LATERALIZED PISTON SYNDROME

B. FRAYSSE,
DEFINITION

- Lateral displacement of the piston, with partial erosion of the incus and closing of the stapedotomy hole
CLINICAL SYMPTOMS

- Delayed post operative conductive hearing loss
- Hearing fluctuation improved after Valsalva
- Otoscopy: prosthesis loop against the tympanic membrane
PURE TONE AUDIOGRAM

Postoperative audiogram

Secondary conductive hearing loss

Mean Air Conductive: 60 dB
RADIOLOGICAL FINDINGS

- Positive focus in 94%
- Position of the piston nearby the tympanic membrane
- Piston out of the stapedotomy hole
SURGICAL FINDINGS

- Lateral displacement of the piston in the axis of the stapes. No or partial erosion of the incus

- Closing of the stapedotomy hole
LATERALIZED PISTON SYNDROME
POPULATION

2180 surgeries
1993 - 2013

202 Revisions
9%
REVISION SURGERY

Number of revisions

- RW obliteration
- Too long piston
- Eroded Incus
- Perilymphatic fistula
- Incus/malleus fixation
- Otosclerosis regrowth
- Fibrous adhesions/Granuloma
- Lateralized piston
- Prosthesis displacement

Lateralized piston n: 44 cases (22%)

202 cases
Mean interval between first surgery and revision: 12 years

Surgical technique
- Under local anesthesia
- Laser stapedotomy
- Piston (84%) vs TORP (16%)
- Use of cement in 20 cases
- Length of the piston + 0.5 mm
## OVERALL RESULTS

<table>
<thead>
<tr>
<th>Rinne</th>
<th>Patients N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 10 dB</td>
<td>19</td>
<td>41%</td>
</tr>
<tr>
<td>≤ 20 dB</td>
<td>40</td>
<td>87%</td>
</tr>
<tr>
<td>No improvement</td>
<td>5</td>
<td>9%</td>
</tr>
<tr>
<td>Decrease in hearing</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>
# RESULTS – TYPE OF PISTON

<table>
<thead>
<tr>
<th></th>
<th>Conventional piston</th>
<th>Curved piston</th>
<th>TORP</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>31</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Rinne ≤ 10 dB</td>
<td>48%</td>
<td>55%</td>
<td>0</td>
</tr>
<tr>
<td>Rinne ≤ 20 dB</td>
<td>93%</td>
<td>85%</td>
<td>50%</td>
</tr>
</tbody>
</table>

NS

Significant $p < 0.05$
## RESULTS CEMENT VS NO CEMENT

<table>
<thead>
<tr>
<th>Rinne</th>
<th>Rinne ≤ 10 dB</th>
<th>Rinne ≤ 20 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>With cement (N 20)</td>
<td>40%</td>
<td>90%</td>
</tr>
<tr>
<td>Without cement (N 26)</td>
<td>46.2%</td>
<td>84.6%</td>
</tr>
<tr>
<td>« p » value</td>
<td>p = NS</td>
<td>p = NS</td>
</tr>
</tbody>
</table>
PHYSIOPATHOLOGY

1. Too short piston and excessive air pressure changes in the middle ear
   (Farrior.B; Ann Otol Rhinol Laryngol 1981: 90;636-9)

2. Excessive inner ear pressure changes
   (Farrior.B; Ann Otol Rhinol Laryngol 1981: 90;636-9)

None radiological abnormalities of the inner ear

3. Eversion of the lining membrane of the vestibule
   (Shea.JJ; Laryngoscope 1974: 84(7);1122-34)
CONCLUSION

- Lateralized piston syndrome is not rare 22%
- Early detection may avoid incus necrosis
- The cause may be a large compliance of the tympanic membrane with a short piston
- The surgical technique consists of a prosthesis on the long process of the incus with or without cement
- The overall results: 87% of patients within 20dB
Thank you for your attention

IFOS WORLD MASTER COURSE ON HEARING REHABILITATION