



# Anaesthetic Management of Open Epigastric Hernioplasty in Patient with Coronary Artery Disease with Compromised Left Ventricular Systolic Function

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## Abstract

Coronary Artery Disease patients with moderate left ventricular ejection fraction undergoing open epigastric hernioplasty needs advance planning. The goal is to avoid significant increase in heart rate which in turn leads to decrease in left ventricular ejection fraction. Tachycardia increases the risk of perioperative myocardial infarction, congestive heart failure and pulmonary edema by reducing coronary blood flow. Rectus sheath block attenuates the stress response and gives good perioperative analgesia. This case report describes the anaesthesia management and effectiveness of ultrasonography guided Rectus Sheath Block.

**Keywords:** Coronary artery disease; Left ventricular ejection fraction; Percutaneous transluminal coronary angioplasty; Rectus sheath block

## Introduction

The International Association for the Study of Pain defined pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage [1]. Laparotomies that necessitate midline incisions were commonly accompanied by postoperative pain, typically associated with neuroendocrine stress response [2,3]. In our case, patient was having compromised left ventricular function so we planned ultrasonography (USG) guided bilateral rectus sheath block (RSB) along with General anaesthesia (GA) for open epigastric hernioplasty. Postoperative analgesia enhances early mobilization and decreases the incidence of postoperative pneumonia and deep venous thrombosis [4,5]. Schleich firstly described RSB in 1899 aiming at the deposition of local anaesthetic (LA) in the virtual space between the posterior wall of the rectus abdominis muscle and its sheath [6]. The anaesthetic

injected into this space is proposed to spread freely up and down and to block the anterior branches of the thoracoabdominal nerves before they leave the rectus sheath [7-9]. The central portion of the anterior abdominal wall is innervated by the ventral branches of the lower thoracic nerves (T6-T12); these ventral branches lie between the rectus abdominis muscle (deep) and the posterior rectus sheath (ventral) and enter the rectus muscle near the midline [10-13]. USG guided RSB provides excellent perioperative pain relief and prevents complications like perioperative MI followed by left ventricular failure and pulmonary edema.

## Case Report

52 years male, weighed 70kgs was planned for open epigastric hernioplasty. He was a chronic smoker with diabetic, hypertensive and hypercholesterolemia. He was a known case of

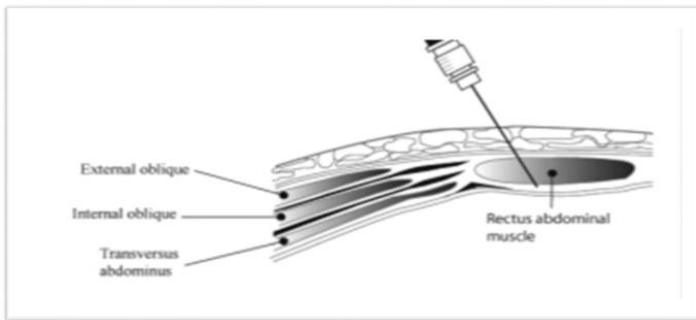
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coronary artery disease (CAD), with post percutaneous transluminal coronary angioplasty (PTCA) with global regional wall motion abnormality (RWMA), Ejection fraction 35%, Grade II left ventricular systolic dysfunction. He was on oral hypoglycemic drugs, antihypertensive drugs and statins. Tablet aspirin was stopped 5 days prior to surgery. Cardiologist categorized this case under intermediate risk procedure after cardiac assessment. Considering other comorbidities, written informed high risk consent has taken. Routine standard monitoring was done. Intravenous 18G cannula secured in left upper limb. Lactated ringer solution infused. After 100% preoxygenation, he was induced with intravenous (IV) glycopyrolate 0.2 mg, IV ondansatrom 4 mg, IV midazolam 1mg, IV morphine 3mg, IV etomidate 16mg and IV remifentanyl 30 micrograms bolus. Size four I-gel supraglottic airway device was inserted and connected to ventilator on volume control mode with 500ml tidal volume, respiratory rate 14/min and pressure support of 12. IV cisatracurium 12mg bolus given. He was on oxygen, air, Sevoflurane and titrated dosage of morphine to maintain sinus rhythm, normotension and desirable MAC (Figure 1).



**Figure 1:** Rectus sheath block, with depiction of needle position and location of local anesthetic injection.

Intraoperatively 500 ml of lactated solution infused intravenously. Under all aseptic conditions, USG guided bilateral rectus sheath block has given with 20 ml of 0.5% bupivacaine plus morphine 3mg. Intraoperative period was uneventful. At the end of surgery he was reversed with IV neostigmine 2.5 mg with IV glycopyrolate 0.4 mg and extubated smoothly without significant pressor response. Post operatively patient was free from pain as well as respiration was smooth and regular.

## Discussion

The RSB was performed by an experienced anesthetist using a USG technique. After confirming the potential place and a negative aspiration for blood, 20 ml of 0.5% bupivacaine plus morphine 3mg was deposited on the posterior wall of the rectus sheath bilaterally. A bilateral USG rectus sheath block provides analgesia to the anteromedial abdominal wall which is innervated by the ventral branches of the lower thoracic nerves (T6-T12);

these ventral branches lie between the rectus abdominis muscle (deep) and the posterior rectus sheath (ventral) and enter the rectus muscle near the midline. The technique blocks the anterior cutaneous branches of the intercostal nerves, and therefore, it is well suited for postoperative analgesia for epigastric region and midline abdominal incisions. [10-13]. Attenuation of stress response is utmost importance especially in CAD patient for any kind of surgery. The goal is to avoid significant increase in heart rate which in turn leads to decrease in left ventricular ejection fraction. Tachycardia increases the risk of perioperative myocardial infarction (MI), congestive heart failure (CCF) and pulmonary edema by reducing coronary blood flow [14-16]. In our case, we attenuated the stress response to intubation with IV morphine, IV etomidate and IV remifentanyl. Whereas surgical response was blunted with additional bilateral RSB. USG guided bilateral RSB has provided intra operative as well as post-operative pain relief. Morphine was used as an adjuvant to LA extended the pain relief for 10 hours.

RSB is effective in reducing the severity of postoperative pain score, analgesics consumption and increases time to first analgesic request [17-21].

## Conclusion

The bilateral USG guided RSB might be an effective perioperative analgesic option for open epigastric hernioplasty procedure in CAD with left ventricular systolic dysfunction. Maintaining stable heart rate and blood pressure in the perioperative period prevents cardiac complications like MI, CCF and pulmonary edema. So, RSB provides not only better postoperative outcome but helps in early mobilization with opioid sparing. This block is effective in reducing the first 24 h of postoperative analgesic consumption.

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