

## Continuous Brachial Plexus Block

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Continuous spinal and epidural anesthesia have been extensively documented in the literature. Although continuous brachial plexus block has been described,<sup>1</sup> the technique is not widely used.

With the advent of plastic needles and Winnie's concept of the perivascular sheath containing the brachial plexus,<sup>2</sup> continuous anesthesia is easy to accomplish. We have used the continuous technique for the past three years whenever extensive upper-extremity surgery which might outlast the duration of local anesthetic agents as used in a single-injection technique was contemplated.

The subclavian perivascular technique of brachial plexus anesthesia has the advantage over the supraclavicular technique, as it minimizes the possibility of pneumothorax. The patient is placed in the supine position with the head turned to the side opposite the side being injected. The groove between the anterior and middle scalenus muscles is outlined. One must not be confused by the groove between the sternocleidomastoid and anterior scalenus muscles! If the proper groove is palpated, one can usually feel the pulsation of the subclavian artery. When the anatomic landmarks have been identified, the skin overlying an area high in the interscalene triangle is anesthetized locally. For the indwelling catheter any of the commercially available "Rochester" type plastic needles may be used. Needle size is relatively unimportant, our preference being in the 15- to 18-gauge range. The needle is introduced through the skin wheal parallel to the long axis of the body between the anterior and middle scalenus muscles. The level of insertion is high in the interscalene triangle. After the needle has been advanced a variable distance, usually

about 2.5 cm, it will pass through an easily-discernible layer of fascia immediately below which paresthesia in the upper extremity usually is elicited. Because the plastic portion of the needle may not be in the sheath when the paresthesia occurs, it is important that the needle be advanced at least 0.5 cm before the stylet is withdrawn. If the plastic portion of the needle is then advanced 1.0 cm or so into the sheath there is reasonable assurance that it will remain in place even if the patient moves his neck vigorously. The needle is taped securely and an intravenous extension tubing is attached to permit remote injection.

Once the catheter is in position it may be left in place for several days if necessary, being used not only for surgical anesthesia, but also for postoperative analgesia. Injections are made with volumes and concentrations similar to those used for single-injection techniques, being mindful of recommended safe dosage per unit of time.

The indications for continuous brachial plexus anesthesia are those for any upper-extremity block in which the surgery is expected to outlast the effects of conventional local anesthetic agents. We have found continuous brachial plexus anesthesia very satisfactory for long surgical procedures involving the entire upper extremity. Patients tiring of prolonged immobility may require sedation. The longest procedure in which this technique was used has been nine hours, with the average being approximately five hours. We have encountered no untoward effects in the 25 cases in which we have used this technique to date.

### REFERENCES

1. Ansbros, F. P.: Method of continuous brachial plexus block, *Am. J. Surg.* 71: 716, 1946.
2. Winnie, A. P., and Collins, V. J.: The subclavian perivascular technique of brachial plexus anesthesia, *ANESTHESIOLOGY* 25: 353, 1964.

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