In addition, radial inclination and ulnar variance were also improved in patients who received the volar locking plate compared with patients in the immobilized arm.

Complications in the volar locking plate arm included complex regional pain syndrome (CRPS), flexor tendon rupture, carpal tunnel syndrome, and requests to remove plates. In the immobilized arm, complications included malunion (1 of which was treated with corrective osteotomy), CRPS, and infection of K-wires.

In conclusion, Prof Koval stated that the results of this study suggest that the short-term outcomes associated with the use of a volar locking plate for the treatment of distal radius fractures were superior to those of other treatment modalities. However, a cost-savings analysis is needed to determine if earlier return to ADLs with volar locking plate treatment provides a cost savings over other modalities.

BPB Option in Operative Fixation of Distal Radius Fracture

Written by Emma Hitt Nichols, PhD

Preoperative pain control with brachial plexus blockade (BPB) reduced the need for other analgesics in the postanesthesia care unit (PACU); however, rebound pain caused greater pain scores postdischarge compared with patients who received general anesthesia (GA) during surgical fixation of distal radius fracture. Nirmal C. Tejwani, MD, New York University Langone Medical Center, New York, New York, USA, presented data from Brachial Plexus Block in Post-Op Pain Control After Distal Upper Extremity Fracture: A Prospective, Randomized Study [NCT01968824].

About 16% of all fractures treated by orthopaedic surgeons are of the distal radius, and the most common procedure used for their treatment is open reduction and internal fixation (ORIF). Currently, there are 2 methods of surgical anesthesia: GA and BPB; however, there are few studies that have evaluated their efficacy in surgeries that treat injuries distal to the elbow. Advantages of BPB are thought to include muscle relaxation and greater hemodynamic stability, as well as reduced PACU time, postoperative pain, and opioid use, decreased readmission for pain control, and increased patient satisfaction compared with GA. The purpose of this study was to evaluate the use of BPB in patients undergoing operative fixation of distal radius fracture.

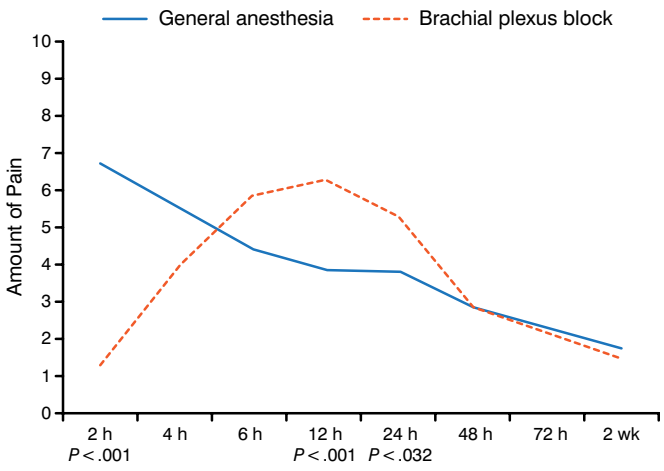
In this prospective trial, 36 patients with closed distal radius fractures requiring operative fixation were enrolled and were randomly assigned to receive GA or BPB preoperatively. Patients were excluded from the study if they had an open fracture or medical comorbidities, or if they refused. Oxycodone (5 mg) plus acetaminophen (325 mg) was administered to all patients on discharge. Follow-up occurred at 2, 4, 6, 12, 24, 48, and 72 hours postoperation to evaluate pain scores according to the visual analog scale and the number of pain tablets ingested.

The primary outcome of the study was pain scores. Secondary outcomes included time in the PACU, total pain medication required in the PACU, patient satisfaction, and functional outcome scores of the Disabilities of the Arm, Shoulder, and Hand (DASH) outcome measure and Short Musculoskeletal Function Assessment (SMFA).

At 2 hours, the BPB arm demonstrated significantly less pain compared with the GA arm ($P < .001$); however, at 12 and 24 hours, the BPB arm demonstrated significantly greater pain compared with the GA arm ($P < .001$ and $P = .032$, respectively), which then decreased to similar levels as the GA arm at 48 hours, 72 hours, and 2 weeks (Figure 1).

Patients who received BPB required significantly less time in the PACU compared with patients who received GA (197 minutes vs 284 minutes; $P = .026$). In addition, patients in the GA group required significantly more fentanyl ($P = .003$) and morphine compared with patients in the BPB group. However, there was no significant difference in functional outcome scores or oxycodone–acetaminophen consumption postdischarge. There was a trend of greater patient satisfaction in the GA arm compared with the BPB arm, although it was not significant ($P = .279$).

Figure 1. Pain Associated With Brachial Plexus Block During Distal Radius Fracture Fixation



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In conclusion, Dr Tejwani highlighted that although there are multiple benefits of BPB for postoperative pain control in patients undergoing fixation of distal radius fracture, rebound pain can occur. Therefore, use of GA may be beneficial in these patients. The orthopaedic surgeon should educate patients on the benefits of BPB and GA to determine the best pain management option.

Postoperative Antibiotics and Their Effect on Postoperative Infection After ORIF

Written by Emma Hitt Nichols, PhD

Surgical treatment of fractures is common, and therefore it is important to understand which approaches are most effective in reducing postoperative infections for these procedures. Brett D. Crist, MD, University of Missouri, Columbia, Missouri, USA, presented the results of a study of postoperative antibiotics for open reduction and internal fixation (ORIF) surgery for closed fractures [NCT00610987].

Although preoperative antibiotics are known to be effective in reducing infection, it is not clear whether postoperative antibiotics are also useful. Dr Crist noted that the Surgical Care Improvement Project increases the burden on hospitals and potentially on providers to use all possible means to reduce infections, increasing the importance of determining whether postoperative antibiotics are needed.

In this prospective, placebo-controlled, double-blinded study, adult patients receiving treatment for closed fractures (ORIF or prosthetic device placement) were randomized into 2 groups. All patients received 1 g of cefazolin intravenously prior to incision (2 g for patients weighing ≥80 kg) and then 1 g of cefazolin every 3 hours until completion of the surgery. The control group received 2 additional postoperative doses of 1 g of cefazolin administered at 8-hour intervals, whereas the treatment group received normal saline in identical packaging at the same postoperative intervals. Patients were followed up at 10 to 21 days, at 6 weeks, at 12 weeks, and at 6- to 8-week intervals until bony union occurred (for ORIF). Of the 229 patients initially randomized into treatment groups, 146 patients (75 in the antibiotic group and 71 in the placebo group) completed the full follow-up.

The primary outcome was presence or absence of infection, including superficial and deep infections. Deep infections were defined as those needing operative management. Descriptive statistics were calculated, and 6 risk factors were evaluated: smoking, age ≥65 years, diabetes mellitus, obesity, duration of surgery >3 hours, and urinary catheterization. These risk factors, which were chosen because they have been associated with infection in previously published studies, were ranked from 0 (lowest risk) to 7 (highest risk).

Table 1. Risk Factors for Infection Following Surgery

Risk Factor	Infected (n = 13)	Not Infected (n = 133)	*P* Value
Age >65 y	1	29	.3
Smoker	4	46	.5
Diabetes	4	12	.038
Body mass index >35	5	25	.14
Surgery >3 h	6	28	.049
Urinary catheter <48 h	2	19	.6
Urinary catheter >48 h	3	31	.15
Mean total risk factors	2.2	1.6	.15

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There was no significant difference in infection between the treatments, with 5.3% and 12.7% of patients developing infections in the antibiotic and placebo groups, respectively ($P = .12$). There was also no significant difference in deep infection ($P = .33$). Of the 6 risk factors examined, only diabetes (4.5 times greater risk of infection based on odds ratios) and duration of surgery >3 hours (3.2 times greater risk of infection based on odds ratios) showed statistical significance (Table 1).

Based on these results, Dr Crist concluded that postoperative antibiotics do not decrease the risk of infection. This is consistent with a previous meta-analysis by Slobogean and colleagues [*J Orthop Trauma*. 2008]. However, the current study differed from previous work in that it was placebo-controlled (unlike some others), focused on closed limb fractures, and used the preferred current cephalosporin antibiotic (cefazolin).

Dr Crist noted 2 limitations of the current study. First, the sample size was relatively small. Second, fracture types were combined. However, Dr Crist explained that combining fracture types increased the generalizability of the results and was consistent with other previous studies.

In conclusion, Dr Crist stated that postoperative antibiotics may not make a difference, based on this underpowered study, but continuation of antibiotics should be considered in patients with diabetes or if the surgery is going to last for >3 hours due to their significant increased risk of infection.