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Case Report

Anaesthesia Section

Ultrasound-guided Transversus Abdominis Plane Block as Rescue Analgesia following Failed Spinal Anaesthesia in a High Risk Patient: A Case Report

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ABSTRACT

Opioid-free perioperative analgesia plays a crucial role in patients with significant co-morbidities and a prior history of opioid-related respiratory depression. Achieving adequate analgesia using regional anaesthesia techniques is of importance in such cases. The present case report details the anaesthetic management of a 58-year-old male with a history of obesity, Obstructive Sleep Apnoea (OSA), stage 4 Chronic Kidney Disease (CKD), hypertension and opioid-induced respiratory depression who was scheduled to have a laparoscopic hernia repair. Spinal anaesthesia was chosen as the anaesthetic modality to avoid opioid usage. Inadequate neuraxial blockade necessitated General Anaesthesia (GA). The goal of an opioid-free anaesthetic technique was accomplished by using dexmedetomidine infusion and an ultrasound-guided bilateral Transversus Abdominis Plane Block (TAPB) for perioperative analgesia. The patient remained haemodynamically stable throughout the surgery without requiring vasopressors or opioids. Pain scores remained low in the recovery room with analgesia provided by paracetamol. There were no episodes of respiratory depression, sedation, nausea, or vomiting. The present case evidences the efficiency of ultrasound-guided TAPB plus dexmedetomidine as a safe opioid-sparing strategy after failed Neuraxial Anaesthesia (NA) in high risk patients undergoing laparoscopic abdominal surgery.

Keywords: Dexmedetomidine, Fascial plane technique, Neuraxial failure, Opioid avoidance, Perioperative pain management

CASE REPORT

A 58-year-old male, weighing 92 kg and 163 cm tall {Body Mass Index (BMI)=34.6 kg/m^2}, was scheduled for laparoscopic incisional hernia repair. He was classified as the American Society of Anaesthesiologists' (ASA) Physical Status III due to multiple systemic co-morbidities. He had OSA for six years, compliant with continuous positive airway pressure every night. He was a known hypertensive, on amlodipine 5 mg and telmisartan 40 mg daily for eight years. He had stage 4 CKD for four years, with a baseline creatinine of 3.2 mg/dL and an estimated glomerular filtration rate of about 22 mL/min/1.73 m^2. He had a documented history of significant postoperative respiratory depression after receiving opioids following a laparoscopic cholecystectomy three years ago, which resulted in him requiring prolonged oxygen supplementation after surgery.

An airway examination before surgery showed the patient had a Mallampati Class III airway, a short neck and limited neck extension. The patient's baseline vitals were: Heart Rate (HR) 84 bpm; Blood Pressure (BP) 148/86 mmHg; and oxygen saturation (SpO_2) on room air 96%. The first haemoglobin level was 10.4 g/dL and the platelet count was 2.4×10^5/mm^3. The laboratory reported the serum electrolytes to be within normal limits and the coagulation profile was normal. The electrocardiogram showed a regular sinus rhythm. The echocardiogram recorded that there was good left ventricular systolic function with a preserved ejection fraction of 60%. Preoperative optimisation was planned in collaboration with the nephrology team. Telmisartan was discontinued on the day of surgery. Appropriate fluids were given and fluid overload was avoided. Nephrotoxic drugs were not used. Since the patient's situation increased the anaesthetic risk and opioids had to be avoided, spinal anaesthesia was chosen.

The ASA-standard intraoperative monitoring was established in the operating room. Baseline intraoperative HR (82 bpm), BP (146/84 mmHg) and SpO_2 (98%) were noted. Spinal anaesthesia was performed in the sitting position at the L3-L4 interspace with a 25-G Quincke needle under strict aseptic conditions using 16 mg of 0.5% hyperbaric bupivacaine and 25 mcg of fentanyl. The procedure was technically challenging, due to patient factors including obesity, poorly palpable landmarks and limited spinal flexion. Three attempts were made using the midline approach. However, no free flow of cerebrospinal fluid was obtained. A paramedian approach was subsequently adopted, with successful dural puncture achieved on the first attempt. A sensory block restricted only to the L1 dermatome was demonstrated 15 minutes after the patient was brought into the operating room. Because segmental blockade was inadequate, GA was administered.

Glycopyrrolate (0.2 mg) intravenously and titrated doses of propofol (120 mg) were given to induce GA. Atracurium (45 mg) was used for muscle relaxation and intubation was performed easily with a video laryngoscope. To abolish the stress response to GA and to complete the whole procedure without opioids, intravenous dexmedetomidine was given 0.5 mcg/kg over 10 minutes before GA induction, followed by continuous maintenance infusion 0.3 mcg/kg/h for the duration of the operative procedure.

Anaesthesia was maintained using sevoflurane at 1.2 Minimum Alveolar Concentration (MAC) in a mixture of oxygen and air, with controlled ventilation to maintain end-tidal carbon dioxide between 35 mmHg and 40 mmHg. No opioids were administered during the operative procedure.

After inducing anaesthesia, an ultrasound-guided bilateral TAPB was performed for perioperative pain control. In the supine position, a high-frequency linear ultrasound probe was placed on the mid-axillary line between the costal margin and the iliac crest. The external oblique, internal oblique and transversus abdominis layers of muscle were identified and a 22-G block needle was advanced in-plane. Once negative aspiration was accomplished, 20 mL of

0.25% ropivacaine was injected on either side into the fascial plane between the internal oblique and transversus abdominis muscles and good hydrodissection was visualised.

Intraoperatively, the patient remained haemodynamically stable, with a HR between 74 and 88 bpm and a mean arterial pressure between 75 and 85 mmHg, without vasopressor support. The total surgical time was about 110 minutes, with an estimated blood loss of 150 mL and a total crystalloid volume of 800 mL. The patient's neuromuscular blockade was reversed at the conclusion of surgery with neostigmine (2.5 mg) and glycopyrrolate (0.4 mg) and the patient was extubated awake after it was established that spontaneous ventilation was adequate and airway reflexes were intact.

Postoperatively, the patient was placed in the post-anaesthesia care unit under continuous monitoring. Pain scores measured on a numeric rating scale were low at rest (2 out of 10) and on movement (3 out of 10) during the first six hours after surgery. Pain was managed with 1 gram of intravenous paracetamol every eight hours and no other analgesics were required during the first 24 hours after surgery. Postoperatively, the patient maintained adequate urine output (approximately 55-70 mL/h) with no evidence of oliguria or fluid overload. Serum creatinine remained stable (postoperative 3.3 mg/dL at 24 hours) and blood urea levels showed no significant rise. Serum potassium was maintained within normal limits (4.6 mEq/L) and no metabolic derangements were observed. Haemodynamic stability was preserved throughout the postoperative period, ensuring adequate renal perfusion. Total perioperative fluid balance was carefully maintained, with no clinical signs of volume overload or deficit. The patient did not experience hypoventilation, sedation, nausea, or vomiting. The patient walked on the first day after surgery and was discharged without complications on the fifth postoperative day. At follow-up at one week and one month, the patient remained clinically stable with no evidence of renal deterioration or surgical complications.

DISCUSSION

Providing opioid-free, effective perioperative analgesia in abdominal surgery using a dependable technique can be a challenge for healthcare professionals. When patients develop complications with NA, anaesthetic techniques should be changed immediately to maintain haemodynamic stability and patient safety and to ensure adequate postoperative analgesia. Failure of NA is a clinical complication that has long been recognised and documented and there are many reasons for it. Some include the difficulty in accessing the neuraxial space, anatomic abnormalities of the spine, obesity and the unpredictable spread of local anaesthetics into the intrathecal space. In most cases, the patient has to be put under GA. Switching to GA after failed NA attempts is one of the major issues in such cases because it can cause severe intraoperative and postoperative pain that has to be managed by the administration of systemic opioids. In patients suffering from significant OSA, CKD and past episodes of opioid-related respiratory depression, the administration of opioids may result in respiratory depression, prolonged sedation and protracted recovery. Healthcare providers need to implement alternative methods of analgesia following NA failure [1,2].

The TAPB provides pain control in the anterior abdominal area by blocking the thoracolumbar nerves that supply the skin, muscles and parietal peritoneum. This method allows for more accurate placement of the local anaesthetic drug into the correct fascial plane, enabling greater reliability and safety when used with patients who have an increased BMI, have undergone surgical intervention, or have been compromised by a chronic condition [3,4]. In this case, a bilateral ultrasound-guided TAPB was utilised after failed traditional NA. The success of the TAPB approach was supported by minimal pain scores and necessary rescue analgesia for patients following their procedure. Similar conclusions were made by Singh S et al., who showed that a laparoscopic-assisted TAPB performed during laparoscopic ventral hernia repair resulted in lower postoperative pain scores, less requirement for rescue analgesia and shorter length of stay as compared to local anaesthetic infiltration at the port sites. These results are very similar to those reported in this case, where postoperative analgesia allowed for early mobility and an uneventful postoperative period [5].

Further evidence for the analgesic efficacy of TAPB is provided by Rakhecha M et al., who found reduced postoperative pain scores and opioid use for patients receiving a TAPB compared to controls, especially early after laparoscopic ventral hernia repair, earlier ambulation and discharge [6]. Mughal A et al., showed significant pain score reductions at three and six hours after surgery, decreased need for rescue analgesics and higher patient satisfaction among those receiving a laparoscopic-assisted TAP block in total extraperitoneal inguinal hernia repair [7]. The current case supports these findings by demonstrating optimal early postoperative pain control and no need for supplemental opioids, thereby confirming the ability of TAPB to provide effective early analgesia for different surgical procedures. Hubbard G et al., provided further support for the use of TAPB in laparoscopic hernia repair by demonstrating improved postoperative pain control, increased mobility and decreased opioid requirements, making it an effective component of a multimodal analgesia approach [8]. The current case also demonstrates that TAPB assisted with stable postoperative recovery, early mobilisation and no adverse effects from opioids.

The addition of dexmedetomidine infusion to the current patient provided further benefit by decreasing the perioperative stress response, maintaining haemodynamic stability and enabling an opioid-sparing anaesthetic without causing respiratory depression, which can be particularly helpful in patients with OSA and a history of opioid sensitivity [9,10]. The presence of OSA and CKD can create many different challenges for the anaesthesiologist. Some of these challenges are increased sensitivity to sedatives, increased risk of postoperative respiratory depression, altered pharmacokinetics of anaesthetic agents and the need for precise management of fluids in order to maintain renal function [11,12].

To prevent renal failure, nephrotoxic agents should be avoided; haemodynamics should be kept stable; and fluid volume must be precisely titrated. Each of these factors is important in avoiding further damage to the kidneys. In this case, the anaesthesiologist was able to successfully address these issues by using organ-independent anaesthetics, avoiding the use of opioid and non opioid non steroidal anti-inflammatory medications and incorporating regional anaesthetic techniques such as TAPB, which do not create additional metabolic load on the kidneys [12,13].

Consideration of alternative anaesthetic techniques such as epidural anaesthesia, ketamine-based analgesia, or systemic non opioid analgesics was not appropriate for this patient. Epidural anaesthesia poses a technical challenge and risk of haemodynamic instability in obese individuals. Ketamine and systemic non opioid analgesics may have undesirable side effects or limited efficacy as the only analgesics. Thus, the choice to provide GA combined with continuous dexmedetomidine infusion and bilateral TAPB was made as the most appropriate balanced technique for this patient based upon the co-morbid conditions and the clinical circumstances surrounding the procedure [14,15].

CONCLUSION(S)

The selection of regional anaesthesia techniques for patients at high risk of adverse outcomes following GA presents a serious perioperative risk to the anaesthetist. Spinal anaesthesia can fail to achieve adequate analgesia, particularly in patients with significant co-morbidities. The current case reflects the use of ultrasound-guided TAPB as an alternative analgesic method after

failed spinal anaesthesia, as well as the ability to achieve reliable somatic analgesia without the use of opioids, thereby enabling an opioid-free perioperative management strategy. When using TAPB in conjunction with the appropriate administration of adjuncts, such as dexmedetomidine, TAPB provides an anaesthetist with a quality tool for achieving, maintaining and providing for adequate haemodynamic stability, adequate control of pain and decreased use of opioids.

REFERENCES

[1] Demilie AE, Denu ZA, Bizuneh YB, et al. Incidence and factors associated with failed spinal anaesthesia among patients undergoing surgery: A multi-center prospective observational study. BMC Anaesthesiol. 2024;24(1):129.
[2] Brown EN, Pavone KJ, Naranjo M. Multimodal general anesthesia: Theory and practice. Anesth Analg. 2018;127(5):1246-58.
[3] Bonnet F, Berger J, Aveline C. Transversus abdominis plane block: What is its role in postoperative analgesia? Br J Anaesth. 2009;103(4):468-70.
[4] Dwivedi D, Bhatnagar V, Goje H, Ray A, Kumar P. Transversus abdominis plane block: A multimodal analgesia technique – Our experience. J Mar Med Soc. 2017;19(1):38.
[5] Singh S, Agrawal H, Gupta N, Agarwal N, Kumar A, Kumar S. Comparing laparoscopic transversus abdominis plane block and port-site infiltration in laparoscopic ventral hernia repair: A randomised controlled trial. J Minim Access Surg. 2025.
[6] Rakhecha M, Gupta P, Babal R, Arora C. Laparoscopic-guided transversus abdominis plane block for better postoperative pain relief in laparoscopic ventral hernia repair: An observational study. Cureus. 2025;17(10):e94896.
[7] Mughal A, Khan A, Rehman J, Naseem H, Waldron R, Duggan M, et al. Laparoscopic-assisted transversus abdominis plane block as an effective analgesic in total extraperitoneal inguinal hernia repair: A double-blind, randomized controlled trial. Hernia. 2018;22(5):821-26.
[8] Hubbard G, Hubert C, Vudayagiri L, Tullington J, Merino K, Vaidya A, et al. Transversus abdominis plane blocks in laparoscopic inguinal hernia repair: A review. Hernia. 2023;27(5):1059-65.
[9] Benyamin R, Trescot AM, Datta S, Buenaventura R, Adlaka R, Sehgal N, et al. Opioid complications and side-effects. Pain Physician. 2008;11(2):S105-S120.
[10] Afonso J, Reis F. Dexmedetomidine: Current role in anaesthesia and intensive care. Braz J Anaesthesiol. 2012;62(1):118-33.
[11] Abbasi A, Gupta SS, Sabharwal N, Meghrajani V, Sharma S, Kamholz S, et al. A comprehensive review of obstructive sleep apnea. Sleep Sci. 2021;14(2):142-54.
[12] Chowdhury SR, McLure HA. Chronic kidney disease and anaesthesia. BJA Educ. 2022;22(8):321-28.
[13] Rath P, Shivashankar A, Luthra L, Mitta N. Regional anaesthesia: Boon for chronic kidney disease patients undergoing vascular access surgery. Intt J Rec Surg Med Sci. 2019;5(02):37-41.
[14] Elsharkawy H, Sonny A, Chin K. Localization of epidural space: A review of available technologies. J Anaesthesiol Clin Pharmacol. 2017;33(1):16-27.
[15] Abdollahpour A, Saffarieh E, Zoroufchi B. A review on the recent application of ketamine in management of anaesthesia, pain, and health care. J Family Med Prim Care. 2020;9(3):1317-24.

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