

CASE REPORT

Open Access



Quadratus lumborum (QL₁) block in a morbidly obese patient posted for laparoscopic mesh hernia repair: a case report

Amit Kumar Malviya, Debesh Bhoi, Virender Kumar Mohan and Anju Gupta*

Abstract

Background: Quadratus lumborum block has been claimed to provide effective analgesia in abdominal surgeries by covering both somatic as well as visceral pain. However, its utility in morbidly obese patients has not been reported or evaluated.

Case presentation: In this case report, of laparoscopic hernia repair in a morbidly obese patient (weight 110 kg, height 1.53 m, BMI 46.9 kg/m²), there was excellent perioperative analgesia with no rescue opioid consumption in intraoperative period and average VAS score of 3 in 24 h postoperatively. The first rescue analgesic was administered in the form of intravenous (IV) diclofenac 75 mg (diluted in 100 ml normal saline) 12 h after surgery when the patient reported a VAS of 5.

Conclusions: QL block is an effective, feasible, and safe option for providing analgesia for laparoscopic hernia repair in morbidly obese patients.

Keywords: Quadratus lumborum, Morbid obese, Analgesia

Background

Perioperative hypoxia, pneumonia, respiratory failure, and obstructive sleep apnea (OSA) are commonly associated with obesity posing risks of postoperative pulmonary complications and thus limit the use of long-acting opioids (Members of the Working Party et al. 2015). Thus, multimodal analgesic techniques with the inclusion of regional block are recommended for adequate analgesia and reducing opioid consumption. However regional blocks in obese patients are challenging, and BMI > 25 is an independent risk factor for regional block failure (Ingrande et al. 2009). Obese patients are mostly excluded from studies involving regional analgesia

techniques for perioperative pain, thus leaving the same underutilized and less studied analgesic strategies in obese patients. Quadratus lumborum block (QL) has been found to provide effective analgesia and reduce opioid consumption in abdominal surgeries, but its utility in obese patients has not been studied (Blanco 2007; Kadam 2013; Şalvız 2020). Here, we report a case of a morbidly obese patient managed with QL block for laparoscopic hernia repair. Written informed consent was taken from the patient for the block and publication of data without revealing identity.

Case presentation

A 53-year-old female, weighing 110 kg and height of 153 cm (body mass index (BMI) = 46.9 kg/m²), presented with paraumbilical swelling and a history of excessive snoring and dyspnea on exertion. On ultrasonography,

*Correspondence: dranjugupta2009@rediffmail.com

Department of Anaesthesia, Pain Medicine and Critical Care, All India Institute of Medical Sciences, New Delhi-110029, India

she had a grade III fatty liver and a right-sided paraumbilical hernia. She was planned for laparoscopic mesh hernia repair. On pre-anesthetic evaluation besides the history of hypertension, she had excessive snoring and dyspnea during normal physical activity (breath holding time 15 s), however, denied frequent awakenings or breathlessness during sleep, and daytime somnolence. She used to resort to lateral decubitus most of the time. Her pulmonary function tests (FVC = 83%, FEV1 = 68%, FEV1/FVC = 87%) revealed moderate obstruction with no significant reversibility. Room air arterial blood gas analysis (ABG) showed SaO2 = 93%, PaO2 = 66, PaCO2 = 38 mmHg. Echocardiography revealed a normal study with ejection fraction = 60%. Chest X-ray and ECG showed no abnormalities and the rest of the blood investigations were within normal limits. The patient was planned for surgery after 1 week of optimization with auto-continuous positive airway pressure (CPAP), incentive spirometry, steam inhalation, and nebulization with bronchodilators.

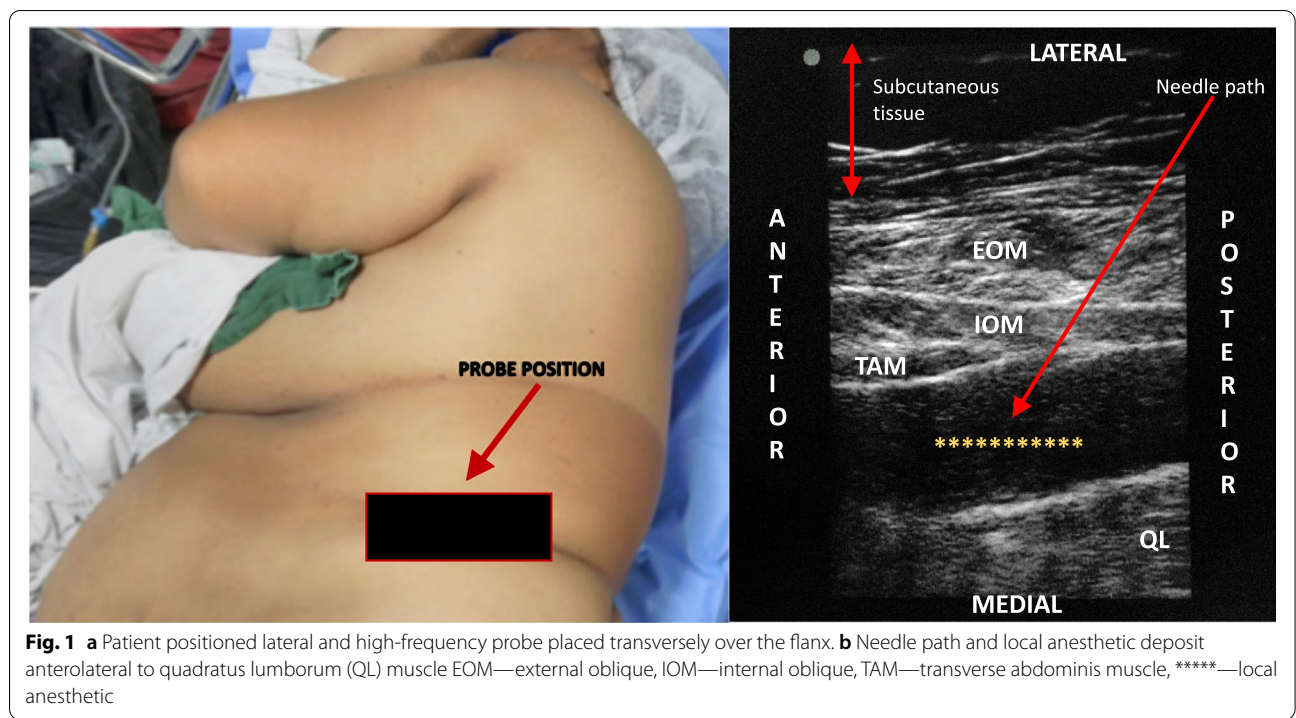
Standard fasting guidelines were obeyed, and the patient was shifted to pre-anesthesia room, where all standard American Society of Anesthesiologist (ASA) monitors were attached and intravenous (IV) access was secured.

For QL block, the patient was positioned in the right lateral position, so that the pannus will shift forward, and a wedge was placed below the flank to increase the space between the iliac crest and costal margin (Fig. 1a).

A high-frequency (13–6 Hz) linear ultrasound (Sonosite Edge Bothell, WA, USA) probe was placed over the flank transversely. After identifying the layers of the anterior abdominal wall and QL, a 22-g 10-cm echogenic needle (Pajunk, Gesingein, Germany) was introduced in the plane to the probe after local skin infiltration with 2% lignocaine. The needle was then advanced further to place the tip anterolateral to the QL muscle. Once the fascia was popped the tip was confirmed with 1 ml saline following which 30 ml 0.375% ropivacaine was deposited. The drug could be seen spreading both anterior and posterior to the QL muscle (Fig. 1b).

Once the block was performed patient was shifted to the operation table and positioned in the ramp position. The patient was pre-oxygenated and general anesthesia was induced with IV fentanyl 50 mcg, propofol 150 mg, and suxamethonium 200 mg. The airway was secured under direct laryngoscopic vision, using size 7.5 cuffed endotracheal tube and anesthesia was maintained with oxygen (50%), air, and desflurane (minimum alveolar concentration = 1). Neuromuscular blockade was maintained with atracurium boluses.

Intraoperatively one 12 mm and two 5 mm ports were made on the left lateral abdominal wall (Fig. 2a). Pneumoperitoneum was achieved and maintained at 15 cm H2O pressure. A 3 × 3 cm paraumbilical defect was seen and contents reduced completely, sealed with 15 × 15 cm proline mesh. The surgery lasted 40 min uneventfully with minimal blood loss. Vitals remained stable



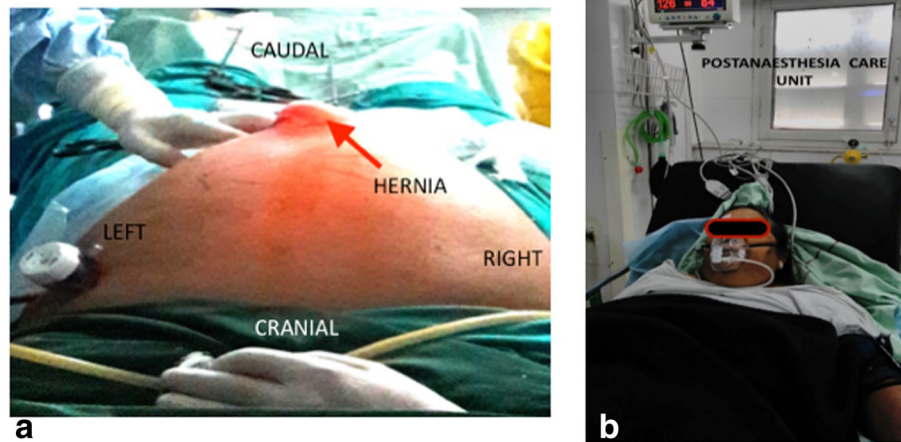


Fig. 2 a Pneumoperitoneum with port insertion site and hernia location. b Patient lying comfortably in post-anesthesia care unit

throughout the surgery and there was no requirement of rescue opioids intraoperatively. IV paracetamol 1 g and ondansetron 8 mg were administered before closure. Neuromuscular blockade was reversed with neostigmine and glycopyrrolate and the trachea was extubated after confirming the adequacy of consciousness, minute volume and regular breathing. Patient was awake, conscious, and pain free after extubation.

Postoperatively, patient was quite comfortable, however, kept in a high dependency unit for observation and auto CPAP was applied in a propped-up position (Fig. 2b). IV paracetamol 1 gm was continued 6th hourly and pain was assessed by visual analog scale (VAS 0 being no pain 10 worst pain) at 30 min 2, 4, 6, 8, 12, 24 h. Around 12 h after surgery, she had VAS > 4 on straining, which was subsided by IV diclofenac 75 mg diluted in 100 ml normal saline. In 24 h, the average VAS was 3. The next day morning, patient was mobilized during which she complained of mild pain (VAS of 3). Thereafter, she was started on oral tablets of paracetamol which provided adequate analgesia to the patient during the follow-up period. There was no supplementary opioid rescue and no episode of vomiting.

Discussion

Regional blocks in morbidly obese patients have been associated increased number of attempts, a higher rate of block failure and block-related complications due to technical difficulty in obese patients (Ingrande et al. 2009; Brodsky and Mariano 2011). This makes regional analgesia an underutilized technique in obese patients. Ultrasound guidance may help to improve block success, improve safety profile, and reduce the minimum effective dose of local anesthetics for regional blocks

(Erdogmus et al. 2021). However, due to dense and thick adipose tissue, anatomical landmarks may be difficult to identify and may lie deeper than in non-obese patients. Block technique requires more vertical needle insertion to reach the target tissue under ultrasound guidance. Thus, we made the patient lateral rather supine as by the conventional described technique, which helped to shift the pannus more medially and the needling was easier even with a high-frequency probe.

Blanco R. first described QL block and has claimed to provide better analgesia than TAP block as it also blocks visceral pain (Blanco 2007; Blanco et al. 2016). However, its efficacy in morbidly obese patients has not been reported or studied.

Curvilinear probes with lower frequency and improved penetration can be used in obese patients, but this compromises on quality of ultrasound image. We could obtain good ultrasound image of landmarks for QL1 block using linear probe in this patient (Fig. 1) and performed this block using linear probe. As described above, this provided effective postoperative analgesia and first analgesic demand was after 12 h postoperatively.

Review of literature does not reveal any case report or studies on effectiveness of QL block for analgesia in abdominal surgeries in morbidly obese patients with OSA. Kadam VR (Kadam 2013) reported a case of effective perioperative analgesia using QL block for laparotomy in a patient with cardiomyopathy, diabetes, and OSA requiring CPAP. However, the weight or BMI of the patient was not mentioned. The author reported a lesser requirement of opioids on the first postoperative day as compared to the second postoperative day. This was of special importance as the patient had OSA.

Randomized controlled trials are needed to further study the effectiveness of various doses of local anesthetics and various approaches to QL block and other truncal blocks in morbidly obese patients undergoing abdominal surgeries.

Conclusions

QL1 block is a relatively superficial approach to QL block which is an effective, feasible, and safe option for providing regional analgesia in morbidly obese patients where access to deeper approaches like transmuscular approaches is difficult.

Abbreviations

BMI: Body mass index; CPAP: Continuous positive airway pressure; FEV: Forced expiratory volume; FVC: Forced vital capacity; IV: Intravenous; OSA: Obstructive sleep apnea; QL: Quadratus lumborum.

Acknowledgements

None.

Authors' contributions

AM contributed to the conception and drafting, gave final approval, and agreed to be accountable for all aspects of the work. DB contributed to the conception, helped in critical revision for intellectual content, gave final approval, and agreed to be accountable for all aspects of the work. VKM helped in critical revision for intellectual content, gave final approval, and agreed to be accountable for all aspects of the work. AG contributed to the conception, helped in critical revision for intellectual content, gave final approval, and agreed to be accountable for all aspects of the work. All authors read and approved the final manuscript.

Funding

None

Availability of data and materials

The details have been included in the case report.

Declarations

Ethics approval and consent to participate

NA.

Consent for publication

Written informed consent to publish this information was obtained from study participants.

Competing interests

The authors declare that they have no competing interests.

Received: 19 November 2021 Accepted: 10 September 2022

Published online: 24 September 2022

References

- Blanco R (2007) TAP block under ultrasound guidance: the description of a 'non-pops technique'. *Reg Anesth Pain Med* 32(supplement 1):130
- Blanco R, Ansari T, Riad W, Shetty N (2016) Quadratus lumborum block versus transversus abdominis plane block for postoperative pain after cesarean delivery. *Reg Anesth Pain Med* 41:757–762
- Brodsky JB, Mariano ER (2011) Regional anaesthesia in the obese patient: lost landmarks and evolving ultrasound guidance. *Best Pract Res Clin Anaesthesiol* 25:61–72

- Erdogmus NA, Baskan S, Zengin M, Demirelli G (2021) What is the minimum effective volume of local anaesthetic applied in brachial plexus blockage with an axillary approach under ultrasonography guidance? *Cureus* 13:e16865. <https://doi.org/10.7759/cureus.16865>
- Ingrande J, Brodsky JB, Lemmens HJ (2009) Regional anesthesia and obesity. *Curr Opin Anaesthesiol* 22:683–686
- Kadam VR (2013) Ultrasound-guided quadratus lumborum block as a postoperative analgesic technique for laparotomy. *J Anaesthesiol Clin Pharmacol* 29:550–552
- Members of the Working Party, Nightingale CE, Margaron MP, Shearer E, Redman JW, Lucas DN et al (2015) Peri-operative management of the obese surgical patient 2015: Association of Anaesthetists of Great Britain and Ireland society for obesity and bariatric. *Anaesthesia* 70:859–876
- Şalvız EA (2020) Regional anesthesia in adult patients with obesity. *JARSS* 28:219–230

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Submit your manuscript to a SpringerOpen® journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)