

Pain management in the plastic surgical patients

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Abstract

Pain is the oldest medical problem and is of major concern in the surgical patient. Perception of pain is always subjective and is whatever someone says it is. While preparing the patient for an elective plastic surgical procedure it is important to neither minimize nor exaggerate the amount of pain the patient will experience in the post-operative period. Strategies for management of post-operative pain begin with an appreciation of neuro-anatomy and physiology. Pain begins with application of a noxious stimulus which is conducted by several pathways to the cortex, limbic system and brainstem where pain is localized, emotionally registered and responded to. Endogenous systems are in place to modulate and minimize pain. The opioid centric model of pain management involves administration of exogenous opioids either orally or parenterally which act on receptors located throughout the central nervous system and the body. Concerns about exclusively utilizing the opioid centric approach are overdose, developing dependence as well as other side effects such as nausea and constipation. The approach used to treating the patient's pain in the opioid centric model will differ depending on whether the patient is opioid naive or opioid tolerant. Management of pain in the patient with a substance use disorder and the patient taking buprenorphine or naltrexone are special cases and need advance planning. The current approach to pain management minimizes excessive narcotic administration and instead utilizes a multi-modal and sometimes multidisciplinary methodology. This strategy emphasizes long acting local anesthetics, nerve blocks and a

variety of other medications that work at different levels of the pain transmission continuum. Additionally, adjunct techniques such as TENS, acupuncture, herbal remedies and guided imagery should be considered.

Most patients who undergo cosmetic surgery do not report pain during the immediate postoperative period. However, most patients who underwent liposuction combined with or without other plastic surgical procedure suffer pain after surgery. There are three main techniques in acute pain management postoperatively which are systemic analgesia, regional analgesia, and local/topical analgesia, and these are the extent of trauma during the procedure, surgeon's skill, prior disease, location and type of incision, and psychological and cultural factors. Treatment for each type of plastic surgery and the resulting pain require techniques that can be used as single method or combined with each other to relieve postoperative pain after plastic surgery. Nausea, vomiting, constipation, somnolence, etc., are well-known adverse effects of opioids. Although these effects may seem minor, they can lead to significant complications following some type of plastic surgeries, for example, face-lift hematoma following nausea and vomiting, pulmonary complications from respiratory depression, and even thromboembolic phenomena from bed rest following prolonged opioid use. Multimodal pain management has been documented to increase patient satisfaction and reduce both opioid use and the incidence of PONV. Combination of pain management in plastic surgery included patient-controlled analgesia intravenous (PCA-IV), patient-controlled epidural analgesia (PCEA), patient-controlled

regional analgesia (PCRA), field block (TAP block), continuous wound infusion system using pain pump and tumescent analgesia with local anesthetics.

Any patient scheduled for a surgical procedure requires a preoperative pain assessment and treatment optimization plan. This plan should include educating the patient about expectations as well as addressing the various options for pain management. In addition, the impact of concurrent medications on pain management and knowledge of the patient's concomitant conditions (whether physiological, psychological, or both) could help clarify the specific strategy for pain control. Some such conditions include the presence of sleep apnea or factors linked to a predisposition for persistent postoperative pain, such as catastrophizing or anxiety. Each section offers a succinct, accurate review of the given topic, including a complete reference list. In the case of the chapter, "Barriers to Optimal Pain Management in the General Surgery Population," the authors included a case study that could be used in the academic context to start a discussion with a learner. This is but one example of clinically important topics that touch on multimodal analgesia, management of neuropathic postoperative pain, and pain management in patients with substance abuse disorder. The authors offer specific recommendations for pain management in these common situations. Postoperative pain management in plastic surgery has become a topic of increasing interest. Pain is the perceived sensory and emotional reaction to actual or perceived tissue injury.¹ Nociceptive pain is caused by suprathreshold stimulation of peripheral pain receptors from damage to nonneural tissue.² Inflammatory pain results from peripheral pain sensitization caused by

activation of the immune system via chemical mediators. Surgery causes tissue injury that leads to both nociceptive and inflammatory pain. Pathologic pain is caused by dysfunction of the nervous system without tissue damage; it is maladaptive in that it serves no biological function. Uncontrolled postsurgical pain has been associated with increased risk of poor pulmonary function, myocardial ischemia, ileus, thromboembolism, and impaired immune function.^{4,5} It has been associated with increased postanesthesia care unit stays, prolonged admissions, and increased readmission rates, all of which may affect reimbursement and patient satisfaction.^{6–11} Uncontrolled postsurgical pain has also been implicated in the development of persistent postsurgical pain (PPSP) caused by maladaptive neuronal plasticity.^{12,13} PPSP is estimated to affect 20% to 25% of mastectomy patients, 50% to 85% of amputation patients, and 5% to 35% of hernia repair patients. In the era of the American opioid epidemic, surgeons play a crucial role in optimizing postoperative pain and minimizing narcotic use. Nonpharmacologic pain management strategies such as mindfulness, massage, and acupuncture have been found to be effective pain management strategies and should be used.¹⁶ This article reviews pain management strategies available to plastic surgeons based on therapeutic class of medication and provides a framework for pain management based on Enhanced Recovery After Surgery (ERAS) protocols. Much of this content was previously covered in a Plastic and Reconstructive Surgery Pain Management Research has shown that more than 50% of patients have insufficient postoperative pain relief despite the use of multiple pain management modalities. Insufficient pain relief leads to several pathophysiological effects.