Case reports

Pulmonary haemorrhage after percutaneous paravertebral block

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We describe the management of a 65-yr-old woman anaesthetized for thoracotomy. The patient suffered a pulmonary haemorrhage after percutaneous paravertebral injection performed using the loss of resistance to saline technique. Thoracotomy at a later date revealed that the lung tissue had become adherent to the chest wall and that the paravertebral space was fibrosed secondary to previous surgery. This particular complication of percutaneous paravertebral block has not been reported previously and raises the question of risk vs benefit of this pre-emptive analgesic technique.

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A 65-yr-old woman presented for elective repair of a recurrent giant para-oesophageal hernia. She had undergone transthoracic Nissen repair of a hiatus hernia 16 yr previously. The presenting symptoms were epigastric discomfort and dyspepsia after meals, but she gave no symptoms of respiratory compromise, and was otherwise in reasonably good health. She weighed 65 kg and was 162 cm tall, with a body mass index (BMI) of approximately 25 kg m\(^{-2}\).

It is our practice in procedures which involve thoracotomy to perform single-shot percutaneous paravertebral injection with 0.5% bupivacaine 20 ml before the start of surgery. This is done after induction of anaesthesia with the patient appropriately positioned on the operating table. The surgeon subsequently places a paravertebral catheter under direct vision before closing the chest at the end of surgery. This was explained to the patient and verbal consent was given.

After premedication with lorazepam 1.5 mg and metoclopramide 10 mg, general anaesthesia was induced with midazolam 2 mg, fentanyl 200 µg and propofol 100 mg. Neuromuscular block was achieved with vecuronium 7 mg. A size 37-F Sheri-Bronch (Sheridan) left-sided, double-lumen endobronchial tube was positioned with good isolation of the left lung. The patient was positioned in the right lateral position on the operating table before the paravertebral block was performed. Anaesthesia was maintained with isoflurane and nitrous oxide in oxygen, and the patient’s lungs were ventilated using a Datex AS3 circle system with a tidal volume of 600 ml, ventilatory frequency 12 bpm and peak airway pressure approximately 20 cm H\(_2\)O.

The paravertebral injection was performed using a 16-gauge Tuohy needle and the loss of resistance to saline technique.1,2 The needle was inserted perpendicular to the skin and approximately 3 cm lateral to the midline at the level of the proposed thoracotomy incision. The needle was then walked off the superior border of the transverse process and advanced slowly until loss of resistance was encountered and saline was injected freely.

On this occasion, technical difficulty was encountered locating the paravertebral space and on the second pass of the needle, blood was aspirated freely at a depth of approximately 6 cm.3 After a short interval, blood was noted in the bronchial lumen of the double-lumen tube, and 150 ml of fresh blood were aspirated on suctioning. A rigid bronchoscopy was performed which showed the origin of the bleeding to be from the upper division of the left lower lobe. No active bleeding site was located. The patient remained cardiovasularly stable throughout and ventilation pressures and oxygen saturation were within normal limits. After discussion with the surgical and anaesthetic teams, it was felt wise to proceed with elective non-pulmonary surgery. Had we witnessed active haemorrhaging on bronchoscopy, or had the proposed thoracotomy involved resection of the area of lung in question, then it would have been appropriate to continue.

An urgent CT scan was performed after the patient was
awake. The scan showed a small haematoma around the thoracic spine and the aorta at the level of T6 (Fig. 1). There was also an area of lung haemorrhage in the left lower lobe at this level. There were multiple adhesions throughout the left lung fields which were likely caused by the previous thoracotomy for the Nissen fundoplication. These had resulted in tenting of the lung tissue where it had become adherent to the chest wall.

The patient was discharged from hospital after 3 days and re-admitted 2 weeks later for surgery which was completed without further incident. On this occasion, no preoperative paravertebral block was performed. It was confirmed during surgery that the pulmonary tissue was densely adherent to the chest wall and that the paravertebral space had been obliterated by inflammation.

**Discussion**

With the current resurgence of interest in the use of paravertebral block, we would advise caution in performing percutaneous paravertebral blocks in patients who have already undergone thoracotomy. This concern is based on the belief that inevitable adhesion formation tends to alter the anatomy of the paravertebral gutter and increases the risk of morbidity associated with this block.

In our current practice, percutaneous paravertebral injection is used as a pre-emptive analgesic before surgical incision. The paravertebral catheter which provides post-operative analgesia is placed under direct vision in the perioperative period and is consequently associated with minimal morbidity.

The role of pre-emptive analgesia is a contentious issue and of uncertain value. We accept that the serious complication rate associated with performing this block is relatively small. However, if the analgesic benefits it confers to the patient are minimal, its continued use does not seem justified. We plan to conduct a randomized clinical study to assess the effect of pre-incisional paravertebral block on the quality of postoperative analgesia in an attempt to answer this question.

**References**