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UNINTENTIONAL PLEURAL PUNCTURE AFTER THORACIC EPIDURAL - A CASE REORT

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Abstract : Thoracic epidural analgesia is one of the most effective and time tested modalities of providing effective post-thoracotomy pain relief. It also reduces postoperative pulmonary complications like atelectasis, impaired coughing, retention of secretions, infections etc. Nevertheless, being a blind procedure several complications have been associated with the technique. Pleural puncture is one rare complication that might occur following thoracic epidural catheterisation. This case report is about a 55yr old male who underwent thoracotomy for excision of right lung emphysematous bulla under general anaesthesia with thoracic epidural block. During surgery the catheter tip was found to be in the right pleural cavity. There was no evidence of bleeding or lung injury around the puncture site. The catheter was left in situ and was utilised to provide post operative intrapleural analgesia with local anaesthetic. We have discussed probable reasons for pleural puncture during epidural blockade and certain precautions which could possibly prevent technique related complications.

Keyword : pleural puncture, thoracic epidural catheter, complications, thoracotomy.

INTRODUCTION :

Epidural anesthesia was first reported by Sicard and Cathelin in France, in 1901. Thoracic epidural analgesia is a very efficient and time-tested method of providing intraoperative and postoperative pain relief for a wide range of surgical procedures including thoracotomy, thoracoscopy, sternotomy, upper abdominal surgeries. However, due to the blind nature of the procedure, it has been associated with several complications like failure to identify epidural space, dural perforation, post dural puncture headache, subdural placement of catheter, direct needle trauma to the nerve routes leading to radiculopathy, epidural hematoma, intravascular injection, venous air embolism, epidural abscess, total spinal/subdural anaesthesia, breakage of catheter, back ache, etc. Interpleural misplacement of a thoracic epidural catheter is one rare technique related complication (2-4% incidence). It may go unnoticed and uneventful or may produce life threatening complications such as hemothorax or pneumothorax. We have described one such case in which an intended epidural catheter was found to be misplaced in the pleural cavity.

CASE REPORT :

A 54yr old male patient, wt 70kg and ht 168cms and BMI 24.82 presented with chronic intermittent cough and breathlessness on exertion and was diagnosed to have an emphysematous bulla in the upper lobe of right lung based on his chest radiograph and CT chest findings. He had no comorbidities, no history of previous surgeries, his effort tolerance was 4 - 6 METS and his blood investigations were within normal limits. General and cardiovascular system examination were normal. Airway examination did not reveal any difficulty and his spine was normal. He was scheduled for an elective right upper lobe bulla excision. In the operating room, monitors were connected and baseline parameters were recorded. Patient was hydrated with 500ml of ringers lactate, premedicated with inj glycopyrrolate 0.2mg i.v. Epidural catheterisation was performed in the right lateral position with 18G tuohy's needle in the t7-t8 interspace through the median approach. After 3 attempts the epidural space could not be identified, hence the paramedian approach was tried and epidural space was identified using loss of resistance to air. Epidural catheter was inserted freely without any resistance and directed cephalad and fixed at 9 cms from skin level. There was no respiratory distress or cough during or immediately after the procedure. Test dose was given with inj lignocaine 1.5% 3ml with 1 in 2,00,000 adrenaline to rule out intrathecal or intravascular placement. Patient was induced as per institute protocol with inj.fentanyl, inj.thiopentone, inj.vecuronium and intubated with 35 french left sided double lumen endotracheal tube. Tube position was confirmed by auscultation. Anaesthesia was maintained with sevoflurane 2% dial setting with oxygen 2l and nitrous oxide 2l of fresh gas flow. Bladder was catheterised and patient was put in left lateral position. Prior to skin incision, inj.bupivacaine 0.25% 8ml was injected via epidural catheter after negative aspiration of blood/csf. Surgeon proceeded with thoracotomy. During the surgical procedure, there were no clinical signs indicating insufficient analgesia in the patient. After excision of bullae, the surgeon noticed the tip of the epidural catheter to be in the right pleural cavity. There was no evidence of bleeding or injury to the lung. It was decided to leave the catheter in place. Duration of surgery was 2 and a half hours. At the time of skin closure, inj.bupivacaine 0.25% 20ml with tramadol 100mg was injected through the epidural catheter and ICD was clamped for 30min. Diclofenac suppository 100mg was inserted before extubation to attenuate any visceral pain. Intraoperative course was uncomplicated and the patient was reversed and extubated.

Post operative monitoring and pain assessment were done in the ICU. A visual analogue score on a scale of 1 to 10, with 0 indicating no pain and 10 indicating worst possible pain, was used for pain assessment. Pain scores and vitals were monitored every

2hrs. A total of 3 boluses of 20ml bupivacaine 0.25% with tramadol 100mg were given every 8hrs for 24 hours, each time clamping the ICD for about 30mins after injection of drug. Patient was closely monitored for signs of local anaesthetic toxicity. Post operative analgesia in the patient was effective; with VAS scores between 1-3 and no additional analgesic was required. The patient's vitals were stable, except for once when he developed hypotension with systolic blood pressure of 90mmhg which responded to i.v. fluids and ephedrine 6mg administration. No side effects of local anaesthetic toxicity or related to opioid (tramadol) use such as nausea, vomiting, pruritus or respiratory depression was observed. The catheter was removed intact after 24hrs.

DISCUSSION :

A few such cases of misplacement of thoracic epidural catheter into the pleural cavity have been mentioned in literature(1-4). Such complications may be unnoticed and uneventful or may also produce life threatening hemothorax or pneumothorax. (5) Generally, epidural catheterisation is instituted by introducing the epidural needle through the midline. But failure to identify the mid thoracic epidural space through the midline approach could occur due to various factors such as inclined spinous process of mid thoracic vertebrae, narrow interspinous space characteristic of upper and mid thoracic vertebrae, calcified interspinous ligaments, spine deformities, improper positioning etc.

Literature reviews support the fact that the incidence of pleural puncture is higher with the paramedian approach than the median approach. The proposed reasons for the higher incidence of misplacement with this approach are inability to identify skin landmarks, inappropriate angle of insertion of the tuohy needle during paramedian approach, very thin individuals etc.(2,3) However, pleural puncture with the median approach have also been reported.(6,7) In our patient this complication could be recognised because the catheter tip was located in the ipsilateral pleural cavity. Cases of catheter misplacement into the contralateral pleural cavity have also been described, which might go unnoticed. (8) Since there was no evidence of bleeding or lung injury around the puncture site, the catheter was retained to provide interpleural analgesia. Inoue et al (1) described three cases of pleural puncture during thoracic epidural. Catheter was retained in all three cases to provide interpleural analgesia. It is a better modality when compared to other routes of pain relief like parenteral opioids, intercostal block etc. It has also been tried as a primary modalitiy of analgesia in thoracotomy procedures with success(9,10). The analgesic effect of local anaesthetic in interpleural route is due to its diffusion through the parietal pleura and intercostalis minimus muscle causing blockade of paravertebral nerves. Opioids can be added as adjuvants to local anaesthetics as opioid receptors have been identified in the peripheral nervous system. However, the complications of interpleural analgesia have to be kept in mind, such as requirement of large doses of local anaesthetic leading to toxicity, and also inferior and unreliable analgesic effect compared to epidural administration(11).

PRECAUTIONS DURING EPIDURAL CATHETERISATION :

Both loss of resistance technique and hanging drop technique cannot distinguish the pleural cavity from the epidural space. Also at higher thoracic level, the ligamentum flavum may fail to fuse in the midline, hence the tactile sensation of piercing the ligamentum flavum cannot be relied upon as a means of assessing the optimum depth of needle penetration. Hence the following precautions are suggested to perform successful catheterisation :

a) Optimal positioning of patient,

b) Avoiding multiple punctures in the same space to prevent f ormation of a subcutaneous false track,

c) If a resistance is encountered during catheter insertion it should be withdrawn. The catheter should
never be inserted forcefully.

d) Catheterisation should be done with the patient awake and sufficient time should be made available before proceeding with surgery to check sensory analgesia.

e) Injection of local anaesthetic and assessment of level of sensory analgesia should be done preoperatively - presence of bilateral sensory blockade would confirm epidural placement. If the blockade is unilateral then interpleural placement could be a possibility.

f) Determination of depth of epidural space from the skin can be done using ultrasound guidance, especially in patients who are obese and those with spine deformities.

g) Use of electrical stimulation has been shown to be a reliable real time technique to confirm catheter placement.

CONCLUSION :

We conclude by stating that while performing a thoracic epidural anaesthesia, it is important to keep in mind such rare technique related complications. If unintentional pleural puncture after epidural catheterisation is detected in a patient during surgery, administration of local anaesthetic through the intrapleural catheter could be considered as a potential alternative to the epidural route to provide postoperative analgesia after thoracotomy or thoracoscopy procedures, under stringent monitoring conditions.

REFERENCES :

(1) Inoue, Nishimine, Furuya. Unintentional intrapleural insertion of an epidural catheter.Should we remove it or leave it in situ to provide analgesia. Anesth Analg 2005;100:266-8.

(2) Furuya A, Takashi M, Ozaki M, Kumazawa T. Interpleural misplacement of an epidural catheter. JClin Anesth 1998;10:425-6

(3) Shime N, Shigemi K, Hosokawa T, Miyazaki M. Intrathoracic migration of an epidural catheter. J Anesthesia 1991;5:100-2.

(4) Grieve PP, Whitta RK. Pleural puncture : An unusual complication of thoracic epidural. Anaesth Intensive Care 2004;32:113-6.

(5) Miura K, Tomiyasu S, Cho S, Sakai T, Sumikawa K. Pneumothorax associated with epidural anesthesia. J Anesth 2004;18:138-40.

(6) Eti Z, Lacin T, Yildizeli B, Dogan V, Gogus FY, Yuksel M. An uncommon complication of thoracic epidural anesthesia : pleural puncture. Anesth Analg 2005 May;100(5):1540-1.

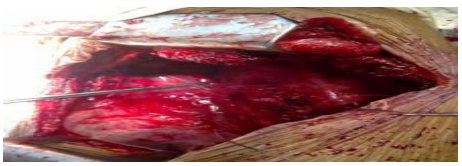
(7) Patermann B, Lynch J, Schneider P, Weigand C, Kampe S. Intrathoracic positioning of a thoracic epidural catheter inserted via the median approach. Can J Anaesth. 2005;52:443-4.

(8) Michael A.Cordone, Christopher L, Aimee L.Maceda, Jeffrey M.Richman. Unrecognised contralateral intrapleural catheter : Bilateral blockade may obscure detection of failed epidural catheterisation. Anesth Analg 2007;104:735-7.

(9) Tetik O, Islamoglu F, Ayan E, Duran M. Intermittent infusion of 0.25% bupivacaine through an intrapleural catheter for post-thoracotomy pain relief. Ann Thorac Surg 2004;77:284-288.

(10) Me Ilvaine WB. Pro : Intrapleural anaesthesia is useful for thoracic analgesia. J Cardiothoracic Vasc Anesth 1996;10:425-8.

11)Elman A, Debaene B, Magny, Metrot C, Murciano G. Interpleural analgesia with bupivacaine following thoracotomy ; ineffective results of a controlled study and pharmacokinetics. J Clin Anesth 1993;5:118-21



pleural puncture following thoracic epidural