Ear Drums: Normal vs Abnormal

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Disclosures

• Respiratory Intelligence Inc.
  • Shareholder, Board Member
• 2 Patents in review
Tympanosclerosis: Does One Ever Intervene?

History

- 8 year old boy with history of 2 sets of ear tubes, adenoidectomy and recurrent AOM presents with subjective complaints of left sided hearing loss.
- Denies otorrhea
- Last set of ear tubes were placed 2 year ago
Audio and Ear Exam

• Right ear: patent tube, no tympanosclerosis
• Left ear: Tympanosclerosis, of entire TM
An Analysis of Surgical Treatment Results of Patients With Tympanosclerosis

- 151 ears with tympanosclerosis
- Significant increase in ABG in most patients

### Table 1. Median Values and ABG Gain of Wielinga-Kerr Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Preoperative AC</th>
<th>Postoperative AC</th>
<th>Preoperative BC</th>
<th>Postoperative BC</th>
<th>Preoperative ABG</th>
<th>Postoperative ABG</th>
<th>ABG Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36.5</td>
<td>20</td>
<td>15</td>
<td>14.5</td>
<td>19.5</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>30</td>
<td>15</td>
<td>11</td>
<td>30</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>49</td>
<td>40</td>
<td>21</td>
<td>23.5</td>
<td>30.5</td>
<td>23</td>
<td>7.5</td>
</tr>
<tr>
<td>4</td>
<td>49</td>
<td>38</td>
<td>18</td>
<td>14</td>
<td>30</td>
<td>21</td>
<td>9</td>
</tr>
</tbody>
</table>

AC, air conduction; BC, bone conduction; ABG, air-bone gap.

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Tympanic Membrane Retraction **Without** Cholesteatoma
Myringostapediopexy: Is it a Natural Type III Tympanoplasty?

- 47 unoperated ears (adults and children)
- Cross sectional study, audiograms
- CHL >25 considered clinically relevant for ossiculoplasty
- 53% of patients had clinically normal hearing

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>Mean conductive hearing loss (standard deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>21.28 (11.99)</td>
</tr>
<tr>
<td>1,000</td>
<td>19.79 (10.57)</td>
</tr>
<tr>
<td>2,000</td>
<td>15.64 (8.70)</td>
</tr>
<tr>
<td>3,000</td>
<td>14.13 (8.90)</td>
</tr>
<tr>
<td>4,000</td>
<td>19.13 (11.15)</td>
</tr>
</tbody>
</table>

Huttenbrink KB. A new theory interprets the development of a retraction pocket as a natural self-healing process.

Karl-Bernd Huttenbrink

- 239 planned 2nd look procedures

Table 3  Peculiarities in the clinical experience of a localized cholesteatoma

A cholesteatoma develops from a retraction pocket of the epitympanic and posterior pars tensa of the tympanic membrane.
In the epitympanic cholesteatoma, the pars tensa is unsuspicious, with an air-filled cavity and healthy mucosa.
In a retraction of the posterior pars tensa (sinus cholesteatoma), the anterior tympanic membrane as well as the epitympanic space are air-filled and unsuspicious.
The retraction of the tympanic membrane can occur above an epitympanon/antrum/posterior pars tensa, filled with granulation tissue, which cannot develop an underpressure.
A grommet will not stop the progression of an epitympanic cholesteatoma.
A retraction pocket with sufficient self-cleaning, without inflammation of the skin of the tympanic membrane, can remain stable above healthy mucosa without further deepening and development of a cholesteatoma.
The retraction of a recurrent cholesteatoma can develop despite a stabilization of the reconstructed tympanic membrane with cartilage.
Retraction pocket and early cholesteatoma

Cholesteatoma
Summary

• Option of accepting a new normal in the operated or unoperated ear if certain conditions are met
• Tympanosclerosis and myringostapediopexy are examples
• Other examples:
  • Chronic asymptomatic perf with thin atrophic TM
  • Serous OM with normal hearing
  • Retraction pocket without keratin debris
• Hearing aid, BAHA, eustachian tube dilation
• Long term follow up and shared decision making model