

Umbilical Hernia Repair under Bilateral Rectus Sheath Block: A Case Report

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Abstract

Background

Anesthetic management of patients with impaired left ventricular function undergoing noncardiac surgery is a challenge. These patients are at increased risk of perioperative hemodynamic instability, acute coronary events, and major cardiac events.

Case Presentation

We report a case of a 60 years old woman with coronary artery disease with left ventricular dysfunction planned for elective umbilical hernia repair who was managed with bilateral rectus sheath block as a sole anesthetic.

Conclusions

The bilateral rectus sheath block offered a stable hemodynamics and an adequate anesthesia for the surgery.

Keywords: Case Report, Coronary Artery Disease, Left Ventricular Dysfunction, Nerve Block, Umbilical Hernia, Regional Anesthesia.

Introduction

An umbilical hernia is the protrusion of intra-abdominal contents like omentum or bowel through an opening in the muscles of the abdominal wall situated at or near the umbilicus, affecting approximately 2% of the population. Open umbilical hernia repair is a common procedure conventionally performed under general anesthesia. Bilateral rectus sheath block is commonly performed to provide supplemental analgesia for this procedure. We here describe the clinical case of a patient for an umbilical hernia with cardiac comorbidities and who was successfully operated under bilateral rectus sheath block as a sole anesthesia.

Case report

A 60-year-old lady with umbilical hernia containing a part of the omentum was planned electively for surgery. She was planned for open anatomical repair of umbilical hernia. She had hypertension with multiple incidence of myocardial infarction over 10 years last attack 3 years back and was under aspirin, atorvastatin, enalapril, isosorbide mononitrate, furosemide, spironolactone and metoprolol. She had no previous surgeries. She had no documentation of her last angiogram which was done 3 years back.

The patient does not give any history suggestive of heart failure. Her metabolic equivalent (METs) was >4.

On examination, she was found to have mild bipedal pitting edema. The biochemical analysis, coagulation profile and chest radiograph were normal. Her electrocardiograph showed symmetrical T inversion extending from V1 to V5. Her recent cardiac markers were normal. Echocardiography reported hypokinetic left anterior descending (LAD) artery territory with aneurysmal apex, mild mitral regurgitation (MR), moderate LV diastolic dysfunction with left ventricular ejection fraction (LVEF) 30-35%. The umbilical hernia had a 11.4mm diameter defect in the anterior abdominal wall with protrusion of mesentery.

Anatomical repair was planned under bilateral rectus sheath block. The patient was advised to continue all her regular medications including aspirin.

Standard operating monitoring which included electrocardiography, pulse oximetry and non invasive blood pressure measurement was performed. Intravenous access was secured with 20 G cannula in the forearm. Under all aseptic precaution, the rectus sheath block was performed bilaterally with real time ultrasonographic guidance using 22 gauge (100mm) needle using linear transducer via in-plane approach. 0.25% ropivacaine 15ml each in the space between the rectus abdominis and the posterior rectus sheath. (Figs. 1a & b).

Figure 1a: *rectus abdominis muscle*

Fig 1b: local anesthetic deposited between rectus abdominis muscle and posterior rectus sheath

After ensuring adequate block at 10 minutes, surgery was started. A small transverse infra-umbilical incision was given above the swelling. The surgical procedure took place uneventfully. The duration of the surgery was 80 minutes and the patient was comfortable throughout this period. No additional opioids or sedation was supplemented.

She did not require other analgesics in post anesthetic care unit and was discharged to ward from the hospital after 3 hours of surgery without any complications.

Discussion

Left ventricular systolic dysfunction refers to a ventricular ejection fraction (LVEF) of less than 50% by echocardiography.¹ Our patient had moderate to

severe left ventricular systolic dysfunction (LVEF =30%) associated with coronary artery disease (CAD) involving the left anterior descending artery territory. Patients with CAD undergoing noncardiac surgery are at increased risk of perioperative cardiac events demanding intense anesthetic management.²

Perioperative hemodynamic goals for the above cardiac pathology is to limit preload, avoid increases in heart rate, maintain myocardial contractility, decrease afterload, and maintain oxygen demand delivery balance.

Most anesthetic agents that we routinely use causes significant reductions in LVEF.³ Hypotension and volume overload could potentially precipitate myocardial ischemia in our patient.

A sensory block from T9-T11 is required for the operative procedure.⁴ Jyotsna Bhargava et al⁵ successfully managed a case of severe LV dysfunction with obstructed umbilical hernia with thoracic epidural anesthesia. Neuraxial anesthesia is generally chosen over general anesthesia because there is reduction of left ventricular after load, avoidance of sympathetic stimulation on airway management and better perioperative pain management.

Abdominal wall blocks are an attractive alternative to spinal anesthesia where possible. It avoids hypotension, motor block, and neuraxial hematoma⁶. Various abdominal wall blocks like transversus abdominis plane block, rectus sheath blocks have been used for perioperative analgesia in many surgeries involving the abdomen.^{7,8} The blocks were first described in 1899 by Schleich.⁹ Umbilical hernia repair was first successfully performed under rectus sheath block by Ferguson in 1996.¹⁰ It provides somatic analgesic effect to the anteromedial abdominal wall and periumbilical area by blocking nerve conduction at the terminal branches of T9 to T11, but excludes innervation to the viscera. Surgery in our case was limited to the abdominal wall, hence, feasible for the procedure as the sole anesthetic. Quek et al¹¹ describes periumbilical hernia performed under bilateral rectus sheath block and highlights the advantages offered by the block for a severely reduced LVEF.

Conclusion

Abdominal blocks can serve as a sole anesthetic for surgeries involving the abdominal wall and it is especially advantageous for patients who have limited cardiovascular reserve.

References

1. Roberto M. Lang, Luigi P. Badano, Victor Mor-Avi, Jonathan Afilalo, et al. Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging *Journal of American Society of Echocardiography* 2015;28:1-39
2. Sonksen J, Gray R, Hickman PH, et al. Safer non-cardiac surgery for patients with coronary artery disease. Medical treatment should be optimized to improve outcome. *Br Med J* 1998; 317: 1400-01
3. Tanaka DM, Romano MMD, Carvalho EEV, Oliveira LFL, et al. Effect of different anesthetic agents on left ventricular systolic function assessed by echocardiography in hamsters. *Braz J Med Biol Res.* 2016; 49(10): e5294
4. Yarwood J, Berrill A. Nerve blocks of the anterior abdominal wall. *Continuing Education in Anaesthesia, Critical Care & Pain* 2010;10 Number (6):182-6
5. Bhargava J, Tiwari RJ, Bana M, Agarwal A. Perioperative management of a patient with left ventricular dysfunction and anomalous coronary arteries. *Journal of Anaesthesiology Clinical Pharmacology* 2016; 32 (1):103-5
6. Onwochei DN, Børglum J, Pawa A. Abdominal wall blocks for intra-abdominal surgery. *BJA Education* 2018;18(10): 317e322
7. Crosbie EJ, Massiah NS, Achiampong JY, Dolling S, et al. The surgical rectus sheath block for post-operative analgesia: a modern approach to an established technique. *European Journal of Obstetrics and Gynaecology and Reproductive Biology* 2012;160(2):196-200
8. Teshome D, Hunie M, Essa K, Girma S, Fenta E. Rectus sheath block and emergency midline laparotomy at a hospital in Ethiopia: A prospective observational study. *Annals of Medicine and Surgery* 2021; 68:102572
9. Schleich DL. *Schmerzlose Operationen*. 4th ed. Berlin: Springer Verlag, 1899: 240-58
10. Furguson S, Thomas V, Lewis I. The rectus sheath block in paediatric anaesthesia: new indications for an old technique? *Paediatr Anaesth* 1996;6(6):463-6.
11. Quek KHY, Phua DSK. Bilateral rectus sheath block as the single anaesthetic technique for an open infraumbilical hernia repair. *Singapore Med J* 2014; 55(3): e39-e41