

## Anaesthetic Management of Post-CABG Patient for Laparoscopic Incision Hernia Repair at Sternotomy Incision Site

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**Abstract:** Pneumoperitoneum by CO<sub>2</sub> for laparoscopic surgery results into ventilator and respiratory changes. In compromised patients, cardio-respiratory disturbances aggravate increase in PaCO<sub>2</sub> and enlarge the gradient between PACO<sub>2</sub> and PETCO<sub>2</sub>. Changes in PETCO<sub>2</sub> are more common in hernia repair because of subcutaneous absorption of CO<sub>2</sub>, which results into decrease in cardiac output, increase in arterial BP and increase in SVR and PVR. These changes are accentuated in high-risk cardiac patients. We describe the first case of post-CABG patients operated for sub-xiphoid incisional hernia repair under general anaesthesia with thoracic epidural anaesthesia. Patient had grade 3 dyspnoea and intermittent chest pain, which increase cardiac risk of patient for anaesthesia. Patient was taken up for surgery after cardiology reference and by keeping ventilator ready in SICU with ASA grade 4 risk. Electrolyte levels, PT, INR levels after stopping antiplatelet agents were normal preoperatively; patient sedated with Fentanyl and Midazolam. Epidural catheter placed at thoracic level T8-T9 to decrease intraoperative anaesthetic requirement and postoperative pain relief to prevent stress response. Patient was given general anaesthesia with Inj. Propofol and Inj. Vecuronium and maintained with Sevoflurane to keep MAC level 1.2-1.5 at end tidal concentration. BIS monitor applied to maintain depth of anaesthesia at 40-60 score. Controlled ventilation carried out to maintain ET-CO<sub>2</sub> at normal range. Postoperatively patient was observed for pain, hypertension. Tachycardia and treated accordingly.

**Keywords:** Post-CABG patient, Sternotomy incisional hernia repair, Laparoscopic surgery

### INTRODUCTION

Pneumoperitoneum by CO<sub>2</sub> used for laparoscopic surgery results into ventilator and respiratory changes. In compromised patients cardio-respiratory disturbances aggravate increase in PACO<sub>2</sub> and enlarge the gradient between PACO<sub>2</sub> and PETCO<sub>2</sub>.

Changes in ET-CO<sub>2</sub> are more common in laparoscopic hernia repair because of subcutaneous insufflation of CO<sub>2</sub> which gets accumulated in fat layer and can cause subcutaneous emphysema [1].

Increased ET-CO<sub>2</sub> or hypercarbia results in decrease in cardiac output, increase in arterial BP, increase in systemic vascular resistance and pulmonary vascular resistance (high sympathetic output, hypercoagulability). These changes are mainly predictors of perioperative cardiac morbidity [2]. When considering cardiac patient for surgery, post operative benefits of laparoscopic surgery must be balanced with intraoperative risk involved.

As per scientific literature, this is the first case report of a post-CABG patient operated laparoscopically for subxiphoid incisional hernia repair under general plus epidural anaesthesia.

### Pre Anaesthetic Evaluation

IN A 63 year old male patient with history of hypertension for 12 years, IHD with CABG was done in 2009. Patient has dyspnoea of grade III and chest pain intermittently. Preoperative preparation of the patient included:

- Cardiologist opinion
- 2D Echo – LVEF – 35% type 2 diastolic dysfunction.
- Serum electrolytes and PT INR levels were normal.
- Anti platelet agents were stopped. Beta blocker and isosorbide dinitrate were continued till day of surgery.
- Patient was taken up for surgery after proper explanation of intraoperative risk involved with laparoscopic method with informed high risk consent.

### Intraoperative Management

Patient was sedated with Inj. Fentanyl and Miadozolam. Epidural catheter placed at T8-T9 level to decrease anaesthetic requirement in intraoperative period and for post operative pain relief. Pt. was induced with Propofol and Vecuronium and maintained on Sevoflurane to maintain MAC levels of 1.2 to 1.5 at end tidal concentrations. Before surgical incision, pt. was given 0.25% Bupivacaine through epidural catheter for good analgesia. Controlled ventilation was carried out to maintain PETCO<sub>2</sub> at 30-35. Depth of anaesthesia was monitored by Bispectral index monitor and was kept between 40 and 60. Pt. was extubated at the end of the surgery and was shifted to the SICU.



Fig.1: Incisional hernia seen at subxiphoid region



Fig. 2: BIS Monitor showing intraop .depth of anaesthesia



Fig.3: Maintenance of vital parameters intraoperative phase

### Postoperative Management

- Pt. had consistent hypertension which was treated with intravenous nitroglycerine infusion and continued for one day.
- Pt. developed pulmonary oedema which was efficiently treated with injection Lasix and supportive management.

There were no significant ST-T changes in the ECG. Patient was discharged after 4 days with normal vital parameters.

### DISCUSSION

Successful perioperative evaluation and treatment of cardiac patients undergoing non-cardiac surgery requires team work and communication between patient, cardiologist, surgeon and anaesthesiologist [5].

Mainly risk involved is perioperative myocardial infarction. It is seen immediately within 8 hours after surgery because of

- High sympathetic output
- Hyper coagulability
- Hypertension and tachycardia [5]

It is mainly stress induced ischaemia and not because of plaque rupture or thrombosis. Reason for perioperative ischaemia is mismatch between oxygen supply and demand. Increased demand is because of – tachycardia, hypertension, sympathomimetic drugs, stopping of  $\beta$  blockers. Decreased supply is because of – hypotension, increased intraabdominal pressure [4].

Perioperative myocardial ischemia is usually silent and ST segment depression goes unnoticed. It is necessary to be vigilant and monitor continuous 12 lead ECG mainly V5. In perioperative period it is mandatory to evaluate cardiac functions completely. In laparoscopic surgery risk is involved more because of hypercarbia, increased intra abdominal pressure, and decrease in cardiac output. SvO<sub>2</sub> (mixed venous oxygen concentration) decreases despite preoperative haemodynamic optimization. There is an increase in the after load. In this patient postoperative benefit must be balanced with intraoperative risk involved.

Choice of anaesthesia remains general anaesthesia with endotracheal intubation and controlled ventilation to maintain PETCO<sub>2</sub> between 30-35 mm of Hg. Arterial line for continuous monitoring of blood pressure, transoesophageal echocardiography and continuous ST segment analysis is necessary.

### Precautions

- Slow insufflations of CO<sub>2</sub>
- Low intra abdominal pressure

- Vasodilating drugs like nifedipine, nicardipine to increase SVR.
- Epidural analgesia provided by epidural Bupivacaine helps:
  - To decrease haemodynamic changes
  - To reduce metabolic response
  - To reduce narcotic requirements

BIS monitoring helps in proper maintenance of depth of anaesthesia.

### **CONCLUSION**

Improved knowledge of intraoperative repercussions of laparoscopy permits safe management of patients with severe cardiovascular disease, who may subsequently benefit from the multiple postoperative advantages offered by this technique. General anaesthesia with epidural analgesia is the anaesthesia of the future.

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