An Alternative Technique for Interpleural Analgesia

To the Editor — The technique of interpleural analgesia (IPA) has been studied and reported in several publications in the past decade. In the past few years, IPA has gained in popularity because of its low rate of complications. However, catheter placement should be done postoperatively in spontaneously breathing patients to avoid unnecessary complications such as pneumothorax. On the other hand, catheter placement might be safe in patients with ipsilateral tube thoracostomy. However, postoperative catheter placement for IPA requires additional analgesics and takes time. Local analgesia might be a problem, especially, based on our own observations, in children after scoliosis operations with costoplasty.

Our approach, which was used postoperatively in a 14-yr-old child (weight, 48 kg; height, 158 cm) with an anterior release of the ribs, involved inserting an epidural catheter for IPA via the chest tube under direct visual guidance (fig. 1). Before IPA, the patient complained of shortness of breath as a result of inadequate pain relief. The chest tube was clamped, and 15 ml plain bupivacaine 0.5% with epinephrine 1:200,000 was given through the catheter (fig. 1) with the patient lying in the supine position. The chest tube, which was open to water seal before clamping, remained manually occluded for 10 min to avoid the loss of anesthetic fluid via thoracostomy drainage. Thereafter, the patient began to breathe normally and fell asleep. The patient was turned into the lateral position with the chest tube upward to ensure that the local anesthetic stayed in the thoracic interpleural space. The same anesthetic dose had to be repeated 8 h later with subsequent adequate pain relief.

The major advantage of inserting a catheter through the chest tube is that this is a painless and rapid way to position the catheter. The catheter is always located correctly provided that the position of the chest tube is verified. These findings were subsequently confirmed by the use of the technique in three more patients. Although another system has been described by using a device that combines chest drain and interpleural catheter for pain relief, our technique for IPA can be performed even when the indication for IPA was unpredictable at the time of original insertion of the chest tube.

Most surgeons may be reluctant to allow clamping of the chest tube for 10–15 min, especially when suction is being applied to the thoracostomy tube. If this is the case and if there is a second chest tube in place, this additional drainage system can be left unclamped, and the suction can be removed. The drainage tubing from this second system should be raised to a height of 10 cm above the patient’s chest before descending into the drainage bottle to allow air to escape while keeping any anesthetic liquid inside the pleural space.

In adults, large amounts of local anesthetic are usually required for pain relief because of dilution in the large thoracic cavity, and a relatively rapid increase in serum concentrations of local anesthetic have been found. No data exist about the safe dosage for children when using this technique. The toxicity of bupivacaine in children is unknown and based on data obtained from adults, although clinical reports of the use of IPA for analgesia after thoracotomy in children demonstrate that this technique appears to be effective and safe.

The efficacy of interpleural drug administration may be explained by the smaller size of the thoracic cavity in children compared with that of adults. Even a lower concentration of 0.25% bupivacaine with 1:200,000 epinephrine, either as a bolus injection or continuous infusion, may be attempted.

One might predict that a local anesthetic solution injected interpleurally would be distributed differently depending on the patient’s position. However, investigations with computed tomography after 20 min in the lateral position showed that there is no significant difference in the rostrocaudal distribution of the contrast medium compared with the supine position. However, in this study, no chest tube was used. Thus, if IPA is applied in combination with a chest tube, we recommend keeping the patient in the lateral position to prevent the anesthetic from running out after declamping, especially when suction is applied to the drainage.

In conclusion, this modified technique for IPA is rapid and safe. We believe that our modification provides advantages that further

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facilitate the use of IPA in situations where the indication for IPA was unpredicted.

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