Otoplan data and intraoperative findings correlation in ossified cochleae

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Ossification

• In vast majority of cases – the ossification starts from RW membrane and the descending part of the basal turn is primarily affected
Measurements results

- RW membrane (    ) – U-turn (    ) – 8,0 mm.
- Cochleostomy site (    ) – U-turn – 6,1 mm.
- Spiral canal diameter - 1,27 mm, in basal turn – 1,7 mm.
Surgical options

- partial implantation
- double-array implantation
- scala vestibuli implantation
- cochleostomy
- drilling from RW

Ossification extension matters!

risks

- incomplete insertion
- carotid artery alteration
- modiolus trauma

1 Balkany T., Gantz B.J., Nadol J.B. Multi-channel cochlear implants in partially ossified cochleas
2 Cohen N.L., Waltzman S. Partial insertion on the nucleus multichannel cochlear implant: technique and result.
3 Gantz B.J., McCabe B.F., Tyler R.S. Use of multichannel cochlear implants in obstructed and obliterated cochleas
4 Steenerson R.L., Gary L.B. Multichannel cochlear implantation in obliterated cochlear using the Gantz procedure.
5 Nucleus double electrode array: a new approach for ossified cochlea / Lenarz T. [et al.]
Objective

• to assess the correlation between the data obtained with the use of Otoplan and intraoperative findings in terms of the spiral canal ossification length
Methods

• 19 consecutive post-meningitic patients with the ossification of the descending part of the basal turn
• ossification length was measured
  - preoperatively by means of Otoplan (CT 1 day before surgery)
  - intraoperatively with the help of original silicone gauge (measurement value - 0,5 mm; the maximum calibrated length - 10 mm)
Otoplan measurements
IntraOp gauge
(measurement value - 0.5 mm;
maximum calibrated length - 10 mm)
CI in basal turn ossification

- Wide posterior tympanotomy
- Start from RW niche
- Follow the scala tympani
- Main landmarks:
  - basal turn lateral wall
  - color difference between otic capsule (yellowish) and ossification (whitish)
- Use standard electrode
Intraop measurements

• The superior portion of RW rim was left intact to be the landmark for further intraop measurements
• Enables safe drilling of the basal turn and minimizes risk of modiolus and ICA damage
## Results

<table>
<thead>
<tr>
<th></th>
<th>Otoplan</th>
<th>Intraop</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean ossification length</td>
<td>4,5 mm</td>
<td>4,7 mm</td>
</tr>
<tr>
<td>the longest ossification</td>
<td>6,5 mm</td>
<td>6,5 mm</td>
</tr>
<tr>
<td>the biggest difference</td>
<td></td>
<td>0,4 mm</td>
</tr>
<tr>
<td>mean difference</td>
<td></td>
<td>0,2 mm</td>
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</tbody>
</table>
Conclusions

• The strong correlation between the Otoplan data and intraoperative findings in terms of basal turn ossification length measurements can suggest Otoplan as a perfect diagnostic tool.

• The use of the original intraoperative gauge enables safe drilling of the ossification improving surgeon’s spatial orientation.
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