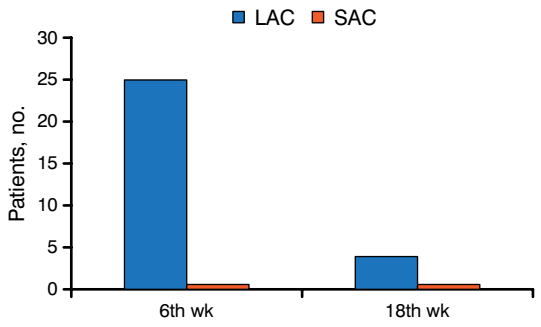
Figure 1. Effect of Casting Type on Elbow Extension



LAC, long arm cast; SAC, short arm cast.
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proximal palmar crease volarly. The cast was extended proximally to 1 inch distal to the antecubital fossa and posteriorly to the olecranon. In the long arm cast (LAC) group, the elbow was positioned in 90° of flexion and the cast was extended to the middle of the arm.

Patients assigned to the LAC group were converted to an SAC at 4 weeks, and all patients had their casts removed at 6 weeks. Reduction failure was defined as >5 mm displacement or >5° of angulations. Range of motion was considered abnormal if there was >10° difference with the unaffected wrist. Baseline, preoperative characteristics including radial inclination in the plain anteroposterior view, dorsal tilt angulations in the lateral view, and radial shortening in the plain anteroposterior view were similar among the SAC and LAC groups.

Patients in the SAC group demonstrated greater range of flexion and extension of the elbow at 6 and 18 weeks compared with the LAC group; however, the difference between the groups decreased substantially by the 18th week (Figure 1).

Similarly, patients treated with the SAC experienced greater range of supination and pronation of the forearm at 6 and 18 weeks compared with patients who received the LAC, with the difference between the 2 arms decreasing by week 18. The SAC arm demonstrated fewer blisters and wounds compared with the LAC arm. There was no significant difference in distal radio ulnar joint instability and reduction loss between the 2 arms. Patients reported greater satisfaction with the SAC compared with the LAC. There was no evidence of malunion, nonunion, carpal tunnel syndrome, and compartment syndrome in either group.

Prof Kachooei stated that the data from this study indicate that an SAC with proper 3-point and interosseous molding provides good therapeutic outcomes in patients with a type A2 fracture.

Improved Short-Term Outcomes With Volar Locking Plates, Immediate Mobilization in Wrist Fractures

Written by Emma Hitt Nichols, PhD

Use of volar locking plates and immediate mobilization for the treatment of distal radius fractures demonstrated greater improvement in functional, radiographic, and clinical scores compared with other treatment modalities, including casting and external fixation with 6 weeks of immobilization. Lidia Koval, MBBS, Mackay Base Hospital, West Mackay, Australia, presented data from a trial evaluating the use of a volar locking plate vs an external fixator or cast fixation in patients with a distal radius fracture.

Although the long-term outcomes associated with the treatment of distal radius fractures are similar across modalities, short-term outcomes are not well understood. Immediate immobilization of the wrists is important, yet it is inconvenient to the patient because it can cause loss of income and loss of independence. Therefore, regaining mobilization early is important. The purpose of this study was to evaluate the short-term outcomes of volar locking plates and immediate postoperative mobilization compared with conservative treatment with an external fixator and 6 weeks of immobilization in patients with a distal radius fracture.

In this prospective, single-center study, 50 patients with distal radius fracture who were recruited from 5 orthopaedic surgeons were randomly assigned to receive a volar locking plate with immediate mobilization postoperation, or casting or external fixator with or without Kirschner wires (K-wires) plus immobilization for 6 weeks postoperation. Functional outcomes were measured by the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the Patient-Rated Wrist Evaluation (PRWE) score. Clinical scores included range of motion, grip strength, and activities of daily living (ADLs), and radiologic outcomes were measured by radiography.

In the volar locking plate arm, the DASH score was lower ($P=.063$) and the PRWE was significantly lower ($P=.007$) compared with the immobilized arm. In addition, patients who received the volar locking plate demonstrated significantly greater grip strength compared with the immobilized arm ($P=.012$). Patients in the volar locking plate arm also demonstrated significantly improved ADLs compared with patients in the immobilized arm ($P=.036$). Radiologic evidence demonstrated that volar slope both after reduction and at follow-up was significantly better in the volar locking arm compared with the immobilized arm ($P=.01$ and $P=.001$).

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.

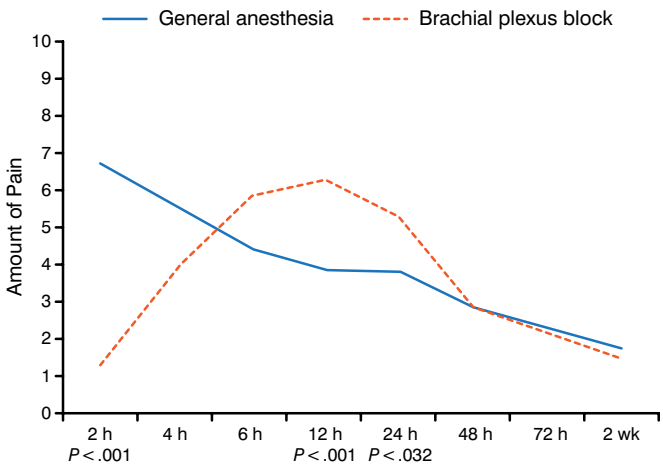
In this prospective trial, 36 patients with closed distal radius fractures requiring operative fixation were enrolled and were randomly assigned to receive GA or BPB preoperatively. Patients were excluded from the study if they had an open fracture or medical comorbidities, or if they refused. Oxycodone (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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