

Editorial Commentary: Hip Preservation and Opioids



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Abstract: Approximately one-third of patients undergoing arthroscopic hip preservation surgery for femoroacetabular impingement syndrome and labral tears are on preoperative opioid medications. The single most important predictor for prolonged chronic postoperative opioid use is preoperative use. Despite the well-documented high success rates in nonarthritic, nondysplastic individuals undergoing hip arthroscopy, up to half of those individuals on preoperative opioids may still be on opioids at 1 to 2 years of follow-up. Mental wellness disorders (e.g., depression, anxiety, substance abuse) significantly impact both pre- and postoperative pain, function, and activity in nearly all joint and general health outcome measures. Multimodal pain management strategies have shown excellent reduction in perioperative opioid utilization. Intraoperative techniques should strive for comprehensive true hip preservation: labral repair, accurate cam/pincer morphology correction, and routine capsular management. Objective, quantitative pain threshold and pain tolerance measurements may improve treatment decision-making, with better prediction of surgical outcomes. Future personalized health care may use a single individual's mu opioid receptor (*OPRM-1* gene) and a number of other genetic markers for pain management to reduce the need for traditional opioid medications. Is opioid-free hip arthroscopy possible? Absolutely. Will the opioid epidemic end? Yes, but we have a lot of work to do.

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One of 5 patients with hip arthritis waiting for a total hip arthroplasty reports pain as “worse than death.”¹ Cam morphology associated with femoroacetabular impingement (FAI) syndrome is a common cause of hip arthritis.²⁻⁴ FAI syndrome is a common cause of hip pain in nonarthritic individuals.⁵ Unfortunately, the time and expense to make a diagnosis of FAI syndrome is extensive.⁶ During that time period, progressive degenerative changes may be occurring.⁷ The outcomes of arthroscopic hip preservation surgery are largely predicated on the presence or absence of any degree of arthritis.⁸ Hip arthroscopy for FAI syndrome and labral pathology is highly successful in not only treating pain and improving function, but also reducing the risk of eventual hip arthritis and subsequent arthroplasty.^{9,10} After hip arthroscopy, pain management may involve opioid medications, frequently as part of a multimodal program.

Regrettably, the United States is in the midst of a tragic opioid epidemic. Thus, the exponential international increase in the incidence of hip arthroscopy mandates a strategy to reduce or eliminate opioids as part of perioperative care. That is why the study by Beck, Nwachukwu, Jan, Krivicich, Chahla, Fu, and Nho, “The Effect of Postoperative Opioid Prescription Refills on Achieving Meaningful Clinical Outcomes After Hip Arthroscopy for Femoroacetabular Impingement Syndrome,” is so critically important.¹¹

Opioid utilization both before and after hip arthroscopy is not uncommon (Table 1). In the analyzed investigation by Beck et al., the authors used a very practical retrospective case-control design comparing post-hip arthroscopy patients with ≥ 1 opioid refill and patients not obtaining a refill.¹¹ After surgery, the standard protocol was 30 pills of 5 mg/325 mg hydrocodone/acetaminophen to be used every 4 to 6 hours. Refills were given on a case-by-case basis, at the patient's request. Only 14.5% of the 883 eligible patients had ≥ 1 refills. Within the refill group, 73% had only 1 refill, 20% had 2 refills, and 7% had ≥ 3 .

Because of the method of electronic medical record analysis, it could not be determined what percentage of patients were on preoperative opioids. In general, approximately one-third of patients undergoing hip arthroscopy are on preoperative opioids (Table 1; 22%

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Table 1. Selected Publications Analyzing Perioperative Opioid Use in Patients With FAI Syndrome Undergoing Hip Arthroscopy

Publication	Year	Subjects	Preoperative Opioid Use	Postoperative Opioid Use
Jacobs et al. ¹⁴	2020	14,830 patients, Truven Marketscan database	<ul style="list-style-type: none"> • 29.3% used within 6 months preop • 35% had depression or anxiety 	<ul style="list-style-type: none"> • 25.5% were still on opioids >3 mo postop
Westermann et al. ¹³	2019	1,208 patients, PearlDiver database (Humana)	<ul style="list-style-type: none"> • 25% chronic use (1 to 3 mo preop) • 17% acute use (<1 mo preop) 	<ul style="list-style-type: none"> • 17% and 15% were still on opioids at 3 and 12 mo postop • Chronic preop use was strongest predictor of postop use (1 y); 50% still on 3 mo (vs 5% no preop use); 43% vs 5% at 12 mo
Rhon et al. ²⁷	2019	1,870 patients, Military Data Repository	<ul style="list-style-type: none"> • 49% used preop 	<ul style="list-style-type: none"> • 39% had ≥3 opioid prescriptions postop • 44 ± 37 mean total d opioid use postop
Anciano Granadillo et al. ¹⁵	2018	1,708 patients, PearlDiver database (Humana)	<ul style="list-style-type: none"> • 28% used 1 to 4 mo preop 	<ul style="list-style-type: none"> • 27% used 3 to 6 mo postop • Preop use was most significant risk factor for prolonged postop use • Use >3 mo significantly associated with increased revision, THA risk
Westermann et al. ²⁸	2018	321 patients, single surgeon	<ul style="list-style-type: none"> • 17% used <3 mo preop • 28% used >3 mo preop • Preop use associated with worse measures of joint and general health and function 	<ul style="list-style-type: none"> • Not applicable
Cunningham et al. ²⁹	2018	73 patients, 2 surgeons	<ul style="list-style-type: none"> • 22% used <2 wk preop 	<ul style="list-style-type: none"> • 6 weeks postop, 79% of subjects not on preop opioids took <30 oxycodone pills vs only 13% with preop use

FAI, femoroacetabular impingement; postop, postoperative; preop, preoperative; THA, total hip arthroplasty.

to 49%). Based on similar demographics (age, sex, activity level, function, duration of symptoms) in Beck et al. to the studies currently available in the literature, a similar proportion of subjects would be expected to be on opioids before surgery. Because nearly all patients undergoing hip arthroscopy have a preoperative expectation for postoperative pain relief, one can conclude that ultimate cessation of opioids after surgery should occur.¹² Thus, because the biggest risk factor for postoperative opioid use is preoperative use, surgeons must determine, before surgery, several things regarding a patient's opioid utilization: which ones, what doses, for what duration, daily oral morphine milligram equivalents (MME; if ≥50 MME per day, then the risk of overdose death is double that of ≤20 MME per day; further, if ≥50 MME per day, a naloxone prescription should be provided), how many doctors are providing opioid prescriptions (available via state-wide prescription monitoring programs), any illegal opioid or other drug use (heroin, alcohol, cocaine, other

Schedule I substances), any illegal acquisition and use of opioids obtained outside of the United States (e.g. Mexico, Canada, internet), history of opioid use disorder (or tolerance, withdrawal), history of suicide attempt, history of Narcan (naloxone) use or prescription, and history of depression or anxiety.

Depression and anxiety have been associated as significant risk factors for both preoperative^{13,14} and postoperative¹³⁻¹⁵ opioid use. Because depression and anxiety frequently coexist with hip pain before arthroscopic hip preservation surgery (present in up to one-third of patients; also significantly influences postoperative outcomes),¹⁶⁻¹⁸ concomitant management of mental health disorders, in addition to the hip problem itself, is an incontrovertible necessity. Surgeons must be able to recognize, inquire, characterize, diagnose, and refer or treat all mental wellness disorders before undertaking hip arthroscopy. Although patients with mental wellness disorders do improve after hip preservation surgery, they do not improve as

much (or achieve an absolute value of outcome) as those without mental wellness disorders.^{16,17}

After surgery, patients may obtain opioids from a variety of sources: treating surgeon, primary care physician, emergency department, other specialist physicians, family member or friend, internet, other state/country, illegal means, or simply any health care system outside of the treating surgeon's system. The latter is an incongruous reality in today's electronic health care world: the ability to interconnect systems, hospitals, doctors, and patients may be worlds apart, despite being across the street.

In Beck et al., detection bias exists in the use of a single electronic medical record, one that has the "option" to interconnect to other institutions using the same electronic record. This record, though, lacks an efficient search mechanism, almost prohibitively, to reliably evaluate for perioperative opioid use. The electronic medical record analysis evaluates only for prescription dispensation, not actual pill consumption. Thus, some patients may have received an initial postoperative prescription for 30 pills, but not consumed them all. Similarly, some patients may have received a refill of opioids, but not consumed them all (or part, or any).

Patients undergoing hip arthroscopy for FAI syndrome frequently have low back pain.¹⁹ Although the exact prevalence of hip-spine syndrome is incompletely understood,²⁰ it is well known that the characteristics of back pain may impact hip surgery outcomes.²¹ In addition, and relevant to Beck et al., is the fact that pain in the back (and other body parts) may also prompt opioid use. Thus, post-hip surgery opioid use may occur and get attributed to the hip, but in reality be for a separate issue. Similarly, because of the study design, it is possible that patients with a successful unilateral hip arthroscopy outcome underwent staged bilateral procedures, with subsequent contralateral hip arthroscopy (and subsequent opioid prescription) counting as prolonged, chronic, persistent, or long-term opioid use, confounding the study's conclusions.

The patient population examined in Beck et al., was largely from the United States. One needs to simply read a unique paper comparing patient geography (United States vs Netherlands) in those undergoing surgical treatment of hip fractures and ankle fractures.²² After surgery for hip fractures, 77% of American patients and none of the Dutch patients were prescribed postoperative opioids. After surgery for ankle fractures, 82% of American patients and 6% of Dutch patients were prescribed postoperative opioids. The Dutch patients were prescribed acetaminophen and ibuprofen only. No short-term complications or pain management differences between countries were observed. Thus, international extrapolation of the

opioid utilization findings of Beck et al. is to be done with caution.

To avoid long-term opioid use, in opioid-naive and non-opioid-naive subjects undergoing hip arthroscopy, surgeons must do everything right in surgery (preserve the labrum, comprehensively correct cam/pincer/sub-spine morphologies, manage the capsule) and in the office (before and after surgery). Opioid reduction/elimination programs are being advocated by the American Academy of Orthopedic Surgeons (AAOS), the Arthroscopy Association of North America (AANA), and several other specialty societies. Multimodal programs include preoperative pre-emptive nonopioids (e.g., acetaminophen, celecoxib, GABA analogs [gabapentin, pregabalin], anti-nausea medications [ondansetron, promethazine]), intraoperative opioid reduction/elimination (e.g., fentanyl, hydromorphone, morphine; periarticular local anesthetic infiltration; air arthrogram-assisted traction; postless distraction), postoperative nonopioid medication optimization (e.g., acetaminophen, GABA analogs, celecoxib for heterotopic ossification, aspirin for thromboembolic disease prophylaxis, antifibrotic treatments [losartan, fisetin]), early physical therapy with gentle passive motion, including continuous passive motion machines, and early cryotherapy/compression.

A systematic review and network meta-analysis of 14 level I evidence studies suggested that adjunct anesthesia (local anesthesia infiltration) significantly reduces postoperative pain and opioid consumption.²³ Although perioperative regional blockade may reduce pain after hip arthroscopy, there is a significant increase in fall risk.²⁴ Although not previously discretely analyzed and reported, patient education is likely a critical component of postoperative pain and expectation management. Similarly, pain tolerance is an issue that has received minimal attention in the orthopaedic literature despite its logical significant impact.²⁵ Future investigations need to objectively, quantitatively measure pain threshold and pain tolerance (e.g., dozens of test variations on the ice bath, heating pads, pressure, electrical stimulation).²⁶ Also, given the rapid recent growth in patient-specific customized health care, genetic analysis of the mu opioid receptor, encoded by the *OPRM-1* gene, may permit personalized nonopioid medical treatments to optimize pain management without the inherent risks of traditional opioids.

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