The occasional digital nerve block

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In performing regional anesthesia of the fingers and hand, there are several general principles that need to be identified. The first is to relax. Successful blocks get easier with repetition. Most rural physicians do not perform them weekly or monthly, so it may take a while to get comfortable with them, and repeat blocks may be required for any given procedure.

PRELIMINARY PRECAUTIONS

1. Ensure that you have performed and documented any neurologic and vascular assessment before injection. Most injections will be performed with a 25-gauge needle. Because the needle will often be adjacent to an artery, aspiration before injection is needed. Paresthesia on initial needle placement indicates that the needle is in the nerve, and withdrawing slightly until it is absent identifies a safe injection site. Paresthesia does occur (older texts routinely used them as "landmarks"), so be slow and cautious with the pace of the needle insertion and injection.
2. Epinephrine containing anesthetic agents should not be used. There has recently been some debate about this in the fields of orthopedic and plastic hand surgery; a changing practice is developing in which epinephrine is being used along with a local anesthetic.[1–3] This change in practice does not necessarily extend medicolegally to the rural practitioner, when most textbooks still clearly admonish the use of epinephrine, particularly in finger anesthesia.[4,5]
3. The traditional ring block for digital nerve anesthesia is no longer a preferred technique owing to its lower safety profile from the tourniquet effect of anesthetic volume used.[6]
4. Use of lidocaine is common. If multiple injections are used, the toxicity range of 4 mg/kg needs to be considered (e.g., 20 mL total of 1% lidocaine may be toxic for a 50-kg patient if it rapidly becomes intravascular; 10 mL for a 2% solution). Toxicity is less of a concern when instilled into soft tissue, where it will be slowly absorbed and metabolized. Toxicity is more likely to be an issue with a hematoma block, which typically involves use of larger volumes and may function as a rapidly absorbed intraosseous infusion. This toxicity presents with a metallic taste in the mouth and may be followed by a seizure. Bupivacaine is a common, longer-acting equivalent choice for finger and hand anesthesia.

Digital nerve block is not synonymous with ring block.[7,8] Remember that there is a volar and a dorsal digital nerve on each digit. They bifurcate just proximal to the metacarpophalangeal joint, the visible knuckle. Finger anesthesia can be performed in 3 ways: web-space block, metacarpophalangeal block and ring block.

EQUIPMENT

- 25-gauge 3/4-inch needle
- lidocaine

WEB-SPACE BLOCK

This block is the easiest to perform and has been found to be the most effective digital block.[9] Simply insert a 25-gauge,

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3/4-inch needle completely into the web space. Insert to a depth of about 1 inch and inject 3 mL of lidocaine (Fig. 1). This will likely reach both aspects of the digital nerve at or near their bifurcation.



Fig. 1. Web-space block: insert to a depth of about 1 inch.

METACARPOPHALANGEAL BLOCK

Metacarpophalangeal block is performed on the dorsum of the hand just proximal to the visible knuckle joint.[10] The needle is entered perpendicular to the skin, behind the visible knuckle, and advanced until the palmar aponeurosis is felt or the palmar skin is tenting. Then instill 3 mL of lidocaine (Fig. 2). Some clinicians enter the skin at an angle and advance the needle toward the web space until the needle is seen tenting there and then inject a similar volume.[7] Some lidocaine can be kept and used when the needle is almost out of the skin to tunnel subcutaneously across the metacarpophalangeal area and deposit a subcutaneous wheal, so that the entry point of the second injection is anesthetized in advance. The other side of the metacarpophalangeal area is entered in the same fashion with another 3 mL of lidocaine instilled.



Fig. 2. Metacarpophalangeal block: enter behind the visible knuckle and aim for the web space at the palm.

RING BLOCK

Because there is no place for fluid to expand as in the previous approaches, this commonly employed method may leave the patient exposed to a potential compartment syndrome.[7,8] Use it cautiously and not at all in patients with poor vascular health. The classic approach is 1–1.5 mL of lidocaine on each side of the digit.[11] The needle enters the dorsal finger skin just distal to the web space and the 1-mL volume is injected, partly at the dorsal branch and then further advanced to the volar branch of the digital nerve. The needle basically slides along the side of the finger as each nerve receives an injection. The total volume in the finger should total 3 mL or less (Fig. 3).

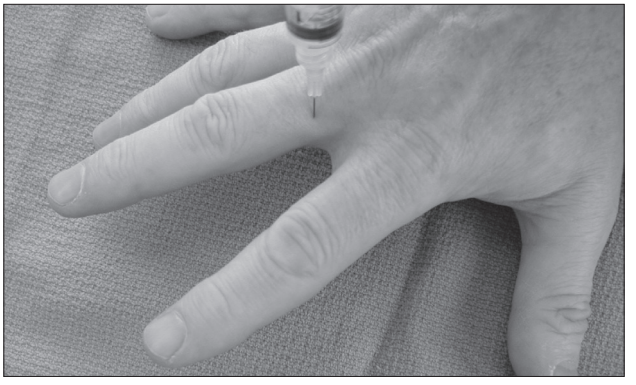


Fig. 3. Ring block: move the needle to reach both the dorsal and volar branches of the digital nerve.

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