Is Postoperative Splinting Advantageous After Upper Extremity Surgery? Results from the Arm Splint Pain Improvement Research Experiment (ASPIRE)

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Purpose: The purpose of this study is to determine if application of a rigid elbow splint following surgery of the arm, elbow, or forearm results in superior outcomes than a soft dressing alone.

Methods: 100 consecutive patients who underwent surgical repair of a humeral shaft, distal humerus, olecranon, radial head, or isolated both-bone forearm fracture under brachial plexus nerve block and consented were randomly assigned to 1 of 2 groups: rigid splint (n = 51) or control (n = 49, soft dressing). Patients with elbow instability were excluded. Patients were surveyed daily for the first 5 days post-operation and once again at day 14. The primary outcomes were self-reported pain (visual analog scale [VAS] score), medication usage, and physical function (Short Form-36). Secondary outcomes included: wound complications and ultimate elbow range of motion. Outcomes were analyzed using standard statistical methods and compared.

Results: Patients in both cohorts reported the worst average pain and highest mean pain medication usage on day 2 following operation. At each time point, there was no difference in reported pain between the 2 study groups. Both study groups demonstrated similar rates of physical function and wound problems at all time points. Additionally, mean time to healing was similar for the splint and control groups (4.6 ± 2.8 vs 4.0 ± 2.2 months, $P = 0.37$). Ultimate elbow range of motion in elbow extension ($P = 0.61$), flexion ($P = 0.47$), pronation ($P = 0.61$), and supination ($P = 0.51$) were similar between the study groups.

Conclusion: Free range of elbow motion without splinting was non-inferior to elbow immobilization following surgical intervention for a fracture to the humerus, elbow, and forearm. There was no difference in patient-reported pain outcomes, wound problems, and elbow range of motion. Both treatment strategies are acceptable.