Continuous Transversus Abdominis Plane (TAP) Block and Intraoperative Coeliac Plexus Block (CPB) for Post-Operative Analgesia Following Laparotomy: Two Case Reports

Vasanth Rao Kadam,1,* and George Kiroff2

1Clinical Senior Lecturer, The University of Adelaide, Acute Care Medicine, The Queen Elizabeth Hospital, 28 Woodville Road, Woodville, SA, 5011. Australia
2Division of Surgery, Hepatobiliary Unit, Associate Professor, The University of Adelaide, The Queen Elizabeth Hospital, 28 Woodville Road, Woodville, SA, 5011. Australia

*Corresponding author: Vasanth Rao Kadam, The Queen Elizabeth Hospital, 28 Woodville Road, Woodville, SA, 5011. Australia. Tel: +61-882226000, Fax: +61-882227065, E-mail: Vasanth.rao@health.sa.gov.au

Received 2016 October 16; Revised 2016 November 24; Accepted 2016 December 23.

Keywords: Transversus Abdominis Plane Block, Coeliac Plexus Block, Post-Operative Analgesia

1. Introduction

The celiac plexus block (CPB) is used for motility disorders and chronic pain (1). As it covers visceral pain blocking afferents from the viscera, this block is considered effective and used extensively in cancer pain (2). Particularly in pancreatic cancer pain, CPB is done percutaneously under fluoroscopy, ultrasound or endoscope guidance and also laparoscopically (3-5). But its role is limited in acute postoperative pain management. Though it was used for anaesthesia for laparotomy in 1927, there are limited studies on its use in the intraoperative period for acute postoperative pain management (6-8). When there are no appropriate randomized trials, case reports can be useful to provide a greater insight into interventions to practice evidence-based medicine (9). Transversus abdominis plane (TAP) block has been used as postoperative analgesic technique for somatic pain relief in both upper and lower abdominal surgery (10, 11). To obtain relief from both somatic and visceral pains, there are no reports of combined local anaesthetic (LA) infiltration at Celiac Plexus and continuous TAP block for post-operative analgesia. Therefore, we report its use in two cases.

2. Case Report

A 62-year-old female patient weighing 81 kg presented for gastric bypass. Her co-morbidities were hypertension, type 2 diabetes mellitus, obesity, depression, and many previous uneventful abdominal surgeries. She had spinal injuries resulting in chronic back pain and receiving Pregabalin 75mg BD. For post-operative pain management, she was reluctant to have an epidural although she consented for the TAP block catheters with CPB and Fentanyl (Fentanyl citrate AstraZeneca Pty Ltd NSW Australia) patient-controlled analgesia (PCA). A GA was given with Propofol (Fresofol, Fresenius Kabi, Australia) and Remifentanil (Ultiva, Glaxo SmithKline Australia Pty Ltd. Vic. Australia). Anaesthesia was maintained with Propofol and Remifentanil TCI infusions, O2, air, and Rocuronium. Before closure of abdomen, under direct vision, the surgeon identified and performed the CPB using a 22-gauge spinal needle. At the left crux of the diaphragm, 2 mL Ropivacaine 0.75% (Naropin, AstraZeneca Pty Ltd NSW Australia) was injected followed by 3ml injection at the right crux (Figure 1). There was 15 mmHg fall in blood pressure which did not require any vasopressor.

Ultrasound guided bilateral subcostal TAP was performed postoperatively using an 18 g Touy’s needle followed by catheter insertion. A 20 mL bolus of 0.5% ropivacaine was injected into each side. This was followed by 0.2% ropivacaine infusion at 8ml/hour each side for 48 hours. In
the recovery room, the patient did not require any analgesia. However, 8 hours later, she started experiencing sharp pain requiring fentanyl 20mcg bolus and using 700 mcg on day 1 and 680 mcg on day 2. Her dynamic pain scores were 2/10 and 5/10 on day 1 and 2, respectively. Other administered analgesia was Paracetamol 1 gm 6hourly and Pregabalin for the back pain.

The second patient was a 90-year-old man with similar co-morbidities for Whipple’s procedure; he also did not show eagerness for epidural and he had similar GA as mentioned above; but for CPB, 15 mL ropivacaine 0.75% was administered. Post CPB, the patient had 20 mmhg fall in blood pressure although it was uneventful. He had neither dull pain from the viscera nor sharp pain from the incision for 12 hours. His dynamic pain scores were 5/10 on day one and two.

A combination of CPB and TAP block resulted in pain relief for the first 8 to 12 hours negating the use of opioids. This short-term complete pain relief could be due to the local anaesthetic blocking the pain arising from the visceral and somatic at the abdominal wall level. The advantage of CPB is that it is easier to visualise and could be easily performed by the surgeons. The main disadvantages may be hypotension/diarrhoea and inability to visualise the retroperitoneal LA spread. Care must be taken as a case of paraplegia has been reported in an intraoperative CPB (12). The short duration of action was limited by the reduced dosage in the first patient. A continuous CPB could have prolonged the duration of analgesia as demonstrated in one study (8). When conventional options of analgesics are contraindicated, then the combination of CPB and TAP may be useful for post-operative analgesia for laparotomy.

3. Conclusion

The combination of CPB and continuous TAP block improved analgesia and reduced the need for opioids. More studies are needed to evaluate the combination of continuous CPB and TAP infusion in post-operative pain management.

Footnote
Financial Disclosure: None declared.

References
1. Carachi R, Currie J, Steven M. New tools in the treatment of motility disorders in children. Semin Pediatr Surg. 2009;18(4):274–7. doi: 10.1053/j.sempedsurg.2009.07.009. [PubMed: 19782310].
2. Prithvi R. Pain medicine a comprehensive review. In: Prithvi R, Patt P, editors. Visceral pain. 2nd ed. Mosby: St Louis Missouri; 2003. pp. 104–5.
3. Wong KY, Schroeder DR, Carns PE, Wilson J, Martin DP, Kinney MO, et al. Effect of neurolytic celiac plexus block on pain relief, quality of life, and survival in patients with unresectable pancreatic cancer: a randomized controlled trial. JAMA. 2004;291(9):1092–9. doi: 10.1001/jama.291.9.1092. [PubMed: 14996778].
4. Seicean A. Celiac plexus neurolysis in pancreatic cancer: the endoscopic ultrasound approach. World J Gastrointest Endosc. 2014;20(3):210–7. doi: 10.3748/wjg.v20.i3.110. [PubMed: 24445863].
5. Allen PJ, Chou J, Janakos M, Strong VE, Coit DG, Brennan MF. Prospective evaluation of laparoscopic celiac plexus block in patients with unresectable pancreatic adenocarcinoma. Ann Surg Oncol. 2011;18(3):636–41. doi: 10.1245/s10434-010-1372-x. [PubMed: 20953910].
6. Takats G. Splanchnic anesthesia: A critical review of the theory and practice of this method. Surg Gynecol Obstet. 1927;44(1):501.
7. Gardner AM, Solomou G. Relief of the pain of unresectable carcinoma of pancreas by chemical splanchnicectomy during laparotomy. Ann R Coll Surg Engl. 1984;66(6):409–11. [PubMed: 6200013].
8. Hamid SK, Scott NB, Sutcliffe NP, Tighge SQ, Anderson R, Cruikshank AM, et al. Continuous coeliac plexus blockade plus intermittent wound infiltration with bupivacaine following upper abdominal surgery: a double-blind randomised study. Acta Anaesthesiol Scand. 1992;36(6):534–9. [PubMed: 1514338].
9. Imani F, Rahimzadeh P. Interventional pain management according to evidence-based medicine. Anesth Pain Med. 2012;2(4):235–6. doi: 10.5822/apam.454. [PubMed: 24004805].
10. Taylor RJ, Pergolizzi JV, Sinclair A, Raffa RB, Aldington D, Plavin S, et al. Transversus abdominis block: clinical uses, side effects, and future perspectives. Pain Pract. 2013;13(4):332–44. doi: 10.1111/j.1533-2506.2012.00595.x. [PubMed: 22967210].
11. Gharaei H, Imani F, Almasi F, Solimani M. The Effect of Ultrasound-guided TAPB on Pain Management after Total Abdominal Hysterectomy. Korean J Pain. 2013;26(4):374–8. doi: 10.3344/kjp.2013.26.4.374. [PubMed: 24156004].
12. Hayakawa J, Kobayashi O, Murayama H. Paraplegia after intraoperative celiac plexus block. Anaesth Analg Case Report. 1997;84(2):447–8.