cause them to distend. If paraesthesia is encountered, we redirect the needle, and we do not inject in the presence of pain or paraesthesia, or against unusually high resistance (although this last feature is subjective, not measured).

If the definition of Bigeleisen et al. is correct, we are performing intraneural injections with a mean volume of 33 ml of local anesthetic on a daily basis, although we believe that we are depositing local anesthetic outside the nerves of the plexus, after breaching extraneural fascial layers. In a recent case series from our institution, evidence of possible neurologic injury was sought from 510 consecutive supraclavicular blocks. Two instances of numbness in the fingers of the operative hand were found in retrospect. Both of these had resolved spontaneously after several weeks and were not commented on at surgical follow-up.

Given our question about their definition of intraneural at the level of the supraclavicular brachial plexus block, we would reserve judgment on the generalizability of the results of Bigeleisen et al. to nerves in other anatomical sites. An examination of the question of stimulating thresholds and nerve injury, particularly in relation to the perineurium, would be of great interest, although we would be wary of conducting such a study on human subjects.

Whichever term is used for the outer border of the brachial plexus, the technique of supraclavicular block that we describe seems to be safe and reliable. We firmly believe that neurologic complications of regional anesthesia must be the subject of continued investigation, both in terms of quantifying the incidence and understanding the means of avoidance, and we congratulate Bigeleisen et al. for their contribution to our understanding of the subject.

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References


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In Reply:

We thank Drs. Morfey and Brull for their response to our recent observations. They raise some important questions on the ability of minimum stimulating current to detect intraneural needle placement and to predict neurologic injury after intraneural injection. Their most important question, however, concerned the reliability of our measurements: how sure are we that the needle tip was outside and inside the nerve during extraneural and intraneural measurements, respectively? Their question concerning what would be the outer layer of the supraclavicular brachial plexus is very reasonable. In their ultrasound-guided supraclavicular block procedure, accompanied by figures before and after injection, they describe that during the block this outer layer is intentionally breached, which is often felt as a loss of resistance or “pop.”

We have the same experience. At this site, the nerve fascicles are surrounded by epineurial layers, as shown in figure 4 of our original article. The configuration of epineurial layers may differ depending on the site of formation of the nerve trunks and cords of the brachial plexus. In addition, as stated in our discussion, adjacent to the epineurial layers, fascial layers that are continuous with the prevertebral and scalenic layers may differ depending on the site of formation of the nerve trunks and cords of the brachial plexus. In addition, as stated in our discussion, adjacent to the epineurial layers, fascial layers that are continuous with the prevertebral and scalenic layers...
We thank Drs. Mofrey and Brull for their interesting contribution to the continuing discussion on a possible relation between intraneural injection and neurologic injury.

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A Case of Accidental Hypotension Caused by Drug Leakage through the Rubber Piston in a Prefilled Inoven Injection 0.3% Syringe

To the Editor:

The use of prefilled syringes is recommended as a strategy to minimize errors in intravenous drug administration during anesthesia and intensive care.1 Prefilled syringe formulations of potent cardiovascular drugs are available to provide rapid access for critically ill patients. The prefilled syringe that requires assembly is composed of two parts: A plastic syringe plunger and an airtight syringe barrel with a rubber piston at one end and the enclosed drug. The operator has to assemble the syringe by fitting the plunger to the piston at an appropriate position before fixing the syringe into the syringe pump. We encountered a rare case of accidental hypotension as a result of failed dopamine delivery caused by drug leakage from a Prefilled Inoven injection 0.3% syringe (marketed by Kyowa Hakko Kirin Co., Ltd., Tokyo, Japan; manufactured by Terumo Corp., Tokyo, Japan). This leakage was noticed approximately 4 h after the start of the syringe pump infusion and appeared to be caused by plunger/piston misassembly. We report this case briefly to draw special attention to hazardous misassembly that may occur when using a prefilled syringe requiring assembly.

The case involved an elderly patient admitted urgently to our hospital for the treatment of pneumonia and dehydration. To manage his hypotension of 60/42 mmHg, a dopa-