Case Report

Quadratus lumborum block for post-operative pain relief in patient with Prune belly syndrome

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ABSTRACT

Abdominal field blocks are commonly used as part of multimodal analgesia for post-operative pain relief in patients undergoing abdominal surgery. Conventionally, transversus abdominis plane block is used, but has the disadvantage of limited spread only to T10–T12 segments, providing only partial pain relief. The new quadratus lumborum (QL) block has the advantage of providing wider sensory block from T6 to L1 and thus has an evolving role in opioid-free anaesthesia. Opioid-induced cough depression, urinary retention, and drowsiness can be problematic in patients with Prune belly syndrome, who have deficient abdominal muscles and myriad of genitourinary problems. We report a case of a young male with Prune belly syndrome, who had a pain-free post-operative period after high inguinal orchidectomy with unilateral QL block.

Key words: Abdominal surgery, quadratus lumborum block, prune belly syndrome, ultrasound

INTRODUCTION

Prune-belly syndrome is a congenital disorder that is characterised by the wrinkled appearance of the abdomen. Incidence is 1:40,000 live births and males are more commonly affected.[1] This syndrome includes the triad of congenital urinary tract anomalies, defects in the abdominal wall musculature and bilateral undescended testes.[1-3] The syndrome may be accompanied by cardiovascular, skeletal, gastrointestinal, respiratory, and central nervous system anomalies.[1-3] Several surgical interventions may be required due to the abnormalities present in Prune belly syndrome. Postoperative pain can be a major issue, as opioids can cause respiratory depression which can be problematic with deficient abdominal muscles. Regional blocks offer analgesia without having a depressant effect on respiration. In quadratus lumborum (QL) block, local anaesthetic (LA) is given at lateral border of QL muscle. This LA spreads to the paravertebral space and thus provides wide sensory blockade and adequate pain relief.[4] To the best of our knowledge, this is the only case report in literature, where unilateral QL block (QLB) has been used as part of multimodal analgesia in a patient with Prune belly syndrome.

CASE REPORT

A 22-year-old male patient weighing 79 kg, with Prune belly syndrome presented to us for right high inguinal orchidectomy. He had a history of multiple ureteric surgeries but none for abdominoplasty and had deficient abdominal muscles. The patient gave a history of bilateral optic nerve atrophy, and his vision was reduced to finger counting. Airway assessment was within normal limits. Pre-operative investigations, including electrocardiography (ECG) were normal. His exercise tolerance was more than 4 metabolic equivalents. The patient was apprehensive before surgery and refused for spinal anaesthesia. Therefore, QLB was explained as part of multimodal analgesia along with general anaesthesia (GA). He preferred to undergo the block under GA.

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Informed consent for GA and block was taken. Monitoring including Electrocardiogram (ECG), noninvasive blood pressure, pulse oximeter was applied once the patient was in the operative room. Anaesthesia was induced with propofol 2 mg/kg IV and fentanyl 2 mcg/kg IV. Atracurium 0.6 mg/kg was given for neuromuscular (NM) paralysis. The trachea was intubated with size 8 cuffed polyvinyl chloride (PVC) tube. Maintenance of anaesthesia was with 50:50 O_2 and air with sevoflurane. The abdomen was opened through right-side large paramedian incision extending from iliac fossa up to subcostal region as testis was placed high and the tumour was suspected. The surgery lasted for 1.5 h and was uneventful. At the end of the surgery, he was placed in the left lateral position to obtain an appropriate view of QL and transversus abdominis plane (TAP) extensions of the lateral abdominal muscles. Curvilinear probe (2–5 MHz) of SonoSite Edge portable ultrasound machine (FUJIFILM Sonosite, Inc. Bothell, WA 98021 USA) was used using all aseptic precautions. The probe was placed in the anterior axillary line transversally to visualise the typical triple abdominal layers. Then, the probe was moved to the posterior axillary line. Sonoanatomy showed the disappearance of transversus abdominis first followed by the internal oblique and external oblique converging as aponeurosis and appearance of QL muscle. Further movement of probe posteriorly also showed the origin of QL muscle from the transverse process of lumbar vertebra [Figure 1] thus, confirming the anatomy [Figure 2]. At the lateral border of QL and under the external oblique aponeurosis, 20 ml 0.2% ropivacaine was injected using a 21 G 100 mm Sonotap cannula (Pajunk USA). After giving the block, NM blockade was reversed with 0.5 mg glycopyrrolate and 2.5 mg neostigmine. Post-operatively, patient was prescribed intravenous paracetamol 1 g 6 hourly. Fentanyl patient-controlled analgesia (PCA) with bolus dose 20 μg and lockout period of 5 min was given as rescue analgesia. Fentanyl usage for next 48 h was recorded.

Post-operatively in recovery, the patient was comfortable and did not require any further analgesia. The pain was monitored every 2 h using Numeric Rating Scale 0–10, where 0 is no pain, and 10 is worst possible pain. The ipsilateral sensory block was from T8 to L1 (checked by cold alcohol swabs). The first analgesic request was about 6 h post-operative. After 15 h, he started experiencing pain requiring more fentanyl PCA amounting to 320 mcg for the remaining 9 h. The average pain scores on day 1 were 3/10 at rest and 6/10 on coughing and patient was comfortable. On the 2nd day, the pain scores were 5/10 and 7/10 requiring 600 mcg of fentanyl over 24 h.

DISCUSSION

Management of Prune belly patient requires meticulous anaesthetic considerations to avoid post-operative complications. These patients present for a myriad of surgical procedures on genitourinary tract including nephrectomies. Usually, opioid-free anaesthesia is preferred, as narcotics can lead to urinary retention. Furthermore, narcotics have central depressant action rendering the patient drowsy for micturition stimulus to be sensed. There is a defect in abdominal musculature and diaphragm is relatively flat in these patients leading to ineffective cough.[2,3] Opiate

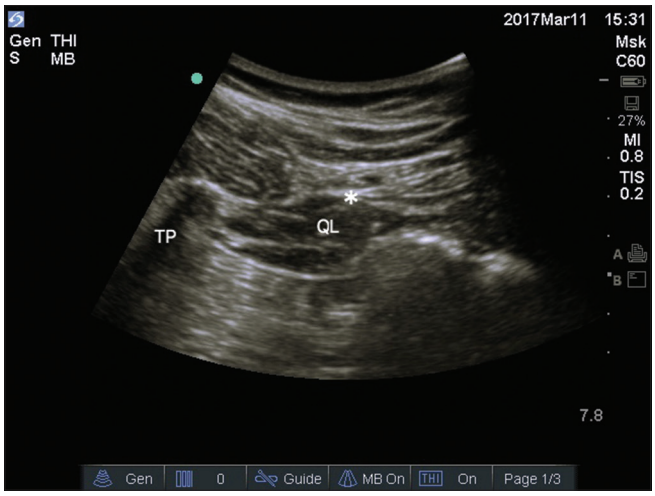

Figure 1: Sonographic anatomy of QL muscle. QL – Quadratus lumborum muscle; TP – Transverse process. *Aponeurosis of abdominal muscle

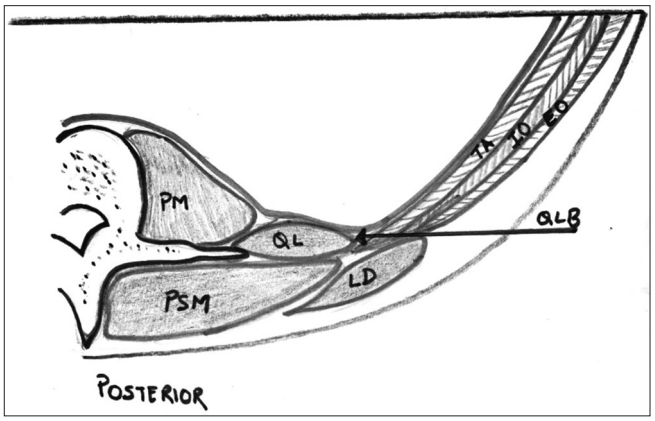

Figure 2: Pictorial representation of QL block. TA – Transversus abdominis muscle; IO – Internal oblique; EO – External oblique; LD – Latissimus dorsi muscle; PSM – Posterior spinal muscle; PM – Psoas muscle; QL – Quadratus lumborum muscle; QLB – Quadratus lumborum block

analgesia can compound this problem, therefore should be used with caution. Regional anaesthesia is usually the best option with or without GA.

In our case, the patient opted for GA. We decided to give QLB over TAP block because the incision was anticipated to be large as the testicular tumour was suspected. In our practice, we would give blocks at the end of the surgery to maximise the duration of post-operative analgesia. The analgesic requirement of the patient was low on the first day. In fact, he started to use fentanyl PCA only after 15 h of surgery. Fentanyl consumption was almost double on the second post-operative day after the effect of the block wore off, indicating effectiveness of block.

Conventionally, TAP block has been used for abdominal surgeries, but has the disadvantage of limited spread to two to three segments only. The new QLB has the advantage of a wider sensory block from T6 to L1. QLB is not the posterior extension of the TAP block as described by Blanco initially.[5] LA deposited at the lateral border of QL (QL 1 block by Blanco) spread anterior and cranial to QL muscle to lie in the paravertebral space providing a greater spread of the drug imparting larger sensory block. Carney *et al*.,[4] described that the contrast solution placed posteriorly accumulates near the lateral border of the QL and then spreads in a posterior and cranial fashion to the anterior aspect of the QL and psoas major to lie at the paravertebral space. This block is superior to TAP block. Murouchi *et al*.,[6] in 2016 compared single injection QL and TAP block and concluded that QLB resulted in a and longer lasting analgesic effect as compared to TAP block. Pain relief for longer duration can be provided by continuous catheter technique which is under evaluation in our institution.

There are no studies reporting complications after ultrasonography-guided QLB. Theoretically, haematoma and organ damage is possible if needle direction is too anterior.

CONCLUSION

Our case report highlights the use of QLB for post-operative analgesia in major abdominal surgery, especially where epidural is contraindicated or difficult. Bilateral blocks are recommended in abdominal surgeries needing midline incision. Pain relief can be extended with the use of continuous catheters. More trials comparing QL and TAP block are needed to establish its role in clinical practice.

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Conflicts of interest

There are no conflicts of interest.

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