Effectiveness of Ultrasound-guided Single-injection Triple Nerve Block Before Cementless Bipolar Hip Hemiarthroplasty in Femoral Neck Fractures

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INTRODUCTION

- Elderly patients with femoral neck fracture present to the hospital in severe pain. In the elderly, uncontrolled pain results in worse outcomes.
- Continuous epidural injections have proven to be effective, despite reports of various respiratory and hemodynamic side effects.
- The preemptive use of analgesics in combination with intra-articular and periarticular injections is an opioid-sparing technique and shown to provide effective pain control for up to 4 days after BHA.
- The purpose of this study was to investigate the clinical benefits of ultrasound (US)-guided single-injection nerve blocks (SINB) performed on the femoral, obturator, and lateral femoral cutaneous nerves—peripheral nerves that innervate the proximal femur and hip joint—for patients undergoing BHA.

MATERIALS & METHODS

- We retrospectively compared clinical outcomes of 89 patients who underwent BHA between September 2016 and February 2018.
- Patients who received SINB before surgery (Group I; n=40), and patients who did not (Group II; n=41). 8 patients were excluded from analysis according to exclusion criteria.
- The femoral, obturator, and lateral femoral cutaneous (LFC) nerves were each blocked separately under US guidance. Pain scores by visual analog scale (VAS) were recorded 6, 12, 24, and 48 hours postoperatively, and all use of analgesics were recorded separately for 72 hours after surgery.
- Duration of hospitalization, general complications, and local complications due to SINB were also compared.

RESULTS

Table 1. VAS * for post-operative (mean, standard deviation)

<table>
<thead>
<tr>
<th>Time (hrs)</th>
<th>control (n=41) mean±SD</th>
<th>injection (n=40) mean±SD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours</td>
<td>2.15±(0.77)</td>
<td>3.85 (1.22)</td>
<td>0.000</td>
</tr>
<tr>
<td>12 hours</td>
<td>3.53 (0.82)</td>
<td>3.90 (0.86)</td>
<td>0.029</td>
</tr>
<tr>
<td>24 hours</td>
<td>3.48 (0.72)</td>
<td>3.39 (0.83)</td>
<td>0.715</td>
</tr>
<tr>
<td>48 hours</td>
<td>3.13 (0.56)</td>
<td>3.10 (0.58)</td>
<td>0.864</td>
</tr>
</tbody>
</table>

Table 2. PCA * Consumption for Post-operative 72hours (mean, standard deviation)

<table>
<thead>
<tr>
<th>Time (hrs)</th>
<th>control (n=41) mean±SD</th>
<th>injection (n=40) mean±SD</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours</td>
<td>69.68 (9.78)</td>
<td>86.90 (17.39)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

- There were no significant differences in age (Group I: 51.97, Group II: 59-99), gender, BMI, or Charlson Comorbidity Index (CCI).
- Group I patients’ subjective pain scores were significantly lower than those of Group II at 6 and 12 hours after BHA (p<0.05).
- PCA use in the first 72 hours was also significantly reduced in Group I.
- The amount of rescue analgesics given was significantly lower for Group I.

DISCUSSIONS

- In this study, SINB helped to achieve adequate pain control up to 12 hours after surgery. And results revealed that patients not only had fewer complaints of pain, but they also found postoperative breathing and rehabilitation exercises easier to perform.
- The authors believe that visual identification by US and subsequent deposition of local anesthetic under US-guidance allows for accurate blockage. The procedure employed in our study took less than ten minutes to perform and did not result in any complications.
- US-guided nerve blocks are safe, efficient, and useful considering pain control by PCA proved insufficient even when used in conjunction with preemptive analgesics.
- The primary limitation of this study is its retrospective design, which limits the ability to measure key statistics and control for potential biases. Also, limitation of this study is that VAS itself is not objective to measure pain.

CONCLUSIONS

- In this study, SINB helped to achieve adequate pain control for 12 hours after surgery. The results also showed reduced need for both opioids and for rescue analgesics.
- Ultrasound-guided lower limb nerve blocks provide excellent early postoperative pain relief and can be used as an accurate, safe, and effective method of pain control after BHA.