

acid (or of procaine) can reverse the effect of 5,000 molecules of sulfanilamide against hemolytic streptococci in culture.³ Similarly, 2.5 mg *para*-aminobenzoic acid was shown to substantially reverse the effect of 25 mg sulfanilamide against experimental streptococcal infection in mice.⁴ It thus seems prudent to avoid benzocaine and chlorprocaine in sulfonamide-treated patients.

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How to Proceed Following a "Failed Spinal"

To the Editor:—I read with interest the letter of Drasner and Rigler.¹ I agree that with continuous spinal analgesia the caudal direction and sacral position of a subarachnoid catheter can lead to restriction of the spread of local anesthetics,² subsequently causing a cauda equina lesion.³

The mechanism of failure of a single spinal dose is altogether different. The position of the needle is in the lumbar region, and the local anesthetic is free to move in the subarachnoid space, controlled mainly by its baricity and the curvature of the spine. There are many known causes of failed spinal block, including partial position of the needle bevel in the epidural space, intravascular injection, inadequate dosage, or the use of a local anesthetic drug past its expiration date.

An important cause of failure, which is rarely stressed, however, is the low site of lumbar puncture, *e.g.*, L4-L5 for a cesarean section. An inadequate block may result because of the longer distance the local anesthetic has to travel in order to reach the higher thoracic segments of the spinal cord, together with an appreciable amount of drug loss to the caudal area due to the position of the injection site at the down-slope of the lumbar curvature. Repeated injection of the same dose at a higher interspace leads to a successful block. In training centers, failure of spinal anesthesia after a single dose is not a rare event. We have successfully used a second spinal injection in hundreds of cases over many years, without complications. The following precautions should be taken when administering a second dose:

1. One should wait 10 min to make sure that the first block has reached its full extent; spread is slower in some patients than in others. Moreover, this period of time allows fixation of the initial dose, thus minimizing the "free" portion of the local anesthetic in the subarachnoid space.*

2. One should avoid adding epinephrine or opioids to the second dose if these were added to the first. Excessive doses of epinephrine can lead to neurologic complications, and excessive doses of opioids can lead to respiratory depression.⁴

In conclusion, we believe that a second spinal block, especially in situations of high-risk aspiration pneumonitis or potential difficult intubation, is far safer than a hypothetical problem that applies only to continuous spinal anesthesia.

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* Ayers HD versus United States. 750F, 2nd, pp 449-457 (5th Cir., January 17, 1985).