Cochlear implantation of the "poorer" or the "better" ear in the elderly population: Does it matter?

Luis Lasaletta, Miryam Calvino, Isabel Sánchez-Cuadrado, Mario Zernotti, Rosa Pérez-Mora, Javier Gavilán

Department of Otolaryngology
“La Paz” University Hospital
Madrid, Spain.
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Lasaletta 2016. Cochlear implantation of the "poorer" or the "better" ear in the elderly population
1. Does “elderly” mean worse hearing results and worse QOL?
2. Does the choice of ear have an effect on CI performance? CI in the better or worse ear?

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CI in the elderly: Choice of ear

Max SDS=0%

Max SDS=40%

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CI in the elderly: Choice of ear

**Worse ear**
- Contralateral residual hearing permits bimodal stimulation

**Better ear**
- Shorter duration of deafness and larger amount of residual hearing are prognostic factors

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Patients

212 CI adults

73 adults aged ≥ 60 years

42 with residual hearing

More than 6 months of unilateral CI experience

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Patients

- Age at implantation: 68.8 y (60-80y)
- Duration of deafness: 24y (1-63y)
- Experience with the CI: 45.2m (9-148m)

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Methods

Audiological tests

- Pure-tone audiometry
- Speech audiometry (aided, 65 dB)

Glasgow Benefit Inventory (GBI)

- 18 questions
- 3 subscales
- +100 to -100

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Methods

**HISQUI**

<table>
<thead>
<tr>
<th>Always (99%)</th>
<th>Almost always (87%)</th>
<th>Frequently (75%)</th>
<th>Mostly (50%)</th>
<th>Occasionally (25%)</th>
<th>Rarely (12%)</th>
<th>Never (1%)</th>
<th>N/A</th>
</tr>
</thead>
</table>

**Achieved Total Score**

<table>
<thead>
<tr>
<th>Sound Quality</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>very poor sound quality</td>
<td>&lt; 60</td>
</tr>
<tr>
<td>poor sound quality</td>
<td>60 - 90</td>
</tr>
<tr>
<td>moderate sound quality</td>
<td>90 - 120</td>
</tr>
<tr>
<td>good sound quality</td>
<td>120 - 150</td>
</tr>
<tr>
<td>very good sound quality</td>
<td>150 - 203</td>
</tr>
</tbody>
</table>

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Criteria for “better” vs. “poorer” ear

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Criteria for “better” vs. “poorer” ear

C1 (Chen, 2001): Use of hearing aid

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Criteria for “better” vs. “poorer” ear

C2 (Lazard 2012): Best PTA of both ears.
Ranges: 40-49, 50-59, 60-69, 70-79, 80-89, 90-99 and ≥100dB.

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Criteria for “better” vs. “poorer” ear

C3 (Rubinstein, 1999): Maximum SDS prior to surgery

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CI in the elderly: Choice of ear

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CI in the elderly: Choice of ear

Lassaletta 2016. Cochlear implantation of the "poorer" or the "better" ear in the elderly population

<table>
<thead>
<tr>
<th>Criteria C1</th>
<th>Criteria C2</th>
<th>Criteria C3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SDS (%)</strong></td>
<td><strong>SDS (%)</strong></td>
<td><strong>SDS (%)</strong></td>
</tr>
<tr>
<td>All patients</td>
<td>Better ear-implanted</td>
<td>Poorer ear-implanted</td>
</tr>
<tr>
<td>(n = 42)</td>
<td>(n = 11)</td>
<td>(n = 9)</td>
</tr>
<tr>
<td>16.9 ± 21.2</td>
<td>17.7 ± 14.0</td>
<td>6.7 ± 20.0</td>
</tr>
<tr>
<td>(0–85)</td>
<td>(0–40)</td>
<td>(0–60)</td>
</tr>
<tr>
<td>n patients with SDS = 0%</td>
<td>n patients with SDS = 0%</td>
<td>n patients with SDS = 0%</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>117.4 ± 8.6</td>
<td>120.0 ± 0.0</td>
<td>116.7 ± 10.0</td>
</tr>
<tr>
<td>(80–120)</td>
<td>(90–120)</td>
<td>(80–120)</td>
</tr>
<tr>
<td>n patients with SRT = 120 dB</td>
<td>n patients with SRT = 120 dB</td>
<td>n patients with SRT = 120 dB</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>98.5 ± 16.3</td>
<td>96.7 ± 15.8</td>
<td>101.1 ± 18.7</td>
</tr>
<tr>
<td>(63–120)</td>
<td>(63–120)</td>
<td>(67–120)</td>
</tr>
<tr>
<td>n patients with PTA = 120dB</td>
<td>n patients with PTA = 120dB</td>
<td>n patients with PTA = 120dB</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Age at surgery (years)</td>
<td>Age at surgery (years)</td>
<td>Age at surgery (years)</td>
</tr>
<tr>
<td>68.8 ± 5.4</td>
<td>71.4 ± 4.6</td>
<td>67.2 ± 5.0</td>
</tr>
<tr>
<td>Duration of hearing loss (years)</td>
<td>Duration of hearing loss (years)</td>
<td>Duration of hearing loss (years)</td>
</tr>
<tr>
<td>24.0 ± 17.1</td>
<td>26.2 ± 14.0</td>
<td>30.9 ± 18.2</td>
</tr>
</tbody>
</table>

Data expressed as mean ± SD (range).
Results

C1 (Chen, 2001): Use of hearing aid

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Results

C2 (Lazard 2012): Best PTA of both ears.

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Results

C3 (Rubinstein, 1999): Maximum SDS

Audiological results

QOL results

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CI in the elderly: Choice of ear

Worse ear better?

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Conclusions

• No significant difference in terms of hearing outcomes, QOL or quality of sound among elderly CI patients comparing the better and the poorer ear
• The results were constant irrespective of the criteria used to define better and poorer ears
• Implantation of the poorer side is unlikely to reduce the CI performance significantly

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