



Case Report

Obstructed umbilical hernia repair under bilateral rectus sheath block for a high-risk patient: A case report

Alex Francisco Nicholas¹, Sinchu Mary Babu^{1*}, Renu Devaprasath¹

¹Dept. of Anaesthesiology, Dr. Jeyasekharan Hospital and Nursing Home, Nagercoil, Tamil Nadu, India



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ABSTRACT

We present a case of an open hernia repair for an obstructed Umbilical Hernia for a 77-year-old male patient categorized as ASA 4E with multiple comorbidities under Bilateral Rectus Sheath Block. A bilateral rectus sheath block was performed under real-time ultrasonographic guidance. He is a known case of coronary artery disease and double vessel disease and was on dual antiplatelet therapy. Due to the patient's significant perioperative risks, the surgery was performed under ultrasonography-guided bilateral rectus sheath block. The patient tolerated the surgery well, with minimal further sedation.

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1. Introduction

Schleich first described the use of bilateral rectus sheath blocks in 1899, intending to provide muscle relaxation and analgesia for abdominal wall surgeries by blocking the terminal branches of the thoracolumbar nerves within the substance of the rectus abdominis muscle before the introduction of neuromuscular blocking drugs.¹ It was initially performed as a blind, loss-of-resistance technique. BRSBs have previously remained underutilised, mainly due to concerns over the accuracy of needle tip placement, particularly with vascular structures within the rectus sheath and visceral structures within the underlying peritoneal cavity.

BRSBs are ideally suited for ultrasound guidance because the RAM, layers of the rectus sheath, and important vascular structures can be easily identified using ultrasound technology. In several previously reported cases, it was the sole anaesthetic used for elective umbilical surgery in high-risk patients with poor cardiovascular and physiological reserves.^{2–4}

* Corresponding author.

E-mail address: sinchubabu11@gmail.com (S. M. Babu).

2. Case Report

A 77-year-old weighing 78 kg presented to the casualty with complaints of pain and swelling around the umbilicus, which was associated with vomiting. The patient was an old case of non-Hodgkin's lymphoma, for which he underwent five cycles of chemotherapy. He was also on dual antiplatelet therapy for coronary artery disease; the last dose was administered on the previous day of symptoms. His last echocardiography showed old inferior wall myocardial ischaemia, severe LV dysfunction, moderate AR, mild PAH, and EF-29%. Preoperative examination indicated limited physical activity and shortness of breath on exertion. There were no complaints of chest pain or breathing difficulties while lying down. His blood investigations show Hb-12.5g/dl, platelet- 2,06,000/mm³, INR- 1.01, pro- BNP- 7629 pg/ml. Computed tomography (CT) of the abdomen and thorax showed an umbilical hernia with omentum and bowel loops as contents and bilateral moderate pleural effusion with subsegmental atelectasis of the underlying lung.

After discussion with the surgeon, the team decided to perform surgery under a bilateral rectus sheath block with

judicious sedation. The patients were informed about the cardiac status, risks associated with general anaesthesia and postoperative ventilation, and risks associated with neuraxial blockade. Central neuraxial blockade was not performed, as the patient was on antiplatelet therapy, and the haemodynamic changes associated with spinal anaesthesia were detrimental. ASA standard monitors, such as electrocardiography, pulse oximetry, and non-invasive blood pressure monitoring, were connected. The left radial arterial line was established for invasive blood pressure monitoring and oxygen was supplemented via a face mask at six l/min. The patient was administered Inj. Fentanyl (100 µg) and dexmedetomidine infusion were started for patient comfort and anxiolysis at @12mcg/min.

Skin asepsis was ensured, and a Bilateral rectus sheath block was performed with real-time ultrasonographic guidance with a 23 G spinal needle via an in-plane approach. The external oblique muscle (EOM), internal oblique muscle (IOM), and transversus abdominis muscle (TAM) collectively form the anterolateral abdominal wall. As these muscles approach the midline, they taper into the aponeuroses, which ultimately merge to create the tendinous rectus sheath that encases the rectus abdominis muscle. These aponeuroses blend with the aponeuroses on the opposite side along the midline to form the linea alba.

With the patient positioned supine, the ultrasound transducer was placed transversely above the umbilicus, approximately 1 cm from the midline. The rectus abdominis muscle and posterior rectus sheath were identified as thick, lenticular-shaped muscles with deep hyperechoic fascial covering. The transverse abdominis muscle was identified by lateral scanning and visualising the thinnest and most hypoechoic lateral abdominal wall muscles. The needle was inserted using an in-plane technique directed from the medial to the lateral direction. Once the needle tip was positioned posterior to the rectus abdominis muscle and anterior to the posterior sheath, a small amount of saline was administered to hydrodissect the tissue and confirm needle placement prior to the injection of the local anaesthetic.

After confirmation, 15 ml of 0.25% bupivacaine was given on both sides, and skin infiltration was done with 10 ml of 1% lignocaine along the incision line. Surgery was started 20 mins after the block, and the patient remained comfortable and hemodynamically stable throughout the surgery. No other drugs were required for the 55-minute surgery, and the patient was monitored in the postoperative care unit.

He was discharged five days after surgery and underwent suture removal two weeks.

3. Discussion

The administration of safe anaesthesia to older adults with multiple comorbidities is a major challenge for anaesthesiologists. Regional nerve blocks are being

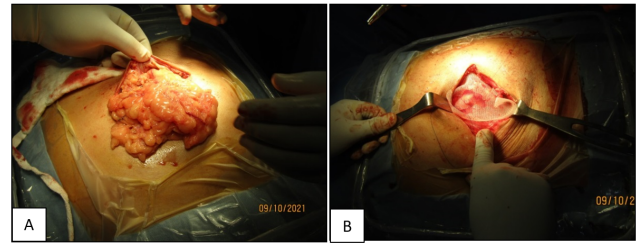


Figure 1: A): Umbilical hernia showing the omentum as content; b): After mesh placement

explored as possible alternatives, whenever feasible. The central portion of the anterior abdominal wall is innervated by the ventral branches of the T7–T11 spinal nerve roots, which lie between the rectus abdominis muscle and the posterior rectus sheath and enter the rectus muscle near the midline.⁵ As the tendinous intersections of the rectus muscle are not fused to the posterior rectus sheath, local anaesthetic from a single injection site can spread cephalocaudally within this compartment.

The technique has been well described by Ferguson et al.⁶ A 23-gauge needle is inserted above or below the umbilicus, 0.5 cm medial to the linea semilunaris in a perpendicular plane. Under the ultrasound technique, an in-plane method is ideally suited for this block, aiming from lateral to medial. Before needling, Doppler imaging should be performed to assess the position of the inferior epigastric artery.

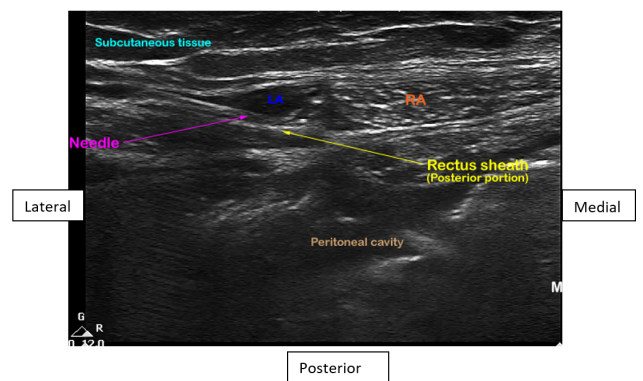


Figure 2: Anatomy of rectus sheath

The extent of a sensory blockade is variable, as it depends on the spread of local anaesthetics within musculofascial planes to anaesthetize multiple small nerves or plexuses and the anatomical course of the nerves being targeted.⁷

Berna Caliskan et al.⁸ reported 3 cases of simple periumbilical surgery performed under an ultrasound-guided rectus sheath block. Two patients tolerated the surgery well with minimal sedoanalgesia, and one required dissociative anaesthesia to be compatible. They concluded that the rectus sheath block was an underused technique and

that it would be wise to use it whenever feasible.

Another case was reported by Rodriguez et al.⁹ of a patient diagnosed with Wolff Parkinson White syndrome, in whom umbilical hernia repair was managed solely by ultrasound-guided RSB. Rectus sheath block was accomplished with haemodynamic stability to avoid sympathetic blockage caused by regional anaesthesia. Another retrospective study by Kwon HGet al., on 4033 procedures, investigated the complications of real-time ultrasound-guided rectus sheath blocks, which reported 96 complications, i.e., 2.4%, hence considered an easy and safe procedure.¹⁰

Ultrasound guidance¹¹ has improved the performance of RSB, ilioinguinal blocks, and transversus abdominal plane blocks. It provides real-time information regarding the location of the needle tip and local anaesthetic delivery to the desired plane. This avoids injury to the vascular structure and results in lower doses of local anaesthetics, thereby decreasing the risk of local anaesthetic systemic toxicity. Ultrasound-guided RSBs were widely used for umbilical hernia repair as superior analgesia compared to infiltration in the paediatric population.¹²

4. Conclusion

The rectus sheath block not only eliminates the risks to high-risk patients but also favours daycare surgery because it preserves motor power, thus allowing the patient to be discharged early. In this case postoperative period was uneventful and patient was immediately ambulated and discharged after 5 days Rectus sheath block is an underused technique that can be used as a sole anaesthetic technique in selected cases. This could also eliminate opioids and NSAIDs, especially in elderly patients with multiple comorbidities, as in the present case. The emphasis of this case report is that the rectus sheath block is an extremely useful tool in patients with other comorbidities for which administering a central neuraxial block or general anaesthesia is detrimental. Expertise in USG guided peripheral nerve blocks is essential for a modern-day anaesthesiologist, especially for high-risk cases.

5. Source of Funding

None.

6. Conflicts of Interest

None.

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Author biography

Alex Francisco Nicholas, Consultant

Sinchu Mary Babu, Resident

Renu Devaprasath, Consultant

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