Pain Management After Carpal Tunnel Release Surgery: A Prospective Randomized Double-Blinded Trial Comparing Acetaminophen, Ibuprofen, and Oxycodone

Asif M. Ilyas, MD, Andrew J. Miller, MD, Jack G. Graham, BS, Jonas L. Matzon, MD

Purpose Adequate postoperative pain control in hand surgery is a multifactorial issue affecting patient satisfaction, outcomes, and safety. However, prescription opioid abuse is becoming an increasingly prevalent problem in the Unites States. The purpose of this study was to determine if there was a difference in pain levels or pill consumption when using nonopioids, ibuprofen (IBU) and acetaminophen (ACE), versus an opioid, oxycodone (OXY), after carpal tunnel release (CTR) performed exclusively under local anesthesia without sedation.

Methods Patients scheduled for primary unilateral CTR under local anesthesia alone were randomized to receive 10 deidentified opaque capsules of either OXY 5 mg, IBU 600 mg, or ACE 500 mg after surgery. Both the patient and the surgeon were blinded to the distributed medication. Patients reported the worst pain experienced daily (0−10 scale), the number of pills consumed daily, and any adverse effects from postoperative days 0−5.

Results Analgesic pill-type distribution between the 105 patients who completed the study was 37 OXY, 34 IBU, and 34 ACE. For the endoscopic CTR group, mean total pills consumed from the day of surgery through postoperative day 5 for OXY, IBU, and ACE were 2.9, 4.2, and 2.7, respectively. The average worst daily pain scores for all days for the OXY, IBU, and ACE groups were 2.8, 2.5, and 2.8, respectively. For the open CTR group, mean total pills consumed from the day of surgery through postoperative day 5 for OXY, IBU, and ACE were 3.7, 5.1, and 4.2, respectively. The average worst daily pain scores for all days for the OXY, IBU, and ACE groups were 3.4, 2.5, and 2.3, respectively. Four of 5 adverse events were reported by OXY group patients, but all were minor with no reoperations or readmissions.

Conclusions We recommend using nonopioids such as ACE and IBU in the postoperative management after CTR surgery, and regardless of the medication prescribed, we advise prescribing no more than 5−10 pills after surgery. *(J Hand Surg Am. 2018;43(10):913−919.*

Type of study/level of evidence Therapeutic II.

Key words Carpal tunnel, narcotics, opioids, oxycodone, pain management.

ASSH | Podium Presentation

Additional Material at jhandsurg.org

From the Rothman Institute, Thomas Jefferson University, Philadelphia, PA.

Received for publication May 14, 2018; accepted in revised form August 21, 2018.

This study was supported by a grant from the American Foundation for Surgery of the Hand.

Corresponding author: Asif M. Ilyas, MD, Rothman Institute, 925 Chestnut Street, Philadelphia, PA 19107; e-mail: asif.ilyas@rothmaninstitute.com.

0363-5023/18/4310-0004$36.00/0
https://doi.org/10.1016/j.jhsa.2018.08.011

Postoperative pain control in hand surgery is a multifactorial issue that affects patient satisfaction, outcomes, and safety.[1] Although adequate pain control affords improved patient satisfaction and potentially speeds up rehabilitation, there is growing evidence that patients are being overprescribed opioids with potentially negative consequences for both the individual patients and the community at large.[2–4] In fact, the Centers for Disease Control and Prevention estimate that nearly 15,000 people die each year in the United States from prescription painkillers including hydrocodone and oxycodone, resulting in what is being referred to as an opioid crisis.[5]

Related to hand and upper extremity surgery, we have previously found that patients are being inappropriately prescribed 3 times more than the number of opioids needed after upper extremity surgeries in general, and 5 times more than the number of opioids needed after carpal tunnel release (CTR) surgery specifically.[6,7] Moreover, excess prescribing of opioids has been demonstrated to result in diversion and abuse.[3,4] Brummet et al[8] recently reported that approximately 6% of preoperatively opioid-naïve patients continue to consume opioids 6 months after surgery, irrespective of whether the surgery was deemed major or minor, including hand surgery.

Similarly, Johnson et al[9] demonstrated that 13% of opioid-naïve patients continue to fill opioid prescriptions 90 days after hand surgery procedures.

Given the improved awareness of the risks associated with inappropriate opioid overprescribing, there is a general move to decrease the number of postoperative opioids prescribed and to increase the use of nonopioids whenever possible.[10,11] To evaluate the efficacy of using nonopioids in hand surgery, we undertook a prospective, double-blinded, randomized controlled trial evaluating opioid versus nonopioid pain medications after CTR surgery. Our study hypothesis was that there would be no difference in pain levels or pill consumption after surgery between opioids and nonopioids.

METHODS

After institutional review board approval was obtained, a prospective, randomized, controlled, double-blinded study was undertaken with 2 hand surgery fellowship-trained, board-certified orthopedic surgeons, who performed CTR surgery under local anesthesia without sedation. We adhered to the Consolidated Standards of Reporting Trials guidelines. During their preoperative office visit, patients were invited to participate if they were older than 18 years of age and were indicated to undergo an isolated, primary, unilateral CTR under local anesthesia. Exclusion criteria included bilateral procedures, additional soft tissue or bony procedures performed simultaneously, the use of sedation and/or general anesthesia, pregnant female patients, non–English speaking patients, known allergies or medical contraindications to oxycodone (OXY), ibuprofen (IBU), acetaminophen (ACE), lidocaine and/or epinephrine, and a history of chronic pain and/or current opioid use. After obtaining consent, the patient's demographic information and surgical details were entered into a secure, password-protected research database that was organized and maintained by the nonblinded research coordinator.

Postoperative study medications were prepared by a consulting pharmacy. Patients were randomized to receive one of the following 3 postoperative pain medications: OXY 5 mg, IBU 600 mg, or ACE 500 mg. All medications were formulated into opaque pill capsules and containers and labeled with serial numbers. Each container included 10 of the aforementioned pills, with instructions to take 1 pill every 6 hours as needed for pain. Both the patient and the surgeon were blinded to the medication type.

The allocations were maintained, randomized, and distributed by the nonblinded research coordinator, who provided them to the surgical facilities and the physician for dispersal to the patient on the day of surgery (DOS). Furthermore, the research coordinator maintained the drug accountability log for all medications that were secured and distributed to the patients. In addition to receiving the medications on the DOS, the patients were given a pain diary log to maintain and to return along with the pill container at the first postoperative visit.

All surgical procedures were performed by the 2 surgeons in an identical manner. The surgical site was infiltrated with a total of 15–20 mL of 1% lidocaine with epinephrine and 1–2 mL of bicarbonate. No preoperative antibiotics were given. After standard surgical preparation, either a mini-open or endoscopic CTR was performed. For the mini-open CTR, an incision was placed in the base of the palm in line with the third webspace. After dissection past the superficial palmar fascia and once satisfied the transverse carpal ligament (TCL) was clear of any traversing nerve branches, the ligament was released sharply until complete decompression of the median nerve was confirmed under direct visualization. The wound was washed and closed. A soft dressing was applied, which patients were advised to remove 2 days after surgery.

For the endoscopic CTR, a transverse incision was made proximal to the wrist flexion crease, lining up