A case study:
Postoperative spinal anesthesia following
intraoperative intercostal nerve blocks

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In this case report, the authors describe a high spinal anesthesia with changes in circulatory variables that occurred in a thoracotomy patient following intraoperative intercostal nerve block. A spinal anesthesia must be included in the differential diagnosis of cardiopulmonary and central nervous system depression when intercostal nerve block is used during thoracotomy.

An intraoperative intercostal nerve block is an accepted technique to alleviate postoperative incisional pain associated with thoracotomy. Since pneumothorax does not occur in thoracotomy patients who have chest tubes, the usual complication from this nerve block is a toxic reaction from the absorbed drug. Recently, however, a total spinal anesthesia was reported from the intrathoracic intercostal nerve block performed under direct vision at the time of surgery.

This report describes a second such complication, a postoperative high spinal anesthesia resulting from intraoperative intercostal nerve blocks. The complication was transient and the patient was discharged from the hospital without sequela.

The case
A 45-year-old man with Hodgkin's disease (nodular sclerosing type) was admitted for an exploratory thoracotomy because of a recurrent left hilar mass which had increased in size despite chemotherapy. The patient had a staging laparotomy and two thoracotomies for the above disease process in the past. Otherwise, history and physical examination were normal. Hemoglobin was 11.9 g% and the other laboratory studies were normal.

The patient was premedicated with meperidine 75 mg and atropine 0.4 mg IM. Anesthesia was induced with fentanyl 2 ml and thiopental 300 mg IV. Tracheal intubation was facilitated with succinylcholine 80 mg IV. Anesthesia was maintained with 0.75-1.0% halothane in a 50% mixture of N₂O and O₂. Muscle relaxation was provided with succinylcholine drip. The chest cavity was entered through the fifth intercostal space and the exploration and open biopsy of the tumor were performed. The systolic blood pressure ranged from 120 to 110 torr and the pulse from 76-92 beats per minute.

Prior to closure of the chest, the intercostal nerves, two above and two below the incision, were injected with a total of 20 ml of 1.0% etidocaine. Within two minutes the systolic pressure decreased from 112 to 70 torr and the pulse rate from 78 to 48 beats per minute. Responding to the rapid infusion of lactated Ringers solution 500 ml and metaraminol 0.5 mg IV, the systolic pressure increased to 112 torr but decreased again to 70 torr in approximately five minutes. Another bolus of metaraminol 0.3 mg IV and one unit of red blood cells (RBC) restored the systolic pressure to 120 torr. Upon turning the patient to the supine posi-
tion, the systolic pressure was 100 torr. The trachea was extubated while the patient was still on the surgical table.

Arriving in the recovery room, the patient’s blood pressure was 80/50 torr and the pulse rate 48 beats per minute. The skin was dry and warm on palpation. The second unit of RBCs was started. Approximately 20 minutes later, the patient complained that he could not move or feel his legs. The examination revealed a sharp sensory loss at the level of T₄. Within approximately 60 minutes after arriving in the recovery room, the patient was able to feel a dull sensation in his toes and move them on command. In one hour and 45 minutes he was able to move his legs and in approximately two hours and 30 minutes the systolic pressure stabilized at 100 torr. The subsequent hospital course was uneventful. There was no sequela.

Comment

The clinical manifestations of our patient were clearly those of a high spinal anesthesia. The persistent hypotension and bradycardia, a well-defined sensory loss and motor paralysis, and the temporal sequence of clinical recovery were all consistent with the above contention. The proposed mechanisms of this complication are: (1) the injection of local anesthetic into the dural cuffs surrounding the intercostal nerves which on occasion extend as far as several centimeters beyond the intervertebral foramen;² (2) the central spread of local anesthetic drug into the subarachnoid space through the perineural spaces;³ and (3) the inadvertent injection of local anesthetic directly into the subarachnoid space through an intervertebral foramen. Any or a combination of the above mechanisms may have been responsible for our complication.

Though a precise mechanism is not clear, our patient’s complication, as well as that reported by Benumof, indicates that spinal anesthesia must be included in the differential diagnosis of intraoperative and postoperative cardiopulmonary and central nervous system depression when intercostal nerve block has been used during thoracotomy.² The spread of local anesthetic drug into the subarachnoid space is an inherent danger when the intercostal nerve block is performed in the proximity of the spinal cord. As Benumof suggested previously, it is perhaps safer to perform this nerve block at a more peripheral point when the patient is awake so that its effects can be assessed accurately.

REFERENCES


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