

Acute Pain Management Following Facial Plastic Surgery



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KEYWORDS

• Opioids • Pain • Septorhinoplasty • Rhytidectomy • Blepharoplasty

KEY POINTS

- Pain control after septorhinoplasty has been extensively studied with numerous randomized control trials exploring a variety of nonopioid analgesics. Most patients require fewer than 10 to 15 opioid tablets for adequate control of pain.
- Evidence in oculoplastic procedures is limited to the use of local anesthetics. Facelift procedures have limited evidence for nonsteroidal antiinflammatory drugs (NSAIDs), although their use may be limited secondary to concern for hematoma formation.
- There is evidence that major head and neck reconstructive procedures with free tissue transfer can be managed with a limited amount of opioid pain medication, instead substituting with a multimodal analgesic protocol including acetaminophen and NSAIDs.

INTRODUCTION

Acute pain control after surgery is an important factor for patient satisfaction and clinical outcomes. Although opioids are very effective in the treatment of pain, their use has come under extreme scrutiny because of the increase in addiction and opioid-related deaths in the United States and other countries. Judicious use of opioids is appropriate; however, inadequate treatment of pain has shown negative effects on quality of life, increased hospital readmissions, and increased length of stay for patients undergoing surgery. Clinicians and researchers have used several strategies to determine the appropriate number of opioid pain pills to prescribe. These strategies include consideration of alternative analgesics and combination therapies, using analgesics in the preoperative setting, and setting appropriate expectations with the patients and families regarding the degree of postoperative pain.

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This article explores the evidence available to support these alternative modalities for the treatment of acute surgical pain in a series of common facial plastic procedures, including septorhinoplasty, oculoplastic surgery, rhytidectomy, otoplasty, and free flap reconstruction procedures (Table 1). It presents an evidence-based review and combines it with the authors' clinical experience.

Septorhinoplasty

Septorhinoplasty is one of the most common procedures performed by facial plastic surgeons and otolaryngologists. As such, the greatest amount of available evidence regarding perioperative analgesia is available for this procedure. The quality of evidence is strengthened by several randomized control trials and a meta-analysis. This article presents the available evidence and combines it with our own clinical experience.

Nguyen and colleagues¹ published the only systematic review on the use of nonopioid analgesia regimens following septoplasty and/or rhinoplasty. There were 37 published articles, including several randomized single-blinded and double-blinded trials evaluating evidence for the perioperative use of alpha agonists such as dexmedetomidine and xylometazoline, nonsteroidal antiinflammatory drugs (NSAIDs), gabapentinoids (pregabalin and gabapentin), local anesthetic agents, and other agents, including ketamine, magnesium, β -blockers, and acupuncture.

The strongest evidence was available for the use of local anesthetics followed by gabapentinoids. NSAIDs and alpha agonists were considerations; however, their use may be limited by their side effect profile. Fourteen articles were analyzed, all of which were randomized control trials, including several high-quality studies. Local

Analgesia	Benefit	Harm	Recommendation	Dosing
Local anesthetics	Rapid onset, safe	Local irritation, toxicity with systemic absorption	Strongly recommended	Minimal amount needed to achieve analgesia up to the following: Bupivacaine 2–3 mg/kg Lidocaine 5–7 mg/kg
NSAIDs	Safe, widely used	Bleeding, GI upset, nausea	Option	Celecoxib 200 mg twice daily Ketorolac IV 30 mg once
Gabapentionoids	Neuromodulator, reduces pain scores	Potential for abuse	Option	Gabapentin 300 mg daily Pregabalin 300 mg daily
Acetaminophen	Widely used, safe	Liver toxicity with overdose	Strongly recommended	Acetaminophen 500 mg every 6 h

Abbreviations: GI, gastrointestinal; IV, intravenous; NSAIDs, nonsteroidal antiinflammatory drug.

anesthetics were found to be safe, rapid, and efficacious at decreasing other pain medication requirements in this review. The investigators recommended their use given these findings.

NSAIDs are a valuable component in the armamentarium for pain control; however, their risk profile for bleeding may limit use. NSAIDs are cyclooxygenase inhibitors, which decrease the formation of prostaglandins and thromboxane A₂ and lead to pain control as well as decreased platelet function. Use has largely been limited because of the concern for bleeding. It is our practice, as well as that of other surgeons, to advise patients to avoid both preoperative and postoperative NSAIDs use because of the fear of epistaxis. This fear is compounded especially in septorhinoplasty, because the nose is a highly vascular area and the use of packing augments both pain and obstruction in the nasal cavity. The investigators reviewed 5 prospective double-blinded studies and found high-quality evidence that NSAIDs decrease postoperative rescue analgesic requirements; although no included studies specifically evaluated epistaxis, none reported significant bleeding either.

Seven prospective randomized controlled trials were included that evaluated gabapentinoids, which are medications, including gabapentin and pregabalin, that are thought to exert their effects by the inhibition of presynaptic voltage-gated calcium channels leading to decreased neurotransmitter release.² Although the dosage varied between studies, 6 of the 7 trials reported decreased pain scores compared with placebo. Drowsiness and dizziness limit their safety profile and their use must be carefully considered in elderly patients. These medications can be considered adjunct and are especially helpful in the first 24 hours after surgery. Recently, there has been increased concern for the potential of abuse with these medications. The state of Michigan now lists gabapentin as a schedule 5 drug. Clinicians should exercise increased caution when prescribing this medication and obtain a consent similar to that for opioid medication.

There are several other articles in the literature that further discuss how best to treat pain and set appropriate patient expectations. Gozeler and colleagues³ explored in a randomized double-blinded study whether a single dose of 800 mg of intravenous (IV) ibuprofen given 30 minutes before septorhinoplasty would decrease perioperative opioid requirements. Fifty patients were administered either saline or ibuprofen before incision. Patients were given patient-controlled analgesia (PCA) following the procedure in their postanesthesia care unit. Patient who received IV ibuprofen reported less pain on a visual analog scale at all time points from 10 minutes to 24 hours after the procedure. They also had half the opioid consumption from their PCAs. The investigators concluded that the use of preoperative IV ibuprofen was effective as preemptive therapy to decrease postoperative opioid requirements.

Rock and colleagues⁴ recently conducted a retrospective review of 64 patients that underwent septoplasty or rhinoplasty. Although an average of 42.4 tablets were prescribed, patients consumed a median of 14.7 tablets. Similarly, Patel and colleagues⁵ reported a case series of 62 patients and found that patients used a median of 8.7 tablets postoperatively with 75% using less than 15 tablets. Sclafani and colleagues⁶ compared septoplasty and rhinoplasty for postoperative opioid requirement and similarly found that 90% of patients required fewer than 11 tablets for optimal control.

Aulet and colleagues⁷ recently reported a case-control study before and after enactment of a local state regulation requiring physicians to check a prescription monitoring system before prescribing opioids. The investigators reviewed 80 patients evenly divided between both groups and found that, although the number of tablets prescribed decreased nearly in half (18.2 pills to 9.7 pills), there was no increase in the number of complaints or additional opioid pain medication prescriptions. These

studies provide important information for counseling patients on expectations regarding pain postoperatively.

It is currently our practice to prescribe 15 tablets of hydrocodone-acetaminophen 5 mg/325 mg to our patients undergoing septorhinoplasty and to have patients transition to acetaminophen alone as their pain continues to improve. A formal discussion about the untoward effects of opioid medication must be had with each patient as well. Postoperative nausea and constipation can be alleviated with prescriptions of Zofran ODT and increased consumption of water with a possible stool softener. A discussion of the functional outcomes and pain satisfaction with the procedure may also affect perception of pain and postoperative analgesic requirement, and these should also be discussed with each patient during the preoperative visit.⁸

Aging Face

In contrast with the wealth of studies addressing septorhinoplasty, considerably fewer studies are available for surgeries addressing the aging face. The available evidence for oculoplastic procedures (brow surgery and blepharoplasty) and aging face surgeries (facelift and neck lift) are discussed next.

Brow lifts are often performed under deep sedation or general anesthesia. There is a paucity of data published regarding postoperative pain control and brow lifts. There have been no investigations into the amount of opioids prescribed, the amount consumed, use of adjunct pain medications (eg, ketorolac), neuromodulators (eg, pregabalin), or long-acting local anesthetics (eg, liposomal bupivacaine). Patients who experience preoperative headaches may continue to experience headaches afterward, although the frequency may decrease.⁹ These patients should continue to be treated in a similar fashion as preoperatively. Future robust studies should be initiated to identify safe and efficacious pain regimens with restrained but appropriate use of narcotics and adjunctive medications and modalities.

In general, blepharoplasty is performed under local anesthesia with sedation. Infiltration of local anesthetic can be painful and often invokes fear among patients. EMLA cream, composed of lidocaine and prilocaine with 25 mg/1 g, has been investigated as a preinjection treatment of upper lid blepharoplasty. In a surgeon-blinded randomized trial, 64% of untreated patients had moderate to severe pain during injection, which decreased to 14% in the cohort of patients treated with EMLA cream.¹⁰ In addition, in a follow-up retrospective study by Saariniemi and colleagues,¹¹ EMLA cream, when used preoperatively for 15 minutes, was not associated with increased postoperative swelling or bruising, poor wound healing, unfavorable scar appearance, and need corrective procedures. Surprisingly, eye irritation was more common in the control group (EMLA, 0% vs control, 11%; $P = .03$).¹¹ In addition to pretreating patients with topical anesthetics, proper injection technique is of absolute importance for maximal patient comfort. In a systematic review, effective maneuvers for decreasing injection-associated pain included modifying the solution (buffering, dilution, warming), skin cooling, tactile distraction (eg, vibration), and low rate of injection.¹²

Postoperative pain associated with isolated blepharoplasty is low and patients primarily rely on acetaminophen for postoperative analgesia. However, to limit acetaminophen intake, physicians have begun investigating administering preemptive analgesics. In randomized controlled double-blinded study of 52 patients, a single dose of 150 mg of pregabalin or placebo was administered to patients 15 minutes before undergoing upper eyelid surgery (ie, blepharoplasty, ptosis repair, canthoplasty, eyelid retraction repair, pentagonal wedge resection, and Mohs reconstruction).¹³ On postoperative visual analog pain scores, the pregabalin group reported

pains scores on average 5.5 points lower than the control groups up to 48 hours postoperatively. In addition, the pregabalin group consumed 50% less acetaminophen (1.3 g) on average compared with the control group (2.6 g) for the first 48 hours after surgery. However, future large-scale studies are required to fully elucidate the role these neuropathic pain modulators may play in oculoplastic pain control regimens. However, no study has investigated the safety or efficacy of use of NSAIDs or opioids in oculoplastic blepharoplasty.

Evidence for acute management of pain following facelift surgery is limited in the medical literature. One of the earliest reports in the literature is by Hoefflin,¹⁴ who in 1992 reported his practice to administer IV dexamethasone and diphenhydramine combined with a topical mist of Kenalog and bupivacaine into the surgical field to decrease surgical pain.

Aynehchi and colleagues¹⁵ evaluated the use of celecoxib for patients undergoing deep plane facelift. In this retrospective study, 50 patients were given both preoperative and standing postoperative celecoxib, whereas 50 patients did not receive any dosing. The treatment group reported decreased pain and required almost half the number of opioid tablets compared with the nontreatment group. The study did not comment on the incidence of postoperative hematoma.

Jones and colleagues¹⁶ investigated the use of postoperative facial cooling on 1 side of the face with the other side as the control. The use of the cooling mask increased facial swelling but did not decrease pain on that side of the face. Torgerson and colleagues¹⁷ investigated the use of ketorolac in a prospective randomized trial of 140 patients. Ninety-five patients received locally injected therapy, 20 patients received intramuscular doses, and the remaining patients received local anesthetic alone. Patients who received locally injected ketorolac required significantly less postoperative analgesic than both the other groups.

Based on the data presented here and the theoretic risk of postoperative hematoma that can lead to flap necrosis, it is currently our practice to prescribe hydrocodone-acetaminophen and transition patients to acetaminophen as soon as their pain improves. We do not use drains in our surgery and rely on meticulous hemostasis combined with Tisseel (Baxter Healthcare) tissue adhesive spray containing sealer protein and thrombin to convert fibrinogen into a fibrin clot.

Otoplasty

The medical literature is limited regarding acute pain management with otoplasty. One case report discusses the use of a cervical plexus block with levobupivacaine resulting in the patient requiring no postoperative pain medication.¹⁸ In another study, Cregg and colleagues¹⁹ examined 43 children randomized to local anesthetic anterior and posterior with lidocaine to the pinna or a regional nerve blockage using levobupivacaine. Children were followed for 24 hours afterward. There were no differences in postoperative opioid requirements in these patients.

It is currently our practice to locally ring block the patient with a mixture of 0.5% lidocaine 1:200,000 epinephrine combined with an equal concentration of 0.25% Marcaine. Younger patients require liquid analgesia, whereas older patients are prescribed the standard 15 pills of opioid medications.

Free Tissue Transfer

Management of pain in complex head and neck reconstruction involving free tissue transfer can be difficult. Morbidity and pain from both the reconstruction site and donor site can amplify analgesic requirements. Patients and physicians may have

different expectations regarding appropriate pain control. Despite the use of opioid PCA, patients may have inadequate control of their pain.²⁰

Chiu and colleagues²¹ explored the use of a single preoperative dose of gabapentin in patients undergoing anterolateral thigh free flap reconstruction for tongue defects. Fifty consecutive patients were included in this study. Half of the participants were administered 1200 mg of gabapentin preoperatively, whereas the other half did not. The investigators reported a decrease in visual analog scale pain scores and morphine PCA requirements in the first 24 hours postoperatively.

Carpenter and colleagues²² analyzed the use of celecoxib in patients undergoing head and neck surgery with free flap reconstruction. In a retrospective review, patients who received celecoxib had decreased oral, IV, and total opioid requirements.

Eggerstedt and colleagues²³ conducted a retrospective cohort study comparing patients receiving a protocol of multimodal analgesia compared with a traditional regimen in patients undergoing head and neck free flap reconstruction. The multimodal regimen consisted of preoperative oral and IV acetaminophen and oral gabapentin. Postoperatively, patients received scheduled oral acetaminophen, gabapentin, celecoxib, and 3 days of as-needed IV ketorolac. Further requirements were satisfied with fentanyl, either IV push or PCA in opioid-tolerant patients (up to 24 hours). The control group received acetaminophen, hydrocodone-acetaminophen, and IV morphine as needed. The investigators compared morphine-equivalent doses and found a substantial decrease in the multimodal analgesia, in which patients required an average of 10.0 equivalents compared with 89.6 in the traditional analgesia group. Protocols such as this can be used to decrease opioid use even in the most complex head and neck reconstructions.

SUMMARY

Pain after facial plastic surgery procedures can vary widely based on procedure and patient factors. There are several strategies that clinicians can use to reduce the overall opioid requirements for these patients. It is incumbent on physicians to continue to educate patients on expectations regarding pain. Physicians must continue to search for novel approaches to treat pain and continue to reduce reliance on opioid pain medication to help curtail the overwhelming public health crisis.

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