Analgesic Benefit of PECS II Blockade for Open Subpectoral Biceps Tenodesis: A Randomized, Prospective, Double-Blinded, Control Trial

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Introduction

Interscalene nerve block (ISB):
- highly successful, relatively safe modality
- arthroscopic and open shoulder surgeries
- provides post-op analgesia
  
  Bishop et al. JBJS Am 2005

- lower pain scores and reduced need for opioids
  

- anaesthetises both upper and middle trunks of brachial plexus
  
  • Subscapular, axillary, suprascapular, lateral pectoral nerves
  
  Tran et al. Reg Anesth Pain Med 2017
Introduction

- Axillary pain common after open subpectoral biceps tenodesis

- ISB does not provide analgesic coverage for:
  - axilla or medial proximal arm
    - intercostal nerves, lower trunk
      - origin medial brachial cutaneous nerve and medial pectoral nerve
      - medial pectoral n. innervation: pec major and minor muscles
      - intercostobrachial nerve
Introduction

PECS blocks
– beneficial for radical breast surgery
– lymph node dissection


– PECS I- between pec major and minor
  • anesthetise medial and lateral pectoral nerves
– PECS II- adds a second injection between the pec minor and serratus anterior
  • anesthetise several intercostal nerves

Hypothesis:
Adding a PECS II nerve block to an ISB (+ PECS I) would reduce postoperative pain at 6h following block placement
Methods

Enrollment

Assessed for eligibility (n=47)

Excluded (n=7)
- Pre-existing neuropathy (n=3)
- Clavicular surgery planned (n=1)
- Severe pulmonary disease (n=1)
- Pre-operative steroid use (n=1)
- Severe burns over block area (n=1)

Randomized (n=40)

Allocation

Allocated to ISB only Group (n=20)
- Received allocated intervention (n=20)
- Did not receive allocated intervention (n=0)

Allocated to ISB + Pecs II Group (n=20)
- Received allocated intervention (n=20)
- Did not receive allocated intervention (n=0)

Follow-Up

Lost to follow-up (n=0)

Analysis

Analyzed (n=18)
- Excluded from analysis (no open biceps tenodesis performed) (n=2)

Analyzed (n=19)
- Excluded from analysis (no open biceps tenodesis performed) (n=1)
Methods

Statistics:
- Hedges Standardized Differences
- T test for 2 Independent Means
- Chi Squared Contingency Table
- Mann-Whitney U Test
VAS Pain Scores at Rest at 6 hrs
Axillary Pain at 6 hrs

Presence of Axillary Pain - Intention to Treat

% of Patients Reporting

70.6

15.8

p = 0.002651
significant at p<0.01
PACU Opioids

PACU Opioids - Intention to Treat

% of Patients Receiving

- 58.8
- 15.8

ISB Only
ISB plus PECS
## Results

### Table 2: Secondary Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>ISB Group (n=18)</th>
<th>ISB+PEC Group (n=19)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axillary pain at 6-h</td>
<td>N (%)</td>
<td>N (%)</td>
<td>&lt;0.001&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Required PACU opioids</td>
<td>12 (71)</td>
<td>3 (16)</td>
<td>0.008&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nausea/vomiting&lt;sup&gt;b&lt;/sup&gt;</td>
<td>7 (41.2)</td>
<td>7 (36.8)</td>
<td>0.789</td>
</tr>
<tr>
<td>PACU LOS (min)</td>
<td>92.6 (37.5)</td>
<td>115 (40.5)</td>
<td>0.061</td>
</tr>
<tr>
<td>24-hour rest pain (NRS)</td>
<td>5.61 (2.55)</td>
<td>5.42 (2.24)</td>
<td>0.811</td>
</tr>
<tr>
<td>PACU Fentanyl (mcg)</td>
<td>41.6 (65.1)</td>
<td>5.26 (15.3)</td>
<td>0.027</td>
</tr>
<tr>
<td>PACU Oxycodone equivalents (mg)</td>
<td>4.28 (4.01)</td>
<td>0.26 (1.12)</td>
<td>&lt;0.001&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cumulative opioids (mg)</td>
<td>31.6 (15.0)</td>
<td>26.9 (10.5)</td>
<td>0.279</td>
</tr>
<tr>
<td>Axillary pain onset (h)</td>
<td>16.7 (3.13)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Statistically significant outcome (Chi Square Table)

<sup>b</sup>At any point post-PACU discharge through 24-h post-block placement (Chi Square Table)

<sup>c</sup>Oxycodone equivalents (mg) from PACU discharge through 24-hours post-block.

For statistical evaluation, t-tests were used for all other continuous variables.

ISB, interscalene block; PEC, pectoral nerve block; PACU, post anesthesia care unit, LOS, length of stay, NRS, numeric rating scale (range 0-10)
Conclusion

The addition of PECS II block (PECS I + serratus plane) to an ISB with open subpec tenodesis:

– significantly improves postoperative analgesia
– reduction in resting NRS pain scores
– reduction in axillary pain at 6 hours
– reduction in need for opioids in PACU
Thank you