Longterm hearing preservation outcome with different flexible lateral-wall Cochlear-Implant electrodes

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**Conclusion**

Stable hearing preservation is possible over a long postoperative period of time in the majority of patients with all flexible lateral-wall electrodes with different length. Higher percentage of good hearing preservation was found for shorter electrodes and lowest median hearing loss in patients with the shortest electrode.

**Introduction**

Due to the characteristics of lateral-wall cochlear implants, MED-EL Flex 20\(^{20}\), Flex 24\(^{24}\) and Flex 28\(^{28}\), can be used to preserve residual hearing.

**Aim of the study:**

Determine the development of hearing preservation over a longitudinal postoperative period and its relation to electrode length.

**Methods**

**Study design:**
- retrospective analysis
- 215 adults with preoperative residual hearing (≥ 80dB 125-1000Hz)
- Cochlear-Implantation

**Measurements:**
- pre- and postoperative (after 1, 12 and 24 month) pure tone audimetry (125-1000Hz)
- median hearing loss (HL) was determined
- pre-to postoperative pure tone average

<table>
<thead>
<tr>
<th>median HL (125-1000Hz)</th>
<th>low-frequency HL (125-1000Hz)</th>
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<td>≤15 dB</td>
<td>≤15 HL ≤30 dB ≤30 dB</td>
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**Results**

- **Image 1:** Flexible lateral-wall Cochlear-Implant electrodes.

- **Image 2:** Pure tone audiogram with preoperative hearing thresholds of the patients implanted with Flex 20, 24 and 28 electrodes.

- **Image 3a:** Median HL and low-frequency HL after 1 month.

- **Image 3b:** Median HL and low-frequency HL after 24 month.

<table>
<thead>
<tr>
<th>1 month</th>
<th>12 month</th>
<th>24 month</th>
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<tbody>
<tr>
<td>MED-EL® FLEX 20</td>
<td>MED-EL® FLEX 24</td>
<td>MED-EL® Flex 28</td>
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<tr>
<td>12 electrode contacts, length: 20mm</td>
<td>12 electrode contacts, length: 24mm</td>
<td>12 electrode contacts, length: 28mm</td>
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Image 2: Flexible lateral-wall Cochlear-Implant electrodes.

**Future Research:**

Analysis of influencing factors on postoperative hearing preservation: Intraoperative factors, patient related factors, anatomy of the cochlear.

Hearing preservation is possible for all flexible lateral-wall electrodes and is nearly stable up to 24 month.

The lowest median HL and the highest percentile for good hearing preservation for all time points was found for the shortest electrode.