Laboratory Note

New Techniques for Spinal Anesthesia in the Dog

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Administration of spinal anesthesia to a dog is a difficult technical procedure with unpredictable results and serious neurologic complications because: a) the superior lamina overrides the inferior lamina, allowing a small interlaminar space; b) the subarachnoid space contains little cerebrospinal fluid; c) the spinal cord extends to the level of lumbar vertebra 6 or 7. Despite these anatomic limitations, we have been uniformly successful in administering spinal anesthesia to dogs using the following techniques.

Methods

The anesthetized (pentobarbital, 25 mg/kg) dog (15–22 kg) is placed in the lateral position on a flat surface and held in extreme dorsal flexion. After washing (pHisoHex) and shaving the area, a disposable 25-gauge × 3½-inch spinal needle with stylet (Monoject) is introduced in the midline at the inferior border of the interspinous space at the level of the superior iliac crests and advanced cephalad at an angle of about 45 degrees to the skin. When the needle is maintained in the midline and advanced very slowly, two "pops" can usually be felt, the first as the needle passes through the ligamentum flavum and the second as it passes through the dura at a depth of approximately 2 inches. Upon removal of the stylet, spinal fluid may or may not appear, nor can it always be aspirated. Despite this, injection of local anesthetic consistently produces excellent spinal anesthesia. When the needle cannot be passed through the interlaminar space, a second technique is tried. A disposable thin-walled 18-gauge × 2½-inch caudal needle (Monoject) with the stylet in place is advanced approximately perpendicularly to the vertebral lamina at the level of the superior iliac crests, or 1 vertebra above this point, until bone is encountered. Then, with one hand holding the needle firmly supported against the animal's back, the needle is gently tapped through the bone with a mallet until a sudden loss of resistance is felt; this indicates entrance into the epidural space. The stylet is then removed and the 25-gauge × 3½-inch spinal needle is inserted through the larger needle until the dural "pop" is felt. Figure 1 shows the spinal needles inserted into the subarachnoid space by this second technique.

Results and Discussion

With these two techniques we have been consistently successful in performing spinal anesthesia in ten consecutive dogs. The second procedure was necessary in four dogs, but we attribute this to inexperience. Tetracaine, 1.5 ml of a 1 per cent solution, plus 1.5 ml of 10 per cent dextrose and a head-down tilt of about 25 degrees for 10 minutes with the dog supine, has produced complete sympathetic blocks in all animals. This was tested by a head-up tilt (45 degrees) of the dog. In the control animal, or in the animal in which the spinal block was unsuccessful, a 5-minute tilt test produced a
slight transient fall in blood pressure with a compensatory increase (about 10 per cent) in heart rate. In the animal with sympathetic block, blood pressure started falling about a minute after injection of the anesthetic and became so low with the head-up tilt that this maneuver had to be aborted after about a minute; there was no compensatory increase in heart rate. No respiratory arrest occurred, but one dog developed transient loss of motor control of the hind legs following spinal anesthesia. In this dog, the needle inadvertently slipped deeper than intended and presumably damaged the cord. The animal began regaining use of his hind legs in about 48 hours.

References