Chiari Malformation with Spinal Pathology: Reoperation Rates Following Surgical Decompression Versus Fusion

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Disclosures

• No relevant disclosures
• All disclosures can be found on http://www7.aaos.org/education/disclosure/search
Introduction

• Cranial and spinal surgical decompressions, with and without fusions, are useful in reducing the associated increased cerebrospinal pressure experienced by CM patients.

• The number of surgical corrections performed for CM patients is increasing, therefore, there is value in understanding outcomes, in the context of reoperations.

Figure 1. MRI of the cervical spine demonstrating a Chiari 1 malformation (red arrow) extending down to the C2 level with an associated 13 mm cervical syrinx (white arrow).
Methods

- Retrospective analysis of the prospectively collected California State Inpatient Database (CASID) years 2003-2011.
- Patients were included in the analysis if they had a diagnosis of Chiari Malformation (CM) Types 1-4 in addition to undergoing treatment with $\geq 1$ spinal decompression and/or spinal fusion.
- Each patient was analyzed based on presence of one or more surgical procedures and the respective sequence of decompression and fusion.
- Descriptives and chi-square analyses assessed differences in reoperation rates between CM patients with an index surgery of decompression only vs CM patients with an index surgery of fusion with or without decompression.
Results

- 27,126 patients with Chiari Malformation types 1-4 were initially included in this analysis.
  - Type 1: 14,995
  - Type 2: 7,003
  - Type 3: 792
  - Type 4: 4,336
- Surgical decompression: 13,422
- Fusion: 1,131
- Decompression and Fusion: 147 patients underwent both decompression and fusion at any time-point.
## Results

<table>
<thead>
<tr>
<th>Initial CMT14 Population</th>
<th>Type 1</th>
<th>Type 2</th>
<th>Type 3</th>
<th>Type 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients</td>
<td>14,995</td>
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</tr>
</tbody>
</table>

### Surgical Procedures

<table>
<thead>
<tr>
<th></th>
<th>Surgical Decompression</th>
<th>Fusion</th>
<th>Decompression/Fusion</th>
</tr>
</thead>
<tbody>
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<td>Initial Number of Patients</td>
<td>13,422</td>
<td>1,131</td>
<td>147</td>
</tr>
<tr>
<td>Number of Patients Included in Analyzed Cohort</td>
<td>1,446</td>
<td>151 (70%)</td>
<td>151 (30%)</td>
</tr>
</tbody>
</table>
Results

• Within this cohort, 1,597 patients had unique visit link code data available for analysis across time.

• Decompression only pts were on average younger than fusion pts (21.9 vs 31.5 years) with less neurological comorbidity burden (3.89% vs 9.1%, all p<0.001).

• Within the decompression only cohort, 58 patients (4.01%) required re-operation following their index decompression for a total of 70 reoperations.
  – 13 were conversions to fusions and 57 were re-decompressions.

• Within the fusion cohort, 10.59% required re-operation following their index fusion surgery.
  – Most being revision decompression as their re-operative procedure.
Discussion

• In rare cases of Chiari, the malformation also comes along with instability of the joint between the base of the skull and the top of the spine.
  – In these cases, an additional procedure, a fusion between the base of the skull and the top of the spine, is needed.

• Despite the commonly held perception that fusion enhances durability, our findings suggest fusion surgery with or without decompression is associated with higher rates of re-operation compared to decompression alone.
Conclusions

• Chiari patients with concomitant spinal pathologies requiring surgery underwent stand-alone decompression most often, followed by fusion with or without decompression.

• Patients undergoing isolated decompression should expect a small but insignificant rate.