INTRODUCTION

• Hemispherectomies, hemispherotomies and lobectomies are neurosurgical procedures used to treat drug resistant (intractable) epilepsy.¹, ²
• They are effective in improving seizure control, but can produce significant functional deficits – including neuromuscular ones like hemiparesis¹

OBJECTIVE

1. To better catalogue and quantify the orthopedic sequelae of hemispherectomies, hemispherotomies and/or lobectomies
2. Identify pre-operative risks to help guide post-operative follow-up care

METHODS

• A retrospective chart review of 168 pediatric patients who underwent a hemispherectomy, hemispherotomy and/or lobectomy was conducted
• Cases from 2001 to 2020 were analyzed longitudinally to determine:
  • Pre-op neurological conditions
  • Post-op physical exam findings
  • Post-op orthopedic outcomes
  • Orthopedic follow-up for those affected
  • Post-op interventions
• Patient data was summarized using mean, frequency and/or relative frequency as appropriate
• Controlling for pre-operative neurological conditions, multivariate logistic regression was used to correlate new post-op orthopedic conditions with predictive variables
• Stata/IC was used for statistical computation with p < 0.05 considered statistically significant

RESULTS

<table>
<thead>
<tr>
<th>Pre-op neurological diagnoses</th>
<th>No orthopedic condition</th>
<th>New orthopedic condition (post-op)</th>
<th>Prior orthopedic condition (pre- and post-op)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intractable epilepsy (n=162)</td>
<td>38.3%</td>
<td>50.0%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Infantile spasms (n=29)</td>
<td>34.5%</td>
<td>58.6%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Cortical dysplasia (n=20)</td>
<td>45.0%</td>
<td>55.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Neoplasm (n=20)</td>
<td>60.0%</td>
<td>35.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Tuberous sclerosis (n=20)</td>
<td>52.9%</td>
<td>47.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Rasmussen's encephalitis (n=13)</td>
<td>7.7%</td>
<td>84.6%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Perinatal stroke/infarct (n=11)</td>
<td>0.0%</td>
<td>27.3%</td>
<td>62.7%</td>
</tr>
<tr>
<td>Temporal sclerosis (n=5)</td>
<td>100.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hemimegalencephaly (n=4)</td>
<td>0.0%</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

• Younger age (at the time of surgery) was significantly associated with the development of new orthopedic conditions (AOR 0.982, 95% CI 0.974–0.989, p < 0.001)
• Undergoing repeat/revision neurosurgery was significantly associated with the development of new orthopedic conditions (AOR 2.66, 95% CI 1.109–6.395, p 0.028)

CONCLUSION

• Pediatric patients are subject to a significant burden of post-operative orthopedic disease status post hemispherectomy, hemispherotomy and/or lobectomy
• Only 29.3% of those with a new orthopedic complication received orthopedic follow-up
• There is an apparent gap between the need for and provision of orthopedic care in this population
• Younger age and repeat/revision neurosurgery was predictive of increased risk of developing a post-op orthopedic condition
• Further review with a neurosurgical focus may elucidate more controllable predictive variables
• Orthopedic follow-up is encouraged given the overall prevalence of disease burden in this population

LIMITATIONS

Some charts lacked post-discharge follow-up notes, meaning the amount of orthopedic follow-up, incidence of post-op orthopedic conditions and/or the number of conditions that resolved over time may be higher than reported.

REFERENCES