Chapter 10

Blocks around the Elbow

- Musculocutaneous Nerve Block at the Elbow
- Radial Nerve Block at the Elbow
- Median Nerve Block at the Elbow
- Ulnar Nerve Block at the Elbow




These blocks are typically used as "rescue" blocks or if longer-acting blocks are required for postoperative pain relief. For example, if an infraclavicular, axillary, or supraclavicular block has been done and a specific peripheral nerve has been missed, the nerve can be blocked at the elbow. Similarly, if a short-acting drug such as mepivacaine has been used and a longer action of the block in a specific area of the distal arm is required, that specific nerve can be blocked at the elbow using a longer-acting drug. The use of an elbow block for total surgical anesthesia of the distal arm has proved disappointing because the antebrachial cutaneous nerve and cutaneous part of the musculocutaneous nerve are sensory nerves. These sensory nerves are difficult to block reliably, although the use of ultrasonography may facilitate this aspect of the procedure.

MUSCULOCUTANEOUS NERVE BLOCK AT THE ELBOW

Technique

The nerve is situated between the biceps brachii and brachialis muscles on the lateral side of the arm, just proximal to the elbow. Placing two fingers of the nonoperative hand into the groove between these two muscles to separate them and injecting approximately 10 mL of local anesthetic agent between these muscles will block the musculocutaneous nerve (Fig. 10-1). At this level, the nerve is a sensory nerve.

The musculocutaneous nerve can also be blocked at the elbow by subcutaneous infiltration, as illustrated in Figure 10-2, but blockade of the musculocutaneous nerve in the axilla, where it is still a mixed motor and sensory nerve, is probably

FIGURE 10-1 Injection of the musculocutaneous nerve at the elbow.

FIGURE 10-2 Injection of the musculocutaneous nerve below the elbow.

FIGURE 10-3 Injection of the radial nerve at the elbow.

FIGURE 10-4 Injection of the median nerve at the elbow.

more reliable. The musculocutaneous nerve innervates the biceps brachii and brachialis muscles, and stimulation of the nerve causes elbow flexion.

RADIAL NERVE AT THE ELBOW

Technique

The point of needle entry is halfway from the biceps brachii tendon to the lateral epicondyle of the elbow joint, as demonstrated in Figure 10-3. After a skin wheal is raised, a 22-gauge, 50-mm stimulating needle, attached to a nerve stimulator set at a current output of 1 to 2 mA, a frequency of 2 Hz, and pulse length of 100 to 300 µsec, enters the skin perpendicularly. A distinct "pop" can be felt as the needle penetrates the extensor muscle, and this is immediately followed by an extensor motor response at the wrist joint.

The nerve stimulator is now turned down and the needle adjusted such that a brisk motor response is still detectable at the wrist at a stimulator output of 0.3 to 0.5 mA. This indicates correct needle placement, and 5 to 10 mL of local anesthetic agent can be injected.

MEDIAN NERVE BLOCK AT THE ELBOW

Technique

The point of needle entry is halfway from the biceps brachii tendon to the medial epicondyle of the elbow joint, as demonstrated in Figure 10-4. The blue mark in Figure 10-4 indicates the biceps tendon, whereas the median artery can usually be palpated, and the nerve is situated just lateral of this artery. After a skin wheal is raised, a 22-gauge, 50-mm stimulating needle,

FIGURE 10-5 Transcutaneous stimulation of the ulnar nerve proximal to the elbow.

FIGURE 10-6 Injection of the ulnar nerve proximal to the elbow.

attached to a nerve stimulator set at a current output of 1 to 2 mA, a frequency of 2 Hz, and pulse length of 100 to 300 µsec, enters the skin perpendicularly. A flexion and pronation motor response at the wrist joint indicates that the median nerve is stimulated.

The nerve stimulator is now turned down and the needle adjusted such that a brisk motor response is still detectable at the wrist at a stimulator output of 0.3 to 0.5 mA. This indicates correct needle placement, and 5 to 10 mL of local anesthetic agent can be injected.

ULNAR NERVE BLOCK AT THE ELBOW

Technique

It is important to avoid the ulnar nerve in the sulcus ulnaris area because injection here inevitably causes ischemic nerve injury.

The ulnar nerve is situated just anterior to the triceps muscle in the medial aspect of the arm, as demonstrated in Figure 9-10.

The ulnar nerve can be stimulated transcutaneously by using a specially designed transcutaneous probe (Fig. 10-5), or it can be palpated anterior to the triceps muscle by following it proximally from the sulcus ulnaris.

The point of needle entry is approximately 5 cm proximal to the elbow joint (Fig. 10-6). After a skin wheal is raised, a 22-gauge, 50-mm stimulating needle, attached to a nerve stimulator set at a current output of 1 to 2 mA, a frequency of 2 Hz, and pulse length of 100 to 300 µsec, enters the skin perpendicularly. Flexor and ulnar deviation at the wrist joint indicates ulnar nerve stimulation.

The nerve stimulator is now turned down and the needle adjusted such that a brisk motor response is still detectable at the wrist at a stimulator output of 0.3 to 0.5 mA. This indicates

correct needle placement, and 5 to 10 mL of local anesthetic agent can be injected.

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