Intrathoracic Migration of a Thoracic Epidural Catheter

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Abstract: A patient with intrathoracic migration of a thoracic epidural catheter is described. Migration may have occurred due to accidental puncture of parietal and visceral pleura by a Tuohy needle. The risk of producing a pneumothorax must be considered when attempting a continuous thoracic epidural blockade.

Key words: Complications; Epidural blockade, Tuohy needle, Epidural catheter

INTRODUCTION

Epidural blockade is commonly used for pain treatment at pain clinics. In particular, we use continuous epidural blockade with an epidural catheter for pain relief in herpes zoster.

However, there are rare complications, such as intrathoracic migration of the epidural catheter. We present a patient with intrathoracic migration of the epidural catheter after thoracic epidural needling.

CASE REPORT

A 77-year-old, 35 kg woman complained of right chest and axially pain for a month and clusters of small vesicles were noted on the right side of chest and back. A provisional diagnosis of herpes zoster affecting Th2-4 on the right side was made. She was initially treated with an antiviral agent and analgesics. The pain had an unbearable burning quality which persisted for a month. Therefore, she was referred to our pain clinic. She had a history of hypertension and Parkinson's disease. She had no previous history of back or spine pathology.

An 18-gauge Touhy needle was inserted at the Th4-5 interspace via a left paramedian approach. The epidural space was located by the loss of resistance technique using an air filled glass syringe. As needling was difficult, the angle between the needle and skin was reduced. The needle was advanced 6.5 cm from the skin. Immediately before "loss of resistance" was noted, the patient complained of a short sharp pain, and an epidural catheter was easily inserted 5 cm beyond the needle tip.

1% mepivacaine (2 ml) was injected as a test dose. Within 15 min of the injection the pain seemed almost relieved, but we could not determine the segments of sensory anesthesia because of her poor response. She did not complained of dyspnea.

After approximately 3 hr, contrast X-ray photograph were taken. The patient was in a supine position. After injection of 2 ml of iopamidol through the catheter, anterior-posterior photograph was taken. Then she was rapidly moved to a left lateral position, and right-left photograph was taken. The anterior-posterior photograph showed misplacement of the catheter in the right upper thoracic cavity with a small pneumothorax and opacification.
of the pleural space by contrast medium (Fig. 1). However, abnormal density on the right-left photograph appeared similar to that of the esophagus (Fig. 2).

The catheter had to be withdrawn immediately, and another needle was re-inserted at the Th5-6 interspace with a median approach. The loss of resistance was noted when the needle traveled 4.5 cm from the skin and catheter was inserted 5 cm further. Contrast chest X-ray were taken in the same way. The catheter was in the epidural space and contrast medium extended Th2-10 segments. The pain in chest was relieved, but we still could not confirm the segments of sensory anesthesia.

DISCUSSION

The second photograph taken in left lateral position showed an abnormal density similar to the esophagus. Figure 3 demonstrates where contrast medium may have been pooled. So the intrathoracic migration of the catheter was clear.

Continuous epidural blockade has a catheter misplacement rate as high as 1–16% [1-4]. When needling for thoracic epidural blockade by the paramedian approach, intrathoracic migration is most frequent. Shime et al. [5] reported that a large angle from the sagittal plane at the puncture can cause intrathoracic migration of catheter. Koch and Nielsen [6] described that nonresistance, identified by the “loss-of-resistance” technique, was probably associated
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Fig. 3. A C-T photograph of the patient one week later Fig. 1. An asterisk indicates the position where contrast medium may be pooled.

with the entrance of the Touhy needle into the pleural cavity directly after leaving the relatively tight paravertebral tissue.

As for our case, we consider that the inappropriate angle of the Tuohy needle from the sagittal plane must have caused this complication. It has been reported that an angle of 25 degrees from the sagittal plane is necessary\(^6\). The negative pressure identified by the "loss of resistance" technique must have been associated with the entrance of the needle tip into the pleural cavity on the opposite site. The patient felt a short sharp pain right before the "loss of resistance", and this would be an indication of parietal pleural puncture.

Usually, catheter position is determined by recognition of anesthetized segments after a test dose, but a clear response from the patient is necessary. Although we could not clarify the segments due to her age and Parkinsonism, we thought that epidural blockade was effective in decreasing of pain. Yanagawa et al.\(^7\) reported a case of intrapleural migration of an epidural catheter for post herpetic neuralgia. However, the patient had become pain free after the blockade. They described that the local anesthetics delivered through the catheter caused an intrapleural blockade. As for our case, we consider that her painlessness resulted from intrapleural blockade. Contrast chest X-ray photograph should be taken in patients with poor responses.

In conclusion, we described a rare case of pneumothorax after thoracic epidural blockade. This case suggested that the risk of causing pneumothorax by Tuohy needle and the importance of contrast X-ray photograph must be kept in mind when attempting a continuous thoracic epidural blockade.

REFERENCES