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Journal of Society of Anesthesiologists of Nepal



## Case reports

### Ultrasound guided abdominal plane blocks as anaesthetic technique for laparotomy in cancer patients: a case series

**Anuj Jung Rayamajhi, Prajwal Raj Bhattarai, Rupesh Kumar Yadav, Subash Chandra Paudel, Rabin Pandit, Vikal Chandra Shakya**

**Civil Service Hospital, Min Bhawan, Kathmandu 44600, Nepal**

#### ARTICLE INFO

##### Article History

Received 10.08.2016

Accepted 26.08.2016

Published 17.09.2016

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#### Abstract

Diagnosis and surgery pertaining cancer are increasing day by day in the developing world. Delay in diagnosis, poor socioeconomic status, and poor medical facilities are the challenge in treating these patients. Decreasing or preventing postoperative morbidity is of paramount importance in these cases. Ultrasound guided abdominal plane blocks like transversus abdominis plane block, rectus sheath block and coeliac plexus in combination with ketofol and/or dexmedetomidine sedation may be the alternative to general anaesthesia with an endotracheal tube or neuraxial block. These techniques, successfully used in our patients undergoing cancer surgeries, have a potential to decrease intensive care length of stay, decrease requirement of mechanical ventilation, early ambulation, and discharge.

**Keywords:** anaesthesia; gastrointestinal neoplasm; nerve blocks; oncology; surgery



**How to cite this article:** Rayamajhi AJ, Bhattarai PR, Yadav RK, Paudel SC, Pandit R, Shakya VC. Ultrasound guided abdominal plane blocks as anaesthetic technique for laparotomy in cancer patients: a case series. Journal of Society of Anesthesiologists of Nepal (JSAN) 2016;3(2):90-92. <http://dx.doi.org/10.3126/jsan.v3i2.15625>

#### Introduction

The number of patient undergoing abdominal surgeries for gastrointestinal tumour, associated with or without altered pathophysiology is increasing in our regions resulting in high incidence of postoperative morbidity and mortality. Decreased pulmonary and cardiac reserves, high use of opioids and inhalation agents may aggravate postoperative complications like pneumonia, ARDS, cardiac failure, renal failure and cognitive dysfunction.

Classical technique of general anaesthesia and neuraxial block provide effective anaesthesia and analgesia at the cost of hemodynamic instability and postoperative pulmonary complications.<sup>1</sup> Modified techniques of delivering anaesthesia, abdominal plane blocks have shown to be an effective and safe method for laparotomy in resourceful settings.<sup>2</sup> Hence combining local anaesthetic with intravenous sedation could be an excellent choice in

Corresponding Author: Dr. Anuj Jung Rayamajhi, MD

Head, Department of Anaesthesia and Critical Care,

Civil Service Hospital, Min Bhawan, Kathmandu 44600, Nepal, Email: [anujrayamajhi@gmail.com](mailto:anujrayamajhi@gmail.com)

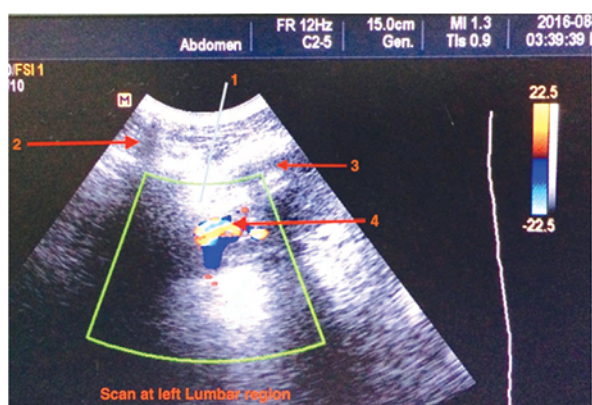
the case of geriatric population and cancer patients with co-morbid conditions in a resource-limited setting like ours.

Ultrasound guided deposition of local anaesthetic in various abdominal planes like (transversus abdominis plane) TAP block, rectus sheath block, quadratus lumborum (QL) block in combination with coeliac plexus at T12 or L1 vertebral level can provide adequate anaesthesia and analgesia for laparotomy. Neuraxial and general anaesthesia with endotracheal intubation can be avoided.

We report series of major onco-surgeries performed under the various abdominal plane blocks including coeliac plexus block.

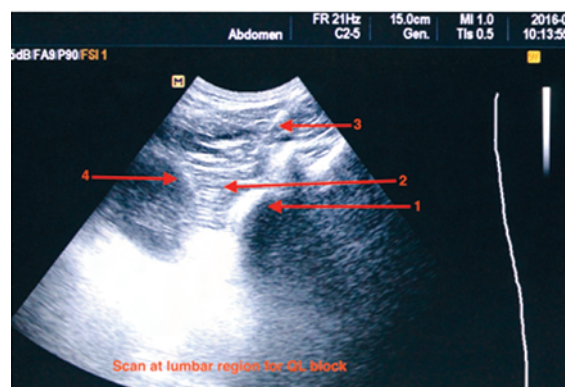
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In all the cases, standard monitoring techniques, arterial pressure monitoring and central venous catheter were used. Pre-procedural ketorolac 60 mg IV, midazolam 2 mg IV and fentanyl 50-75 micrograms were given to all the patients. Oxygen was delivered via face mask at 5-6 litres/min. Aseptic precaution was maintained and real-time imaging was used for each procedure. In-plane techniques were used for abdominal plane blocks using 5-12 frequency linear probe and out-of-plane for coeliac plexus block using 2-5 frequency convex probe. Twenty-five Gauge Quincke spinal needles were used for all blocks and normal saline was used for hydro dissection for plane confirmation. Coeliac plexus block was performed at T12 or L1 vertebral level. Figure 1 is a guide for location of Coeliac plexus. A nasal airway was inserted after initiation of sedation. Total procedural time for placement of blocks, QL catheters, a central venous line and the arterial line was around 45 minutes in all the three cases.



**Figure 1: Scan at the left lumbar region for Coeliac plexus block**

Direction of the needle 2. Spinous process 3. Left Kidney 4. Renal vessels



**Figure 2: Ultrasound image of needle insertion for Quadratus lumborum catheter placement**

1.Body of lumbar vertebra 2. Psoas muscle 3. Shadow of the needle 4. Right kidney

### Case 1

Fifty-five years old female, diagnosed case of Carcinoma head of pancreas was planned for Whipple procedure.

A mixture of fifty ml of 1% lignocaine with adrenaline and 0.33% ropivacaine was used in divided dose for Rectus sheath and TAP block on both sides and 10 ml of 1% lignocaine with adrenaline used for coeliac plexus. Similarly, Quadratus lumborum (QL) catheters were placed on either side under sonological guidance.

Ketofol infusion (Mixture of Ketamine: Propofol 1:4) was started @ 3.5-6.5 ml/hour just before painting and draping and was continued throughout surgery. Fentanyl 50 micrograms and propofol 30 mg were further added before incision.

Fentanyl 25 micrograms were topped up hourly and 15 ml of 0.25% ropivacaine was added on each side via QL Catheter 4 hours after initial plane blocks.

### Case 2

Forty-five years female diagnosed as Gall Bladder cancer planned for extended cholecystectomy.

A mixture fifty ml of 1% lignocaine with adrenaline and 0.33% ropivacaine was used in divided dose for Rectus sheath and TAP block on the both sides and 10 ml 1% Lignocaine with adrenaline was used for coeliac plexus block. Similarly, QL catheters were placed on either side under sonological guidance.

Dexmedetomidine was started at the rate of 1 microgram/kg/hour just before painting and draping and titrated in 0.2 to 0.7 microgram/kg/hour throughout the surgery.

Propofol 40 milligrams and fentanyl 50 micrograms were added before skin incision and 25 micrograms fentanyl hourly. As the duration of surgery was 2 hours, a bolus of 25 ml 0.2% ropivacaine was administered through QL catheters on each side at the end of surgery.

**Case 3**

Seventy years old male diagnosed with cancer of colon was posted for hemicolectomy.

A mixture fifty ml of 1% lignocaine with adrenaline and 0.33% ropivacaine was used in divided dose for Rectus sheath and TAP block on the both side and 10 ml 1% Lignocaine with adrenaline was used for coeliac plexus block. Similarly, QL catheters were placed on either side under sonological guidance.

Dexmedetomidine was maintained at the rate of 1 micrograms/kg/hour just before painting and draping and titrated in 0.2 to 0.7 micrograms/kg/hour throughout the surgery.

Propofol 40 mg and fentanyl 50 micrograms were added before skin incision and 25 micrograms fentanyl hourly. As the duration of surgery was two and half-hours, a bolus of 25 ml 0.2% ropivacaine each side were administered at the end of surgery.

Postoperatively, patients were kept in the intensive care unit (ICU). They continued to receive analgesia via QL catheters during the postoperative period. Ventilatory support, continuous positive airway pressure (CPAP) or inotropic support were not used postoperatively in all the three cases and they were shifted to the post-operative ward on the second or third postoperative day.

**Discussion**

Focusing on the recognized deficits and exploring various scopes for research is important to improve outcomes in the patients undergoing surgeries for cancer remedy. The delay in diagnosis, increasing age, pulmonary and cardiac comorbidities and poor socioeconomic status make these surgeries cumbersome. Moreover, the risk of atelectasis due to use 100% oxygen, delay in surgery due to less availability of ICU beds and frailty might be the cause for increased postoperative complications in these patients in our setting.

Various abdominal plane blocks like TAP and rectus sheath blocks are commonly used for postoperative analgesia. The use of ultrasound increases the accuracy of deposition local anaesthetic in a proper plane; hence not only analgesia but also anaesthesia and abdominal relaxation can be achieved. Julie T Vuong has demonstrated and recommended the use of TAP blocks as the primary surgical anaesthetic in patients undergoing laparotomy.<sup>2</sup>

QL block described recently have shown its efficacy as means of postoperative analgesia and a comparable alternative to epidural catheter.<sup>3</sup> Unlike epidural anaesthesia, with QL block there is the least chance of lower limb motor blockade as lumbar and thoracic spinal nerves supplying to abdominal wall are only blocked. The lower-limb sparing property aids in early mobility as well. We avoided mechanical ventilation, muscle relaxation was not used and autonomic reflex was not attenuated by

general anaesthesia. Hemodynamic reflexes to blood loss like tachycardia were probably revealed earlier and blood pressure was more responsive to fluid challenge.

Sedation requirement (ketofol) can also be reduced as low as 5 ml/hr. (i.e. propofol used was less than 25 micrograms/kg/hour) maintaining spontaneous respiration in the first patient. Sedation for other two patients could be maintained with Dexmedetomidine infusion (0.2 to 0.7 microgram/kg/hour). Thus consequences of mechanical ventilation were avoided; early ambulation and discharge from ICU were possible.

The influence of these techniques on improving mortality and morbidity for patient undergoing onco-surgeries is promising.<sup>4</sup> Further larger multicenter randomized trials are required to verify their efficacy.

**Consent:** Written informed consent was obtained from all the three patients for publication of report.

**Conflict of interests:** The authors declare no competing interests.

**Acknowledgement:** None

**Sources of Funding:** None

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