Ultrasound-Guided Serratus Plane Block For Video-Assisted Pectus Excavatum Repair: A Novel Approach To Postoperative Pain Management

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Introduction

- Video-assisted pectus excavatum repair (VAPER), is associated with significant chest wall pain and a large peri-operative consumption of opioids.
- The efficacy of the ultrasound guided serratus plane block (SAP) in providing analgesia of the hemithorax was studied.
- Comparison of outcomes of patients undergoing VAPER who received SAP to those without regional nerve block.

Methods

- Retrospective review of 31 patients ages 12 to 22 who underwent VAPER from February 2014–August 2015.
- Compared pre-incision bilateral SAP (n = 12) performed under general anesthesia to local anesthetic infiltration by surgeon at completion of surgery (LAI) (n = 19).
- Bupivacaine of varying concentrations (0.125 - 0.5%) and volumes was injected deep to the latissimus dorsi and superficial to the serratus muscle.
- All patients received postoperative patient controlled analgesia (PCA) with either morphine or hydromorphone.
- Measured post-operative narcotic consumption, Visual Analog Scale (VAS) pain scores over the first 24 hours, and time until conversion from intravenous to oral narcotic.

Results

<table>
<thead>
<tr>
<th>Group</th>
<th>Morphine mg/kg (Intraop)</th>
<th>Time to rescue dose (min)</th>
<th>Time to PO conversion (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAI</td>
<td>0.528</td>
<td>22.1</td>
<td>1.95</td>
</tr>
<tr>
<td>Bupivicaine 0.125% (n= 2)</td>
<td>0.587</td>
<td>46 (p&lt;0.05)</td>
<td>1.97</td>
</tr>
<tr>
<td>Bupivicaine 0.25% (n= 4)</td>
<td>0.556</td>
<td>38.75 (p&lt;0.05)</td>
<td>1.3 (p&lt;0.05)</td>
</tr>
<tr>
<td>Bupivicaine 0.5% (n= 2)</td>
<td>0.138 (p&lt;0.05)</td>
<td>21</td>
<td>1.65</td>
</tr>
</tbody>
</table>

Discussion

- SAP is a novel regional anesthetic technique in the pediatric population.
- No statistical difference was detected between the two groups overall.
- We observed a statistically significant decrease in intraoperative narcotic consumption with patients receiving SAP with 0.5% bupivacaine.
- Many confounding variables including providers of varying proficiencies performing a new block, different concentrations and volumes of local anesthetic, and the subjective nature of post-operative pain scores.
- Small sample size and varied injectate solutions were the main limitations of the study.
- We believe SAP is a viable option for post-operative pain control in patients undergoing VAPER.
- Further investigation with a larger group of patients and standardization of volume and concentration of local anesthetic is warranted to determine the effectiveness of this block.

References