

Post-Operative Pain Management for Opioid Dependent Patients Following Orthopedic Surgery

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INTRODUCTION

Substance abuse has spread throughout the country, widely affecting millions of Americans per year. There are approximately 8 million Americans dependent on alcohol and approximately another 3 million dependent on illicit drugs (Kosten, 2003). Substance abuse includes all forms of dependency including alcohol, prescription opioids, and illicit drugs. With millions of Americans affected, it can be common to encounter many patients who are presenting for surgery with an opioid dependency or some tolerance to the analgesic effects of opioids (Mitra, 2004). This can present a challenge for many anesthesiologists, as chemically dependent patients have hemodynamic changes based on the duration and history of their addiction. One of the most challenging aspects for anesthesiologists, particularly in chemically dependent patients, is management of post-operative pain. Obtaining an accurate and detailed history and physical on these patients will be a crucial step to determine the appropriate anesthetic technique, which will best attenuate predicted postoperative pain (White, 2001).

Opioids are the gold standard drug for analgesia during the perioperative period due to their rapid onset and efficacy. For patients with existing chemical dependency disorder, opioid use alone may not suffice to attenuate their pain, and may exacerbate their dependency disorder. Poorly managed perioperative pain control in chemically dependent patients can lead to further hemodynamic compromise and poor patient outcomes (Carroll, 2004). Evidence suggests that a multimodal approach to pain management can significantly reduce the requirements of opioids in post-operative pain control. Longer acting, nonopioid medications used as adjuvant drug therapies along with regional or neuraxial anesthesia can be beneficial to patients with higher tolerance to opioids (Mitra, 2004). Regional and neuraxial anesthesia should be considered for every case as it can provide better post-operative pain control with lower opioid requirements thus promoting better patient outcomes (Ward, 2018).

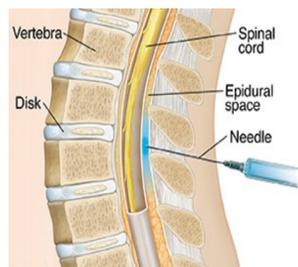


Figure 1. Neuraxial Anesthesia Block Anatomy

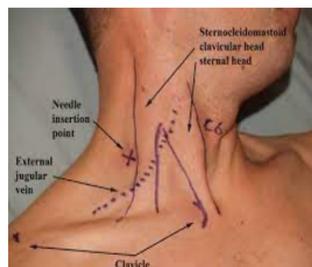


Figure 2. Regional Anesthesia: Interscalene Block Anatomy

REVIEW OF LITERATURE

This article is an examination of common complications that would arise when treating and managing postoperative pain in an opioid dependent patient following orthopedic surgery. Patients with reported chronic opioid dependency tend to have slower resolution of pain and increased intensity of acute pain. A thorough history and physical should be performed in the preoperative setting, in order to determine the patient's current degree of opioid use. Another useful tool to help evaluate these patients and correctly categorize their dependency status, would be calculating their morphine equivalent amount (MEA). Many patients with opioid dependency tend to have psychiatric comorbidities or difficulty in commitment to opioid independence, requiring referral to the appropriate provider. The preferred method of pain management would be a multimodal approach with preemptive analgesia in the preoperative period. Regional and neuraxial anesthesia have been increasingly popular due to decreased opioid requirements, patient's reporting improved pain control, and decreased incidence of thrombotic events. In the Cochran database review, patients who underwent total knee arthroplasty or total hip arthroplasty received an epidural analgesia and reported lower incidence of sedation along with lower visual analog scores (VAS). NSAIDs, which were previously avoided by orthopedic surgeons, have since returned with evidence showing delayed bone healing is dose/duration dependent. Ketamine and acetaminophen are also gaining increasing popularity as adjunctive pain control medications in opioid dependent patients.

Low (0-30 mg/d)	Moderate (30-60 mg/d)	High (>60 mg/d)
Preoperative Visit Set goal of gradually eliminating opioid intake prior to surgical date	Preoperative Visit Set goal of decreasing opioid intake to mutually agreed on amount prior to surgical date	Preoperative Visit Educate patient regarding implications of high opioid intake
Provide non-opioid alternatives as appropriate	Discuss pain-related beliefs and provide non-opioid alternatives as appropriate	Offer and recommend addiction specialist consultation
Clearly delineate amount of postoperative opioid prescriptions to be dispensed	Clearly delineate amount of postoperative opioid prescriptions to be dispensed	Determine need for additional measures (eg, detoxification, counseling) as guided by addiction specialist consultation
Reinforce weaning of opioids during additional preoperative visits	Reinforce target opioid intake goal	
Surgery Consider regional anesthesia as appropriate	Surgery Consider regional anesthesia as appropriate	Surgery Consider regional anesthesia as appropriate
Judicious opioid administration in perioperative period	Consider additional multimodal measures with anesthesia provider (preemptive analgesia, NSAIDs/ ketorolac, acetaminophen, anticonvulsants, ketamine)	Implement additional multimodal measures with anesthesia provider (preemptive analgesia, NSAIDs/ ketorolac, acetaminophen, anticonvulsants, ketamine)
Postoperative Visits Assess opioid intake at each postoperative visit	Postoperative Visits Assess opioid intake at each postoperative visit	Postoperative Visits Assess opioid intake at each postoperative visit
Encourage and facilitate opioid independence	Encourage and facilitate opioid independence	Ensure continued follow-up with addiction specialist
		Agree on single provider to dispense additional opioid prescriptions
		Encourage and facilitate opioid independence

* Assessment and management that includes a patient history and physical examination, followed by opioid use quantification (daily morphine equivalent)

Graph 1. Recommendations for managing postoperative pain depending on the patient's degree of opioid use.

CASE STUDY

A 52-year-old male presents with myelopathy and multi-level cervical stenosis. His preoperative history and physical is significant for chronic opioid use for several years with the past 3 months consisting of 90mg of oxycodone and 30mg of oxycodone a day for pain. He has an associated diagnosis of depression, which is not currently being treated. Patient was referred to psychiatrist prior to surgery. Preoperatively, he received 300mg of pregabalin, 30mg of oxycodone, and intravenous acetaminophen. Following surgery, patient was transferred to the ICU with a ketamine infusion, opioid dose matching his MEA in preop, intravenous acetaminophen, and pregabalin. Patient was discharged home following an uneventful stay with long-acting opioids and short acting opioids. He was instructed to continue follow up appointments until 12 weeks post surgery to ensure opioid independence.

Throughout the 12 weeks post surgery, patient was failing his opioid independence regimen and was referred to an inpatient addiction unit. He was successfully weaned off his opioids and achieved opioid independence. 18 months post surgery, patient is now opioid independent and only uses acetaminophen occasionally for pain as needed.

Opioid	Ratio* (mg morphine/mg opioid)
Fentanyl patch	30/12.5
Fentanyl lollipop	3/100
Hydrocodone (oral)	30/30
Hydromorphone (oral)	30/7.5
Meperidine (oral)	30/300
Methadone (oral)	30/20
Morphine (oral)	30/30
Nalbuphine (oral)	30/10
Oxycodone (oral)	30/20
Oxycodone (IV)	30/10
Propoxyphene (oral)	10/13
Tapentadol (oral)	30/100
Tramadol (oral)	1/10
Fentanyl (IV)	75/1
Hydrocodone (IV)	30/20
Hydromorphone (IV)	30/1.5
Meperidine (IV)	30/300
Methadone (IV)	30/20
Morphine (IV)	30/10
Nalbuphine (IV)	30/10
Oxycodone (IV)	30/20
Remifentanyl (IV)	250/1
Sufentanyl (IV)	30/0.015

IV = intravenous
*As an example, for a patient taking 40 mg of oxycodone daily, the morphine equivalent amount is calculated by multiplying this value by the appropriate ratio: (40 mg oxycodone) x (30 mg morphine/20 mg oxycodone) = 60 mg morphine.

Graph 1. Morphine Equivalent Amount (MEA) conversion ratio for common opioids used during the perioperative period.

CONCLUSION

The management of postoperative pain control in opioid dependent patients requires a strong foundation with detailed history and physical. Determining the patient's preoperative daily opioid requirement, MEA, and associated psychiatric disorders are important factors towards successful postoperative pain management. Chronic opioid users may require referral and treatment in the preoperative and postoperative period in order to achieve opioid independence. Successful perioperative pain control would require a multimodal approach with various regional/neuraxial blockade as indicated. Following recommendations based on the patient's degree of preoperative opioid use will provide greater advancement towards achieving successful postoperative pain management.

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