Significance of increased initial pB-C2 distance on radiographic outcomes in Chiari Type 1 malformation

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No disclosures to report
Vertebral Brainstem Compression

- Ventral brainstem compression (VBSC) reportedly occurs in 4-31% of patients with Chiari type 1 malformation.
- Treatment of VBSC can be morbid
  - Traction and fusion
  - Odontoidectomy
Grabb-Oakes line (pB-C2 measurement)

- Plumb line extending from basion to posterior-inferior body of C2
- Distance from this line to posterior dens is pB-C2 measurement

Study

Chiari 1 malformation
Surgery in 2003 – 2006
Pre- and post-op imaging available

54 patients

46 patients
pB-C2 <9mm

8 patients
pB-C2 >9mm
# Demographics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30 (56%)</td>
</tr>
<tr>
<td>Female</td>
<td>24 (44%)</td>
</tr>
<tr>
<td>Age (median)</td>
<td>10 years</td>
</tr>
<tr>
<td>Follow-up (median)</td>
<td>36 months</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th></th>
<th>Mean pre-operative pB-C2</th>
<th>Mean post-operative pB-C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td>6.1 mm</td>
<td>6.1 mm</td>
</tr>
<tr>
<td>Patients with pre-op pB-C2 &lt;9mm</td>
<td>5.5 mm</td>
<td>5.8 mm</td>
</tr>
<tr>
<td>Patients with pre-op pB-C2 &gt;9mm</td>
<td>9.4 mm</td>
<td>8.0 mm</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Change in pB-C2</th>
<th>95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients with pre-op pB-C2 &lt;9mm</strong></td>
<td>+0.3 mm</td>
</tr>
<tr>
<td><strong>Patients with pre-op pB-C2 &gt;9mm</strong></td>
<td>-1.2 mm</td>
</tr>
</tbody>
</table>
Results

Pre-op

2 years post-op
Results

pB-C2 (mm)
Results

pB-C2 (mm)
Results

- No difference in terms of resolution of syrinx between groups
- Single patient with VBSC progressed and required additional surgery
Conclusions

• There is little overall change in pB-C2 or ventral brainstem compression following a standard posterior craniocervical decompression for Chiari 1 malformation.

• While not statistically significant, there is actually a trend towards a reduction in ventral brainstem compression in patients with pre-operative VBSC.

• While some patients may require additional treatment, most patients with VBSC can safely be treated initially with posterior decompression alone.
Thank you!