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Randomized Control Trial Evaluating Postoperative Opioid Demands Following Hip Arthroscopy

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Introduction

Opioid use and abuse has become a national crisis in the United States[19] and it is now recognized as an important healthcare issue (with a 200 percent increase in overdose deaths from opioid and heroin use between 2000 and 2014).[16] The Centers for Disease Control and Prevention (CDC) estimated that over 60,000 drug overdose deaths occurred in 2016, with overdose death rates three times the rate of 1999.[7] Up to 70% of opioid abusers become addicted through an initial course of legal, physician-prescribed medications. Consequently, there has been increased pressure on medical care providers to be better stewards of these medications.[19]

Opioid prescription recommendations uniformly suggest using the lowest effective dose, for the shortest possible duration. However, limited data exists in the literature defining what is the "lowest dose" and "shortest possible duration" for orthopaedic sports medicine, with no randomized controlled trial data establishing these minimally effective doses for specific procedures. Prior investigation in the context of other procedures report that patients often use <50% of their opioid pain medications and >90% save these medications.[32] In general surgery, research has shown that there is wide variability in opioid prescribing practices and that providing a guideline for postoperative opioid prescribing has reduced initial opioid prescription size with

no change in patient satisfaction, pain control, or subsequent refill requests.[2, 5, 8-11, 14, 17] Furthermore, patients also report using fewer opioids when initially prescribed fewer pills. [2, 10] With the prominence of illicit opioid use and epidemic of opioid-related deaths from overdose, minimizing dispensation of these medications continues to be a concern, particularly in the field of orthopaedics.

Although opioid use guidelines currently exist in the orthopaedic literature, there is significant variability in recommendations, and few if any, are supported by level I evidence. Recent literature from Overton et al provided recommendations for postoperative morphine equivalents, including those for several orthopaedic procedures, including partial meniscectomy (0-10 5mg oxycodone, 0-75morphine equivalent), ACL reconstruction and rotator cuff repair (0-20 5mg oxycodone, 0-150 morphine equivalents).[15] Of important note, patients undergoing each respective procedure consistently preferred lower opioid doses than surgeons performing the surgery.[15] Such recommendations have not been established for patients undergoing hip arthroscopy for femoral acetabular impinge (FAI) and labral pathology. Prior literature investigating this specific patient population has identified several risk factors for increased postoperative opioid demands, particularly preoperative opioid use, obesity, back pain, substance abuse, and concurrent mental health diagnoses such as anxiety and depression.[1, 4, 20, 21] Subsequent research has demonstrated that these prescriptions following hip arthroscopy can be reduced (mean 16.3 pills) through interventions such as mandated physician education.[18] However, it is not known if additional investigations, including randomized controlled trials, could demonstrate the possibility of even further reduction of postoperative opioid dispensation.

From a patient, physician, and public health perspective, there is both a need and common goal to reduce the unnecessary prescribing of opioid medications following common orthopaedic procedures, including hip arthroscopy for the treatment of femoral acetabular impingement and labral pathology. The feasibility of randomized controlled trials to investigate this issue has been recently demonstrated in the arthroplasty literature.[6] Therefore, the purpose of this study is to perform a randomized controlled trial to assess postoperative opioid consumption and patient reported pain scores following hip arthroscopy for FAI and/or labral pathology.

Purpose/Study Rationale

The purpose of this prospective randomized controlled trial is to determine if the quantity of opioid pills prescribed at discharge is associated with the number of opioid pills consumed or unused by patients after primary hip arthroscopy.

Hypothesis

It is hypothesized that patients receiving a prescription for 5 opioid pills (Norco) at discharge will consume significantly fewer Norco pills and report significantly fewer unused Norco pills in the first 30 days postoperatively than patients who receive 30 pills. Additionally, we hypothesize there will be no difference in patient reported functional outcome scores.

Study Plan

This study will be a prospective single blinded randomized controlled trial (RCT), investigating the influence of the number of opioid pills prescribed following primary hip arthroscopy. All patients who sign the consent form will be enrolled in the study and randomized to one of the two treatment arms. The intervention group will receive 5 Norco pills, gabapentin (30 mg, once daily for 10 days following surgery), and Tylenol (1000 mg, three times daily for 10 days following surgery) while the control will receive the standard at our practice of 30 Norco pills.

Standard of care follow-up will take place at 1, 3, 6, and 12 months postoperatively. Variables of interest will include postoperative patient pain scores (I.e. VAS), total morphine equivalents taken in the first 30 days after discharge, number of unused opioid pills, and opioid disposal rates. Standard patient reported outcomes measures (PROMs), including hip disability and osteoarthritis outcome score (HOOS), Harris Hip score (HHS), visual analog scale (VAS) for pain, international hip outcome tool (iHOT-12), and Hip outcome score (HOS), will be collected at 3, 6, and 12 months postoperatively.

Statistical Assumptions

Power analysis was approximately based on previously published data regarding quantity and duration of opioid use following hip arthroscopy and other sports medicine procedures. One prospective study by Cunningham et al reported a median opioid consumption in terms of number of 5-mg oxycodone pills consumed in the 6-week postoperative period. This value was 20 pills for opioid naïve patients with an interquartile range of 1 – 38 pills.[4] There were no reported standard deviations. Based on opioid consumption following other sports medicine

procedures (i.e. ACL reconstruction), variability (SD) has been observed to be ± 50% of the mean.[12, 13] To detect a 25% reduction in opioid consumption, with 80% power, and an alpha of 0.05, a sample size of 126 (63 patients per group) is required. Accounting for 20% attrition and 15% cross-over from the experimental to the control group, a total sample of 170 patients (85 per group) will be enrolled in the study.

Enrollment Process

Potential participants are identified by the research study staff, enrolling investigator and/or PI via medical chart and case review. The study eligibility requirements are reviewed participant is pre-selected as tentatively meeting the eligibility requirements for the study. An e-consent process will be used to obtain patient agreement through Patient IQ.

Informed Consent Discussion

Investigator and/or PI and research study staff will contact the patient in clinic or via telephone to discuss the research study with them. Ideally, the informed consent discussion should be conducted when the study staff and potential participant has time to ask and answer questions. Information provided to the patient includes the rationale for the study procedure or treatment, the number of study visits and the study activities they will need to complete, risks involved, expected benefits, and alternatives to treatment including the likely results of no treatment and that their participation is voluntary and can be stopped at any time.

The process may occur over a period of several discussions, culminating in the signing of a consent form online. Informed consent discussion will be documented in the patient profile or chart.

Patient randomization will occur prior to consenting process.

Documentation of Informed Consent Discussion and Sending of Econsent

A Note to File/Telephone log will be created to document the Informed Consent Discussion containing the following:

I called and discussed/connected on the phone with patient {and *** Person (s) with patient; or called the Legally Authorized Representative (LAR)} to discuss the consent for {name of protocol}. I verified the identity of the individuals involved in the discussion by verifying full Name (required) AND

___ Date of birth and___ Last four digits of SSN

The protocol was explained in detail, including all the contents of the informed consent document and HIPAA authorization. The Rush IRB Guidance for the Use of Electronic Informed Consent 6 Version 2_8.13.2020 discussion included, but was not limited to, risks & benefits, medications/treatments used, randomization process, procedures, confidentiality of research records, time commitments involved, voluntary participation in the study and the option to withdraw at any time, and cost. The patient is aware the study involves research and is knowledgeable regarding alternative treatments to study participation. The patient was given reasonable time to consider participation in the study, in the absence of coercion or undue influence. The patient was offered an opportunity for questions and these questions were answered to the satisfaction of the patient. The patient verbalized understanding of the information presented.

The NTF will contain the following:

Name of Person Conducting Informed Consent Discussion

Date/Time when IC discussion took place

Signature of Person Conducting Informed Consent Discussion

Date/Time when IC was signed

If the patient agrees to participate, their email addressed was verified. No research activities were performed prior to execution of the consent. The patient is aware {he/she} appears to be eligible for the study based on current available information but signing the consent form does not guarantee participation in the study. Further screening will be scheduled to ensure that eligibility requirements are met. Participation in the study is dependent on meeting all inclusion/exclusion requirements. At the time of enrollment, the eligibility form will be completed, signed and dated by study team and enrolling investigator/PI to be reviewed by PI.

The potential participant will be sent a valid Rush IRB approved stamped copy of the informed consent form for the study through an electronically secure and approved electronic platform (Patient IQ) through their email. The potential subject will then be prompted to reply with the appropriate passcode in order to access the consent form, and then provide the passcode again with their signature (secured).

A copy of the timestamped document will be sent to the study team through the electronic platform and a copy will be sent to the participant. The process of consent will be documented on the Informed Consent Process Note.

Inclusion Criteria

- Adult patients age 18-80 years

- English speaking

- Opioid naive patient (defined as not taking opioid pills within 6 weeks prior to surgery), confirmed by checking the Illinois Prescription monitoring program

- Primary hip arthroscopy

- Written and informed consent for study participation

Exclusion Criteria

- Minors (< 18 years of age)

- Opioid tolerant patients

- Revision surgery

- Prior infections of the operative joint
- History of active malignancy within the past 5 years
- Chronic pain conditions including low back pain, chronic pain syndrome, fibromyalgia
- History of alcohol or other substance use disorder
- Rheumatologic conditions, diabetes mellitus, hypo/hyperthyroidism, depression, anxiety, and other disease states at the discretion of the principal investigator
- Exclude grade IV chondral defects

Study Procedures

For the purpose of this study, the investigators propose two standardized prescribing patterns across all teams. The first would be the control postoperative prescribing pattern and the second would be the experimental opioid reduced prescribing pattern. Patients will not be informed if their postoperative prescriptions are part of the control or opioid reduced prescribing pattern. These are detailed below. Of note, patients will be allowed to cross over from the opioid reduced experimental group to the standard of care control group if they have breakthrough pain following surgery. The following non-opioid medications are standard of care at our practice following hip arthroscopy and, thus, will be prescribed to patients regardless of the group they are randomized to: aspirin (325 mg, two times daily for 30 days) and Indocin (75 mg extended release, one time daily for 10 days).

<u>Group 1 (control – standard of care prescribing procedure)</u>:

- Norco (hydrocodone-acetaminophen) 5mg-325mg, 30 total pills

Group 2 (experimental – opioid reduced):

- Tylenol extra strength (1000 mg, three times daily for 10 days following surgery)
- Gabapentin (300 mg at night for 10 days following surgery)
- Norco (hydrocodone-acetaminophen) 5mg-325mg, 5 total pills

Timeline of Events

1. Following informed consent during the office visit when surgery is scheduled, all patients will be randomized to one of the postoperative pain management protocols, either the control or opioid reduced.
2. Subjects will proceed with hip arthroscopy, including appropriate treatment and documentation of concomitant injuries.
3. Over the course of the 1st month postoperatively, patients will complete a 30-day diary detailing which medications they took on each day and their daily average pain level (indicating whether physical therapy was performed). Data pertaining to prescription refills (i.e. number of refills, time to refill), number of left-over pain medications, and disposal rates of opioid medications will also be recorded at these time points as well.
4. Patients will return for standard of care postoperative visits at 1, 3, 6, and 12 months postoperatively. Patients will be asked to complete PROM questionnaires at the 3, 6, and 12 month follow-up time points.

	Day Surgery is Scheduled in Clinic	Preop	Surgery	1 month	3 months	6 months	12 months
Patient Recruitment/ Informed Consent/Randomization	●						
30-day Medication and Pain Diary			●				
Opioid Refill and Disposal Data				●	●	●	●
PROMs		●			●	●	●

Table 1. Study timeline

Primary and Secondary Outcomes

Primary Outcomes:

- The primary outcomes of this study are the number of Norco pills used and the number of Norco prescription refills.

Secondary Outcomes:

- The secondary outcomes of this study include standard PROMs, including hip disability and osteoarthritis outcome score (HOOS), Harris Hip score (HHS), visual analog scale (VAS) for pain, and international hip outcome tool (iHOT-12) at 3, 6 and 12 months postoperatively.

Benefits of Participation

There is no direct benefit to the patient for his/her participation in this study. The results will contribute to the improvement of postoperative opioid prescribing patterns, specifically limiting

unnecessary dispensation of opioid medications. This study will discern if and by how much opioid medications can be reduced postoperatively following hip arthroscopy.

Alternatives to Participation

The alternative to participation in this study is not to participate. Patients who decline to participate will be offered to proceed with the consented hip arthroscopic surgery. Postoperative pain management medications will be provider dependent and in accordance with their standard of care.

Risk/Benefits

Breach of confidentiality and/or privacy is a risk of the study. Below is a description of the procedure for maintaining confidentiality. There is no direct benefit to the participants in this study.

Procedures for Maintaining Confidentiality

A breach of confidentiality and/or privacy is a risk of this study. To prevent this and protect patient identity and information, all collected data will be deidentified and stored electronically in password-protected files. All information will be collected and reviewed by the research team only. Data will be maintained on a password-protected computer in the research office of MOR.

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