Open, Closed, Obliteration techniques in cholesteatoma surgery

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OPEN techniques

• Radical Mastoidectomy

• Radical Mastoidectomy with tympanoplasty

Safe procedure but Cavity Problems

• Radical Mastoidectomy with mastoid obliteration (Domenech, Rambo, Palva....)
Cholesteatoma: infectious process

• 1888 Kurster, Bergmann 1890 Stacke
• 1893 Zaufal, Stacke, Schwartz
• 1894 Janssen, Scheibe Ossicles
• 1894 Siebenmann Tympanic membrane
• 1904 Heath Modified radical mastoidectomy
• 1908 Bondy Conservative radical mastoidectomy

Open techniques basic concepts

TROUBLEsome mastoid cavity

Large meatoplasty
Facial ridge down
Radical Mastoidectomy with mastoid obliteration

- To decrease the mastoid size
- To normalize the EAC size (open technique)

Large cavity to small cavity (open technique)

<table>
<thead>
<tr>
<th>Canal-wall down technique</th>
<th>172</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cody D &amp; Taylor W (1987)</td>
<td>65</td>
<td>13</td>
</tr>
<tr>
<td>Sade J (1987)</td>
<td>259</td>
<td>5,8</td>
</tr>
</tbody>
</table>

Obliteration following Canal Wall down technique

| Ramsey MJ et al (2004)                           | 60  | 0     |
| Singh V and Atlas M (2007)                       | 51  | 0     |
| Yung et al. (2007)                               | 102 | 4,9   |
technical evolution

- 1958 Rambo: Obliteration
- 1961 Hermann
- 1963 Goodhill: Perichondrium
- 1967 Jansen: Posterior tympanotomy
  Sheehy: Intact Canal Wall
  Smith: Combined approach
- 1968 Portmann: Open/Closed techniques

CLOSED techniques

(closed technique)

- No Mastoid Cavity
- Intact Canal Wall technique (*Jansen, Sheehy...*)

Safe ear but Residual & Recurrence
Basis of Intact Canal Wall technique

1. To preserve or restore canal wall (no mastoid cavity)
2. To respect or increase mastoid «Gaz reservoir»

Skin EAC self-cleaning
Poor ventilating ET function
Middle ear mucosa gas-exchange

1970 / 1980

*Cholesteatoma comes from the bottom of the ear canal*

WRONG SKIN in A WRONG PLACE

1- Remove it
2- Prevent from coming back

Residual

Recurrence
### Results Canal wall up (closed technique)

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients</th>
<th>residual</th>
<th>recurrent</th>
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<tbody>
<tr>
<td>Sanna M et al. (1987)</td>
<td>151</td>
<td>40</td>
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<tr>
<td>Charachon R et al. (1988)</td>
<td>160</td>
<td>31</td>
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<td>Magnan J et al. (1992)</td>
<td>210</td>
<td>26</td>
<td>19.5</td>
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<td>Schilder A et al. (1997)</td>
<td>103</td>
<td>23</td>
<td>18</td>
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<tr>
<td>Darrouzet V et al. (2000)</td>
<td>190</td>
<td>20.5</td>
<td>8.9</td>
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</table>

### OBLITERATIVE techniques

<table>
<thead>
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<th>Study</th>
<th>Patients</th>
<th>residual</th>
<th>recurrent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercke U (1987)</td>
<td>57</td>
<td>5.3</td>
<td>0.3</td>
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<tr>
<td>Gantz B et al (2005)</td>
<td>130</td>
<td>9.8</td>
<td>1.3</td>
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<tr>
<td>Lee WS et al (2005)</td>
<td>151</td>
<td>5.4</td>
<td>0.3</td>
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<tr>
<td>Vercreysse JP et al. (unpublished)</td>
<td>281</td>
<td>3.5</td>
<td>1.3</td>
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</table>
OBLITERATION techniques

Basis of Intact Canal Wall technique with mastoid and attic obliteration

Reducing the middle ear cavity volume: adapt middle ear mucosa gas-exchange to the inadequate ET ventilating function
Intact Canal Wall technique with mastoid and attic obliteration

Canal up
Bone chips + bone paté
Cartilage

Residual risk?

Residual rate drastically dropped (Offeciers)
Animal study (Hinohara)
Non-EPI diffusion MRI (Casselman)

Extended Cholesteatoma

Combined A. Closed Techn.
Silastic

Second look
No recurrence
Recurrence
conclusion

In the past

Failure of closed technique → open technique

Now

Failure of closed technique → obliterative technique