

Wrist Block for Procedures in the Hand: A Surgeon's Perspective

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Wrist level nerve blocks are valuable tools for the surgical treatment of traumatic and degenerative conditions in the hand. Advantages include less expense and time compared to alternatives. Patients appreciate the 6-8 hours of analgesia provided by long acting local anesthetic agents. Dosage is typically lower and administration is distant to major vascular structures, giving a safety advantage compared with other regional techniques (intravenous regional or plexus blocks). Nausea, confusion and other problems seen with general anesthetics are not encountered. The ability of a comfortable awake patient to cooperate with the surgeon intraoperatively may be of considerable value, especially in tendon transfer or balancing procedures, where extrinsic muscular activity is desired.

There are risks related to toxicity of local anesthetics and inadvertent needle injury to neurovascular structures. Risks can be minimized by proper needle placement and adherence to guidelines for maximum anesthetic dosage. The volume of agent required for successful wrist level nerve block is usually well below the maximum permissible dose. Aspiration prior to injection decreases systemic risk from injection into arteries or veins. Use of epinephrine is appropriate at the wrist but more distal injection may result in avascular tissue injury. Epinephrine prolongs the block and decreases bleeding. Bupivacaine produces a block of four times the duration of lidocaine, but requires more exact block placement and has a slower onset. I usually use 0.5% bupivacaine. Significant nerve injury can occur from intraneural injection of anesthetic. Proper technique places the anesthetic into the space surrounding the nerve. An awake patient is essential for safety; they can report paresthesias from inadvertent intraneural needle placement prior to injection. The needle is then withdrawn slightly prior to injection.

Block Placement

Three major and two minor nerves supply the hand. For complete anesthesia of the hand, each must be blocked. However, many procedures are site specific in which case only some nerves must be blocked. The median nerve innervates the dorsal digits, palmar thumb, index, long and half of ring digits. The ulnar nerve supplies the remainder of the palm and fingers. The radial sensory nerve territory includes the dorsal surface bridging the thumb and index digits, as well as a variable portion of the dorsal hand. A minor branch of the ulnar nerve, the dorsal ulnar sensory nerve transits from palmar to dorsal at the level of ulnar styloid to supply the dorsoulnar hand. A palmar sensory branch of the median nerve is located between the flexor carpi radialis tendon and the tendon of the palmaris longus.

Blocking the Median Nerve:

The median nerve is located slightly radial and deep to the tendon of palmaris longus. This tendon becomes prominent when the patient touches the thumb to the small finger with the wrist slightly flexed. A needle placed perpendicular to the skin at the wrist flexion crease, slightly ulnar to palmaris longus tendon, will enter the carpal canal without endangering the median nerve (Figure 1, A). Penetration to a depth of 3/4 inch with a 25 gauge needle will allow placement of 5-10 cc of local anesthetic around the median nerve.

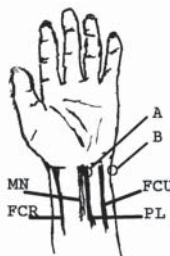


Figure 1

Blocking the Ulnar Nerve:

The hard spot in the "heel" of the hand (hypotenar prominence) corresponds to the carpal pisiform. Moving proximal to the wrist crease allows palpation of the flexor carpi ulnaris tendon; the ulnar artery and nerve lie beneath. Their relationship is the same orientation as radial artery and median nerve: the artery is radial. Therefore, a needle stick dorsal and ulnar to the tendon directed ulnar to radial will reach the nerve before the artery (Figure 1, B). A 5/8" 25 gauge needle has enough length to allow 5-10 cc of local anesthetic injection around the artery. Aspirate prior to injection and be alert to paresthesias from nerve irritation.

The ulnar nerve may also be blocked at the elbow. There is advantage in the precise superficial anatomic location of the nerve. It can be palpated readily one finger width below the bony medial epicondyle in the cubital tunnel. After block at this level, the patient will have a motor block of ulnar innervated extrinsic muscles as well, a potential problem during tendon surgery. Having personally experienced painful paresthesias from ulnar nerve block at this level, I prefer block at the wrist.

Blocking the Radial Sensory Nerve:

The radial nerve exits from under the brachioradialis muscle 4 cm proximal to the wrist. At the level of the wrist the nerve divides into 3 branches, supplying the dorsal thumb and index finger. Subcutaneous injection from the radial styloid prominence to the midline dorsum of the wrist will adequately block this nerve. (Figure 2)

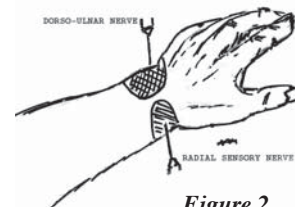


Figure 2

Minor nerves:

Usually the dorsal ulnar sensory nerve and palmar cutaneous nerve can be ignored, especially for procedures involving the digits. For complete anesthesia they can be blocked subcutaneously dorsal and radial to the ulnar styloid and radial and superficial to the palmaris longus tendon. (Figure 2)

Practical Points:

Patients are put at ease by a confident approach and a simple explanation of the technique. The use of NEUT (SODIUM Bicarbonate) mixed 1:10 with the local anesthetic will decrease the initial burning pain after injection. Total volumes can be limited to 10 - 20 cc's with well placed blocks. Injecting slowly will also decrease patient discomfort and anxiety, allowing analgesia to slowly take effect. 25 or 27 gauge needles are appropriate.

The position of the patient's hand is sometimes a problem during block of ulnar or median nerves. Many patients cannot supinate the hand sufficiently to achieve a comfortable position. In this case, have the patient turn on their side to gain the needed rotation of the hand.

Most problems of inadequate anesthesia occur when the block is hurried or poorly placed. Therefore, I prefer to perform the block in the preoperative area, allowing adequate light, space and time.

Prolonged use of a tourniquet may be difficult. The area under the upper arm tourniquet cuff, and more importantly, the muscles of the arm and forearm are not anesthetized by these techniques. If the required bloodless field is for 10-15 minutes, most patients can cope with the discomfort. For longer procedures, tightly wrapping only the distal forearm with an elastic bandage may provide a well tolerated dry surgical area. A rubber penrose drain 1/4" wide may be secured as a digital tourniquet.

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Analgesia of the hand and wrist lasts well beyond the surgical procedure. This provides good post operative pain control yet allows the patient to move digits as encouraged by the surgeon. However, patients should be cautioned of the unnoticed injury that may occur in the numb hand including cuts and burns. Special caution should be exercised when applying dressings and splints, to avoid tightness or pressure leading to injury.

Good Times in the Land of Mickey

Over 425 participants suffered through clear blue skies and 70° temperatures to attend the 29th Annual ASRA Spring Meeting in Orlando, March 11-14th. Despite this sacrifice, all available data suggest that most attendees actually returned home with enthusiasm for regional anesthesia and a renewed sense of connection with old friends and colleagues.

Several new initiatives highlighted this year's spring meeting. One of these was ASRA President, Terese Horlocker's, unfailing effort to have every faculty member and dignitary wear the ASRA logo as a tattoo...but that's a story best left for another time. The *Consensus Conference on Infectious Complications of Regional Anesthesia* considered available literature and expert opinion to help guide everyday practice issues that have 'no good answer'. Examples include what constitutes acceptable aseptic technique during block placement, when to offer regional anesthesia to the infected or immunocompromised patient, or how to deal with infected interventional pain management hardware. Recommendations from this conference will be published in *Regional Anesthesia and Pain Medicine* later this year. Another successful new concept was the New Techniques and Approaches in Regional Anesthesia—Theory and Practical Application. This session solely occupied Sunday morning, holding the interest of over 100 participants. In essence, experts presented 15-minute mini-lectures on five relatively new regional techniques, followed by rotating workshop sessions. For many of the participants, it was their first exposure to neonatal spinals, cervical paravertebral blocks, or new approaches to the sciatic nerve. Other unusual presentations included a fascinating history of the epidural blood patch, plus the ASRA Special Lecture, which dealt with veterinary pain medicine.

More traditional topics included updates on regional anesthesia and pain medicine practice. Newer methods for nerve localization were discussed, including improvements in peripheral nerve stimulation and ultrasonography. Evidence was presented to help define best practices for such common surgeries as knee arthroscopy or total knee arthroplasty. Outcome data was critically assessed for the role of regional anesthesia and analgesia in optimizing patient care after major or ambulatory surgery. Lastly, David L. Brown, MD, Professor and Chair, University of Iowa, presented an enthralling Labat Lecture. In it, he chronicled how the anesthesiologist's concept of risk has changed and expanded during the time from Labat until present day.

The success of this meeting was in no small part due to the extraordinary efforts of the faculty, management personnel, and attendees. In addition, the presence of our many international guests added spirit and valuable insights. I extend my personal thanks to all of these wonderful colleagues. Orlando is now in the past, so we hope you will plan to attend ASRA's 30th Annual Spring Meeting in Toronto, April 21-25, 2005.

Joseph M. Neal, MD
Program Chair

Op Ed

Atta boy/atta girl! In the last issue of the Newsletter I commented about not enough or too much analgesia (Has the pendulum swung too far in post operative pain control?). This time I write about getting it just right – an epidural for labor and delivery for someone near and dear to me. Reluctant at first to have an epidural, the patient now “loves” her anesthesiologist for giving it to her. What the epidural did far exceeded her expectations – good pain relief with non painful sensation and motor function. Mother and baby are fine, dad is as happy and as proud as can be. Good science, good teaching, good application, fair reimbursement (and wonderful patients) – it is great when they are in synch. Note for the chart: APA – another perfect anesthetic!

James E. Heavner, DVM, PhD
Editor

Resident Research Award

The American Society of Regional Anesthesia and Pain Medicine is awarding a \$1000 stipend to five residents and/or pain fellows to facilitate attendance at the 2004 Annual Fall Pain Meeting and Workshops. Applicants must be a member of ASRA. Preference will be given to resident members who have submitted abstract(s).

Applications should include:

- Letter of nomination from the applicant's fellowship director
- 1-2 page bibliography
- A copy of the submitted abstract.

Please send completed application to:

Timothy J. Brennan, MD, PhD

Chair, ASRA Research Committee

The American Society of Regional Anesthesia and Pain Medicine

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Scholarship recipients will be notified in September.

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