

Pain-Minimizing Strategies for Nail Surgery

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Nail surgery is an important part of dermatologic training and clinical practice, both for diagnosis and treatment of nail disorders as well as benign and malignant nail tumors. Patient comfort is essential prior to the procedure and while administering local anesthetics. Effective anesthesia facilitates nail unit biopsies, excisions, and other surgical nail procedures. Pain management immediately following the procedure and during the postoperative period are equally important.

Patients who undergo nail surgery may experience anxiety due to fear of a cancer diagnosis, pain during the surgery, or disfigurement from the procedure. This anxiety may lead to increased blood pressure, a decreased pain threshold, and mental and physical discomfort.¹ A detailed explanation of the procedure itself as well as expectations following the surgery are helpful in diminishing these fears. Administration of a fast-acting benzodiazepine also may be helpful in these patients to decrease anxiety prior to the procedure.²

Attaining adequate anesthesia requires an understanding of digital anatomy, particularly innervation. Innervation of the digits is supplied by the volar and dorsal nerves, which divide into 3 branches at the distal interphalangeal joint, innervating the nail bed, the digital tip, and the pulp.³ Pacinian and Ruffini corpuscles and free-ended nociceptors activate nerve fibers that transmit pain impulses.^{4,5} Local anesthetics block pain transmission by impeding voltage-gated sodium channels located at free nerve endings. Pain from anesthesia may be due to both needle insertion and fluid infiltration.

Simple measures can maximize patient comfort during digital anesthesia. Both audiovisual distraction and interpersonal interaction can help to put the patient at ease.^{6,7} Application of topical anesthetic cream (1–2 hours prior to the procedure under occlusion),⁸ ice (at least 6 minutes),⁹ or an ethyl chloride spray can be applied to the nail folds prior to needle insertion to alleviate injection pain, but these methods do little for infiltration pain. Use of an ethyl chloride spray may be the preferred technique due to the rapidity of the analgesic effects (Figure).¹⁰ A vibrating massager also can be applied in close proximity to the site of needle insertion.¹¹

Proper anesthetic preparation and technique also can minimize pain during injection. Because lidocaine 1% is acidic (pH, 6.09), buffering with sodium bicarbonate 8.4% can result in decreased injection pain and faster onset of action.^{6,12} Warming the anesthetic using a water bath, incubator, or autoclave can decrease pain without degradation of lidocaine or epinephrine.¹³ At a minimum, 30-gauge needles are preferred to minimize pain from needle insertion. Use of 33-gauge needles has shown benefit for injecting the face and scalp and may prove to be helpful injecting sensitive areas such as the digits.¹⁴ A slow injection technique is more comfortable for the patient, as rapid injection causes tissue distention.¹¹

The ideal anesthetic for nail surgery would have a fast onset and a long duration of action, which would allow for shorter operation time as well as alleviation of pain postprocedure and some degree of vasoconstriction to help maintain a bloodless field. Lidocaine has the fastest time of onset (<1–3 minutes) but a short duration of action (30–120 minutes) and a vasodilatory effect. Bupivacaine takes 2 to 5 minutes to take effect and has a long duration of action (120–240 minutes) but a risk for cardiotoxicity. Ropivacaine is the preferred anesthetic by some nail surgeons because of its intermediate time of onset (1–15 minutes), long duration of action (120–360 minutes), and the benefit of some vasoconstriction.^{5,15} The addition of epinephrine has 2 main advantages: vasoconstriction and prolongation of anesthetic effects; the latter may help



Use of ethyl chloride spray to minimize pain while performing a wing block procedure.

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to alleviate postoperative pain. If there are no contraindications to its use (ie, severe hypertension, Raynaud phenomenon), it can be used safely in digital anesthesia without risk for ischemia or infarction.¹¹

Digital anesthesia can be achieved by infiltration or using nerve blocks. One major difference between these 2 approaches is the time of onset of anesthesia, with the former being nearly instantaneous and the latter taking up to 15 minutes.¹⁶ There also usually is more prolonged pain at the site of needle insertion with nerve blocks compared to infiltration. The type of nail surgery being performed, the digit involved, and surgeon preference will determine the anesthetic method of choice.¹⁷

Pain management immediately following the procedure and for several days after is essential. Use of a longer-acting anesthetic, such as bupivacaine or ropivacaine, will provide anesthesia for several hours. A well-padded dressing serves to absorb blood and protect the nail and distal digit from trauma, as even minor trauma can exacerbate pain and bleeding. The patient should be instructed to apply ice to the surgical site and keep the ipsilateral extremity elevated for the next 2 days to reduce edema and pain.¹⁵ Written instructions are helpful, as anxiety during and after the procedure may limit the patient's understanding and recollection of the verbal postoperative instructions. To maximize readability of the information, the National Institutes of Health and American Medical Association recommend that the instructions be written at a fourth- to sixth-grade reading level.^{18,19}

A single dose of ibuprofen (400 mg) or acetaminophen (500 mg to 1 g) immediately before or after the procedure can reduce opioid use and postoperative pain.²⁰ Gabapentin (300–1200 mg) given 1 to 2 hours before surgery may be considered in patients who are at high risk for postsurgical pain.²¹ Acetaminophen or nonsteroidal anti-inflammatory drugs (eg, ibuprofen [200–400 mg]) administered every 4 to 6 hours provides considerable pain reduction postprocedure. Nonsteroidal anti-inflammatory drugs may be superior to acetaminophen for pain control²² and carry a low risk for postoperative bleeding.²³ Additionally, a combination of acetaminophen with a nonsteroidal anti-inflammatory drug for 3 doses may be more effective than either drug alone.²⁴ Some patients may require an opioid combination, such as codeine plus acetaminophen, for a short time (up to 3 days) for pain relief following surgery. Excessive pain or pain lasting than more than 3 days is not normal or expected; in these cases, patients should return to the office to rule out ischemia or infection.

It is important to implement pain-minimizing strategies for nail surgeries. Because many of these approaches are derived from other surgical specialties, well-controlled clinical trials in patients undergoing nail surgery will be necessary to improve outcomes.

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