

Transversus Abdominis Plane (TAP) Block for Postoperative Analgesia in Acute Pulmonary Oedema Following Caesarean Section- A Case Report

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Abstract

A thirty six years old woman admitted in ICU following emergency lower uterine caesarean section under subarachnoid block (SAB). After 03 hours of surgical procedure, the patient develops severe respiratory distress. Patient was evaluated and diagnosed as a case of acute pulmonary oedema. In ICU, she was aggressively treated with intravenous Morphine, frusemide and parenteral antibiotic. After 1 hour of intensive care management, respiratory distress decreased but not significantly, in addition, she complains of severe pain on surgical operative site. Post operative analgesia was maintained with parectamol (500 mg) suppositories six hourly and intramuscular pathedine 75 mg 8 hourly. Instead of this her pain scores were 7/10 at rest and 8/10 on coughing along with respiratory distress. Then in ICU under all aseptic precaution bilateral TAP block was performed using landmark technique with 0.25% plain bupivacine 20 ml. Thirty minutes later, her pain subsided significantly and pain score became 1/10 at rest and 2/10 on coughing. Thereafter patient was slept for 4 hours, pain free and could take care of herself. After 48 hours patient was shifted to ward and discharged on 7th post operative day. TAP block is relatively easy, safe techniques. Because of simplicity and low cost, TAP block is likely to be an effective adjunct to multimodal postoperative analgesia for abdominal surgery.

Key-words: Caesarean section, Subarachnoid block, Acute pulmonary oedema, Transverses abdominis plane block.

Introduction

Choices of postoperative analgesic in a patient with severe respiratory distress present a unique set of challenges to the anaesthesiologists during perioperative period. Provision for effective post-operative

analgesia is essential to relief pain and to facilitate effective cough and chest physiotherapy. Use of opioids for postoperative analgesia in patients with severe respiratory distress is controversial due to their respiratory depressive effect on central nervous system. Non-steroidal anti-inflammatory drugs (NSAIDs) are also contraindicated in those patients as these drugs block the synthesis of bronchodilator group of leukotrienes. Transversus-abdominis plane block is a promising new regional anaesthetic technique with a potential for wide range of application¹⁻⁴. Recent randomized trials have demonstrated the efficacy of transversus abdominis plane block in providing postoperative analgesia after abdominal surgery¹. This case report demonstrated the effectiveness of TAP block as postoperative analgesic technique in a patient with postoperative acute pulmonary oedema after caesarean section under subarachnoid block.

Case Report

Thirty six years old women admitted in ICU following emergency lower uterine caesarean section under subarachnoid block. On admission at ICU patient was haemodynamically stable with mild cough and respiratory distress, maintaining SpO₂ 95% with oxygen. After 03 hr of surgical procedure patient develops severe respiratory distress. She underwent emergency caesarean section with history of cough and IHD but she was on regular medication. Postoperatively cardiovascular examination revealed tachycardia (136 beat per minute) and non-invasive arterial blood pressure 130/60 mm Hg. She was tachypnoic with respiratory rate 38 per min and maintaining SpO₂ 85±2% on room air. Patient was evaluated and diagnosed as a case of postoperative acute pulmonary oedema.

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We could not perform arterial blood gases of the patient due to non availability of laboratory support. In ICU, she was aggressively treated with intravenous morphine, frusemide, and parenteral antibiotic. After 1 hour of intensive care management respiratory distress decreased but not significantly, In addition, she complains of severe pain on surgical operative site. Post operatively analgesia was maintained with parectamol 500 mg suppositories six hourly and intramuscular pathedine 75 mg 8 hourly. Post operative pain was assessed by the use of verbal rating on a visual analogue scale (VAS) of 0 to 10. Patient had initial pain scores of 7/10 at rest and 8/10 on coughing along with respiratory distress. She was finding it difficult to cough. After a dose of rescue analgesic with fentanyl 50 microgram intravenously, her pain score reduced to 4/10 at rest and 6/10 on coughing, but not enough to be able to cough effectively. In addition, she also received 3 mg morphine intravenously for acute pulmonary oedema. Then in ICU under all aseptic precautions bilateral TAP block was performed using landmark technique with 0.25% plain bupivacine 20 ml. Thirty minutes later, her pain subsided significantly and pain score became 1/10 at rest and 2/10 on coughing. She was able to cough effectively and allowed her to undergo chest physiotherapy. Thereafter patient was slept for 4 hours, pain free and could take care of herself. After 48 hours patient was shifted to ward and discharged on 7th postoperative day.

Discussion

Effective analgesia has been shown to reduce the postoperative stress response and accelerate recovery from surgery⁵. There has been an increasing need to find effective analgesic techniques that have lower risks. The use of sensory block of the anterior abdominal wall with local anaesthetic for postoperative analgesia is an attractive option, because of its simplicity, safety and low cost. The TAP block is a new regional anaesthetic technique that blocks the abdominal neural afferents by introducing local anaesthetic into the neurofascial plane between the internal oblique and the transversusabdominis muscles. The technique described based on the so called Petit triangle. The borders of "Petit" triangle formed of latissimusdorsi muscle posteriorly, external oblique muscle anteriorly and iliac crest forming the base.

McDonnell et al described the block using these landmark technique⁶. Hebbard et al subsequently described an ultrasound-guided technique for the TAP block with low complication rate⁷.

In this case, patient has already received 3 mg Morphine and 50 microgram fentanyl, but patient still complain of severe postoperative pain with respiratory distress. Usually opioid-based analgesic regimens can provide satisfactory analgesia, but in large doses may be associated with adverse effects including sedation, respiratory depression needing to control ventilation in a case of acute pulmonary oedema. The gold standard for providing analgesia would have been an epidural analgesia but non feasibility of epidural procedure in ICU precluded its placement. Although epidural techniques can provide excellent analgesia but rare complications (epidural hematoma and abscess) are potentially catastrophic⁸. Non-steroidal anti-inflammatory drugs are relatively contraindicated in our patient. Our patient had a high risk for early postoperative respiratory failure resulting from basal atelectasis caused by pain and inability to clear secretions on a background of acute pulmonary oedema. Moreover this patient has already received significant dose of opioid (morphine and fentanyl); further dose of opioid for postoperative analgesia will require mechanical ventilation, thus TAP block performed to avoid further dose of opioid in turn avoided mechanical ventilation.

Recently efficacy of transversusabdominis plane block in postoperative analgesia after abdominal surgery has been published in different literature¹⁻⁴. TAP blocks eliminate somatic pain relating to the surgical incision but do not treat visceral pain. However in this patient, TAP block has provided analgesia for 14 hours postoperatively. This prolonged effect of TAP block may be due poor vascularization of transversus abdominis plane.

In this patient, pain was not relieved adequately with a rescue dose of morphine and fentanyl, moreover she was in severe respiratory distress due to pulmonary oedema. Young age with respiratory distress may be the reason to make her intolerance to pain. After the placement of TAP block in the ICU,

her pain relived significantly and could cough effectively. Singh et al. demonstrated that bilateral TAP blocks in addition to noninvasive positive pressure ventilation was effective in the management of a 74 years old patient with impending respiratory failure resulting from excessive pain and narcosis following emergency laparotomy⁹. Similarly effectiveness of TAP block as rescue analgesic has been shown by Niraj G et al. and Petersen PL et al^{10,11}. The duration of opioid sparing effect after a single shot injection into the transversus abdominis plane has been reported to range from 24 to 36 hours^{12,13}. These features of the TAP block may have aided the recovery of patients after emergency surgery. In theory, analgesic effect may be due to systemic absorption of local anaesthetic in addition to blockade of nerves in transversus abdominis plane¹⁴. General risks of regional anaesthesia like inadvertent intravascular injection, local anaesthetic toxicity, infection, and poor/failed block are also applicable to TAP block. Complications of TAP block techniques are rare. Use of ultrasound-guided technique as in other regional technique will increase its safety profile. This case report demonstrates the utility and safety of transversus abdominis plane (TAP) block in postoperative analgesia in a patient with postoperative acute pulmonary edema after caesarean section under subarachnoid block.

Conclusion

In the new millennium, the horizons of modern anesthesia practice continue to expand beyond the provision of surgical anesthesia to encompass areas outside the operating room, including post-anaesthesia care, critical care and pain management. Neuroaxial analgesia has been the standard alternative to parenteral opioid use in postoperative analgesia. But in developing country like Bangladesh, skill nursing stuffs are not adequate to supervise these patients. TAP block provides prolong abdominal wall analgesia and thus avoids opioid related side effects. This is especially beneficial in patients that are particularly sensitive to the respiratory depressant effects of opioid. TAP block is relatively easy, safe techniques requiring less nursing supervision for prolonged period of time. Because of simplicity, safety and low cost TAP block is likely to be an effective adjunct to multimodal postoperative analgesia for abdominal surgery.

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