Intralymphatic Injection: Another Complication of Lumbar Sympathetic Block

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MANY complications of lumbar sympathetic blocks have been reported, including increased swelling of the blocked extremity after injection.1-4 This usually has been attributed to increased blood flow secondary to vasodilatation rather than to any intralymphatic process. However, we present a case in which lumbar sympathetic block, performed by standard technique and confirmed with fluoroscopy, resulted in spread of solution into the lumbar lymphatic chain. This event raises the possibility of lymphatic damage during sympathetic blockade. The purpose of this report is to make clinicians aware of this possibility and to discuss the possible complications that may arise.

Case Report

A 45-yr-old woman presented to the emergency room with a fractured left tibia and fibula from a motor vehicle accident. She underwent open reduction and internal fixation but continued to have persistent pain in her leg several months after the procedure. She presented to the pain center with a history of burning pain around her knee associated with coolness of the entire leg. Physical examination revealed obvious discoloration and a mottled appearance of the extremity. Her pulses were normal, as was capillary refill. Temperature measurements showed the affected leg to be 4°C cooler than the nonaffected leg. Doppler studies of the extremities showed no abnormalities in the vascular system.

Because her history and physical examination were consistent with reflex sympathetic dystrophy, the patient underwent diagnostic lumbar sympathetic block with 0.25% bupivacaine, which resulted in pain relief for 4 days. Two other lumbar sympathetic blocks were performed, and each resulted in pain relief for approximately 1 week.

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At this time it was decided to proceed with percutaneous lumbar sympathectomy with phenol. The technique used was a standard three-needle technique with 22-G needles placed 7–8 cm from the midline, lateral to the vertebral bodies of L2, L3, and L4 according to anterior–posterior fluoroscopy. The needles were advanced until the tips were at the anterior edges of L2, L3, and L4 according to lateral fluoroscopy. Confirmation with the anterior–posterior view showed the needle tips at the lateral margin of each vertebra. After negative aspiration, 1 cm³ hypaque contrast material was injected through the needle at L2, resulting in distribution of contrast in lymphatic vessels from the needle tip at the lower part of the L2 vertebral body (fig. 1). Repeated fluoroscopic views at 1 and 5 min showed no evidence of washout either cephalad or caudal to the needle tip. Multiple attempts to aspirate blood during this period were negative. The needle then was withdrawn several millimeters, and after negative aspiration, injection of contrast material resulted in the typical linear

![Fig. 1. Fluoroscopic radiograph after injection of contrast material at the anterolateral edge of the L2 vertebral body. Contrast is seen spreading in lymphatic vessels from the needle tip at the lower part of the L2 vertebral body.](http://anesthesiology.pubs.asahq.org/pdfaccess.ashx?url=/data/journals/jasa/931310/)
spread at the anterior edge of the vertebral column, according to lateral fluoroscopy. A total of 3 cm³ of 8% phenol in hypaque was injected through each needle, which were removed after injection of 0.5 cm³ air to prevent tracking of phenol. The patient developed a very effective lumbar sympathetic block and showed no problems after discharge from the pain center.

Discussion

Complications that have been reported after lumbar sympathetic blocks include puncture of a major vessel, puncture of the renal pelvis or ureter, subarachnoid injection, perforation of a disk, ejaculatory failure, and chronic back pain.1-7 To our knowledge, ours is the first report of intralymphatic injection occurring during sympathetic blockade. Although the patient in this case suffered no apparent complications, we have seen one case in which a patient developed a mass in his right flank several days after a right lumbar sympathetic block with bupivacaine was performed using one needle placed at the L2 vertebral body. Sonography showed a large retroperitoneal cystic mass (fig. 2), from which several hundred cubic centimeters of orange-tinted fluid consistent with lymphatic fluid were drained. Subsequent exploratory laparotomy revealed a large retroperitoneal lymphocele, which was removed without sequelae.

Injection into the lumbar lymphatic chain is certainly a potential risk and probably occurs more often than clinicians realize. In the patient presented in this case, intralymphatic injection occurred despite needle placement performed under fluoroscopic guidance using a standard technique.5,6 According to the lateral fluoroscopic view, the needle tips were located posterior to the vertebral body edge, where one would not expect lymph nodes to be located. Retroperitoneal lymph nodes usually are situated anterior to the lumbar vertebrae and around the major vessels (aorta, vena cava, and common iliac) and not in the area of the sympathetic chain at the anterolateral vertebral edge.7 In patients receiving lumbar sympathetic blocks, however, increased pressure from the prone position or from aorticaval compression may cause displacement of these lymph nodes posteriorly into the area of the sympathetic chain. This is possible especially in patients who are obese, as was the patient in this case.

The potential danger from intralymphatic injection is lymphatic obstruction with secondary lymphocele formation or lower extremity edema. This may occur because most of the drainage from the lower extremities passes through this retroperitoneal pathway. The etiology of lymph obstruction may be due to actual lymphatic vessel damage secondary to neurolytic agents or pressure from high volumes of solutions or secondary to a local inflammatory response adjacent to the vessels.

The purpose of this report is to make clinicians aware of the possibility of intralymphatic injection during sympathetic blocks and to show the appearance of this complication on a fluoroscopic radiograph. This case also confirms the benefit of fluoroscopy used during performance of sympathetic blocks; fluoroscopy should be routine when neurolytic agents such as phenol are used. In the event that a block is performed under flu-

Fig. 2. Retroperitoneal ultrasound of the right flank area showing a large cystic mass. The four small crosses mark the outer dimensions of the peanut-shaped mass.
oroscopic control with contrast, and spread appears as in figure 1, intralymphatic injection may be differentiated from intravascular injection by the lack of washout within a period of seconds as one would expect if arterial or venous injection was made.

References


Paraplegia after Continuous Subdural Meperidine Infusion

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NEUROLOGIC injury, including paraplegia, continues to be a rare but devastating complication of epidural anesthesia.1-3 In most cases, the mechanism of the injury remains unexplained.4 We report a patient who developed an incomplete mixed sensory and motor neurologic deficit after an epidural catheter was used to provide surgical anesthesia and postoperative pain management.

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Case Report

A 63-yr-old woman was scheduled for a hysterectomy and resection of a mature teratoma. Because of severe bronchial asthma, an epidural anesthetic was chosen. A 17-G Weiss needle was placed using a loss-of-resistance technique to introduce an 18-G bullet-tipped side-holed polyamide catheter. Placement of the catheter was technically difficult, and blood was encountered on the first three attempts. The fourth attempt was successful at L1-L2, with no blood or cerebrospinal fluid on aspiration of the catheter. After a test dose of 3 ml 2% lidocaine with epinephrine 1:200,000, anesthesia was achieved at level of T4 bilaterally with 12 ml 2% lidocaine with epinephrine, and surgery was begun. A total of 12 ml 0.5% bupivacaine was given over 5.5 h. Blood pressure was labile and treated with fluids and phenylephrine infusion. Preoperative blood pressure had been 140/80 mmHg. Phenylephrine infusion was begun at 85/40 and titrated to maintain 110-130/70/80. This was tapered and discontinued in the postanesthesia care unit, and an epidural infusion of preservative-free meperidine 0.2% was begun at 7 ml/h.

On the morning of the first postoperative day, the patient was moving uneventfully with assistance from bed to chair. At 12:00 pm she complained of inability to move her legs. This was not accompanied by any pain in her legs or back. She was evaluated and found to have motor weakness from the level of the hip flexors down, with loss of sharp and dull discrimination below the knees and sharply diminished reflexes at the knee and ankles bilaterally. The epidural infusion was discontinued, and 7 ml blood-tined fluid was aspirated from the catheter. Laboratory studies at that time revealed normal prothrombin time, partial thromboplastin time, platelet count, and bleeding time. The catheter was left in place. The Department of Neurosurgery was consulted, and a magnetic resonance imaging scan of the thoracic and lumbar spine was obtained. This revealed multiple compression fractures of thoracic and lumbar vertebral bodies. A fluid collection surrounding the thecal sac was identified from T4 to L5 (fig. 1). Multiple air bubbles were present within the fluid collection. The fluid and air collection was in the subdural space.