- absent malleus handle</td>
<td>20 (30.8)</td>
<td>39 (34.8)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>Otorrhea at surgery</td>
<td>3 (4.6)</td>
<td>18 (15.2)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>Perforation at surgery</td>
<td>26 (40.0)</td>
<td>49 (43.8)</td>
</tr>
<tr>
<td>Missing</td>
<td>1 (1.5)</td>
<td>1 (0.9)</td>
</tr>
</tbody>
</table>

Abbreviations: TEES, Totally endoscopic ear surgery; PA, Post-auricular approach with operative microscope; SDiff, Standardized difference

a Reports as number (%) unless otherwise specified
<table>
<thead>
<tr>
<th>Cohort</th>
<th>Transcanal totally endoscopic ear surgery</th>
<th>Post-auricular approach with operating microscope</th>
<th>Absolute risk difference</th>
<th>P value</th>
<th>Upper 95% confidence limit of one-tailed absolute risk difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted</td>
<td>4 / 65 (6.2)</td>
<td>12 / 112 (10.7)</td>
<td>-4.6 (-12.7, 3.6)</td>
<td>0.42</td>
<td>2.3</td>
</tr>
<tr>
<td>Propensity-matched</td>
<td>4 / 64 (6.3)</td>
<td>7 / 64 (10.9)</td>
<td>-4.7 (-14.8, 5.4)</td>
<td>0.37</td>
<td>3.7</td>
</tr>
</tbody>
</table>
O0 – Intact ossicular chain
O1 – Erosion of incus, intact stapes arch
O2 – Erosion of incus + stapes arch
O3 – Erosion of stapes arch, absent malleus hand + incus