Perform MR, 0

Multiple studies have evaluated the efficacy of ultrasound guided peripheral nerve blocks for pain control both immediately post-operatively and in patient satisfaction of surgical pain control. In a prospective, randomized, controlled single-blind clinical trial testing specifically at forbotok surgeons, Samuel et al found that a combined ultrasound popliteal block with surgeon performed pre-operative ankle block had a significant reduction in the visual analog scale score at 24 hours after the procedure when compared to receiving the ankle block alone. The results of this study suggest that the ultrasound performed popliteal block may lead to reduced post-operative pain when ankle blocks may be more efficient in reducing time to the operating room: evaluated using the VAS scale.

Studies published by Grosser et al and Hansen et al both evaluated the pre-operative popliteal nerve block alone in elective foot and ankle surgery. Grosser et al found that popliteal nerve blocks were successful in 95% of the 48 patients they evaluated and additionally found that no delay in procedure start time occurred due to block placement. In a similar study performed by Hansen et al they evaluated the effectiveness of a popliteal nerve block as the sole anesthetic technique, 30% of the 25 patients successfully had a full block performed and, of these, the patients the local anesthesia coverage lasted 14 hours on average. Completeness of the popliteal block did not effect 24-hour post-operative pain.

Migues et al performed a study comparing popliteal blocks versus ankle blocks for local anesthesia in this prospective study they found that 92% of the ankle blocks were successful in anesthetizing the ankle, whereas only 35% of the ankle blocks taking a considerably shorter amount of time than the popliteal blocks (p<0.05) suggesting that popliteal blocks may shorten the time to operating room.

The surgeon performed peripheral nerve blocks consisted of a 1:1 mixture of 1% lidocaine and 0.5% Marcaine in an ankle block fashion anesthetizing the tibial nerve, saphenous nerve, superficial peroneal nerve, deep peroneal nerve, and sural nerve. The ultrasound-guided peripheral nerve blocks consisted of a 1:1 mixture of 1% lidocaine and 0.5% Marcaine in the ankle block anesthetizing the tibial nerve, saphenous nerve, superficial peroneal nerve, sural nerve, and cutaneous nerve. These ultrasound-guided blocks were either in an ankle block fashion described above or a popliteal block (see Figure 1 and 2) with additional inclusion of the saphenous nerve in the adductor canal.

The procedure for ankle blocks was performed with the patient in a supine position with a sterile drape around the foot. The ankle was palpated to find the tenderness to localize the tibial nerve and the ultrasound was placed over this point. The transducer was placed in the long axis towards the foot and a linear array 38 MHz probe was placed on the ankle. The needle was then inserted antegrade or retrograde, depending on the preference of the surgeon. Peri-operative pain was evaluated on the first and second post-operative visit.

Post-operative pain was evaluated at the first and second post-operative visit using the VAS scale to evaluate if any difference in post-operative pain was present between the traditional and ultrasound-guided groups. Data was analyzed by both model and paired t-test. Two differences were seen between the first and second post-operative visit, there should be no statistically significant difference in the perceived pain between the traditional and ultrasound-guided groups.

Methodology/Hypothesis
A retrospective case series of foot and ankle operative peripheral nerve blocks performed at an outpatient surgery center. These blocks were performed by either a resident or attending surgeons without ultrasound guidance or one of three anesthesiologists with ultrasound guidance. Inclusion criteria for the study included patients who had no prior foot surgery, intact neurovascular status, and undergoing elective foot and ankle procedures. Patients who had post-operative complications unrelated to anesthesia, use of chronic pain medications, tobacco use, or undergoing bilateral procedures, previous vascular surgeries, or who required intra-operative anesthetic supplementation were excluded from the study.

Literature Review

Post-operative pain was evaluated on the first and second post-operative visit using the VAS scale to evaluate if any difference in post-operative pain was present between the traditional and ultrasound-guided groups. Data was analyzed by both model and paired t-test. Two differences were seen between the first and second post-operative visit, there should be no statistically significant difference in the perceived pain between the traditional and ultrasound-guided groups.

Figure 1. Placement of transducer for popliteal nerve block

Table 1. Summary of results

Table 2. VAS of surgery performed peroperal nerve blocks up to 2nd post-operative visit

Results

Our results demonstrate that no significant difference in patient’s perception of pain at their first post-operative visit exists when comparing ultrasound guided peripheral nerve blocks and traditional nerve blocks at the first post-operative visit. No difference in technique is noted until the post-second post-operative visit when the ultrasound group is shown to have decreased perception of pain levels; however, there was no significant change in pain level when compared to the pre-operative VAS for the ultrasound guided blocks. A question asked during the post-operative visit related to the longer acting local anesthetic used by the anesthesia performing ultrasound guided blocks.

Conclusion

These findings are consistent with the literature performed by Migues et al in finding effective post-operative pain control with both popliteal and ankle blocks without ultrasound guidance. Our study differed from that performed by Samuel et al which had found significant reductions in post-operative pain with ultrasound guided blocks, in that our study did not combine popliteal and ankle blocks in any subjects. Limitation of this study is that our sample size is small, use of different equipment, and variability in post-operative pain control with both popliteal and ankle blocks without ultrasound guidance. In a prospective, randomized trial in 151 patients, J Foot Ankle Surg 2005; 44: 354-7.

Table 3. Summary of results

Comparison

Surgery Performed

Ultrasound Guided

Comparison P-value

Age in Years

51.5 ± 11.8

52.3 ± 16.9

0.839

Average VAS at 1st Post-op VAS

1.5 ± 4.2

2.0 ± 2.9

0.209

Average VAS at 2nd Post-op VAS

4.2 ± 2.4

2.3 ± 3.1

0.019

Average ΔVAS from Pre to 1st Post-op

1.4 ± 3.4

2.9 ± 3.6

0.167

Average ΔVAS from Pre to 2nd Post-op

1.3 ± 3.5

3.6 ± 3.6

0.068

References