CASE REPORT

Anesthetic Management of a Patient with Ischemic Heart Disease for Extended Totally Extraperitoneal Repair under General Anesthesia

Meera Pandey, Riya Divekar

Abstract

A patient with low ejection fraction was posted for laparoscopic repair of hernia by extraperitoneal technique which was successfully done general anesthesia with endotracheal intubation. Arterial line was inserted for beat-to-beat arterial blood pressure monitoring. For pain control bilateral transversus abdominis plane block was given. Perioperative goal is to maintain forward flow, avoid inotropy and returning the cardiac function to normal level without after surgery without inducing ischemia. With thorough preoperative assessment and optimisation and good intraoperative monitoring with management of the fluid status play important role in optimisation of such cases.

Keywords: Anesthesia, ischemia, Dilated Cardiomyopathy.

Journal of Research in Medical and Interpathy Sciences. 3(1);2025 ; doi: 10.61081/jrem/3110

Introduction

Dilated Cardiomyopathy (DCM) is a syndrome characterized by cardiac enlargement and impaired systolic function of one or both ventricles. Anaesthetic management needs to be formulated in patients with left ventricular ejection fraction below 45%.[1–3] Such cases are always a challenge to the anaesthesiologist as they are most complicated by progressive cardiac failure.[4] We report the anaesthetic management of a patient with dilated cardiomyopathy undergoing surgery for extended totally extraperitoneal repair under general anesthesia.

Department of Anaesthesia, SMBT IMS & Research Centre, Maharashtra University of Health Sciences, Nashik, Maharashtra, India

Corresponding Author: Meera Pandey (**Email:** meerapandey8184@gmail.com)

Conflict of Interest: None

Source of Funding: None

How to cite: Pandey M, Divekar R. Anesthetic Management of a Patient with Ischemic Heart Disease for Extended Totally Extraperitoneal Repair under General Anesthesia. Journal of Research in Medical and Interpathy Sciences. 2025;3(1):36–39

Case Report

A 65-year-old Male came to OPD with complaints of swelling in umbilical region for 5 months, per rectal bleed for 15 days, breathlessness NYHA Grade III for 7 days. Patient was a known case of hypertension from the past 2-years; had underwent PTCA 16-years back, currently post CAG 10 days back which was suggestive of Double Vessel Disease- LAD Type III Prox 100% calcified, RCA 80-90%. Patient is currently on cap. Clopidogrel bisulphate + atorvastatin + aspirin 75/10/75 mg HS tab. Nikorandil 5 mg BD, Tab. MetXL 25 mg, Tab. aldactone 25 mg OD. Tab. Ecosprin 150 mg last dose taken 5 days back.

Primarily, the patient was stabilised with oxygen at 4 litre through nasal cannula. Bridging therapy was done, and patient was taken on Inj. Heparin I.V., follow-up 2D echo was done, and EF was 30%. Chest X-ray findings showed haziness in both the lobes and crepts were heard in b/l lower zones on auscultation. Upon further investigation, it was observed that he had mild pleural effusion. After stabilisation in the ICU, patient was examined for preoperative examination.

On examination- BMI-31.2 kg/m^2 obese, BP-144/70 mm of Hg, PR- 102/min, RR-18/min, SPO_2-98% on room air. Systemic examination findings- P/A - Swelling + umbilical region- large umbilical hernia with omental herniation and size of 30 x 23 mm and 2-degree haemorrhoids; RS- AEBE; CVS- S1 S2 +, no murmurs, CNS- conscious oriented. Airway examination mouth opening >2 fingers, mallampatti grade II, metabolic equivalents 2, breath holding time -21 seconds. Blood investigations were within normal range.

USG suggestive of Grade I fatty liver, umbilical hernia with herniation of omentum through a defect of size 30 x 23 mm. ECG suggestive of left fascicular block. 2D-ECHO-EF-30%, ischemic heart disease, status post PTCA, regional wall abnormality seen, no pulmonary hypertension, mild left ventricular dysfunction, Grade I diastolic dysfunction, LAD territory hypokinetic, no clot, IVC collapsible.

In the operating room, all standard monitors were attached to the patient. Baseline vitals were noted. Light sedation was given with 1mg midazolam.

Figure 1: CXR of patient cardiomegaly in DCM.

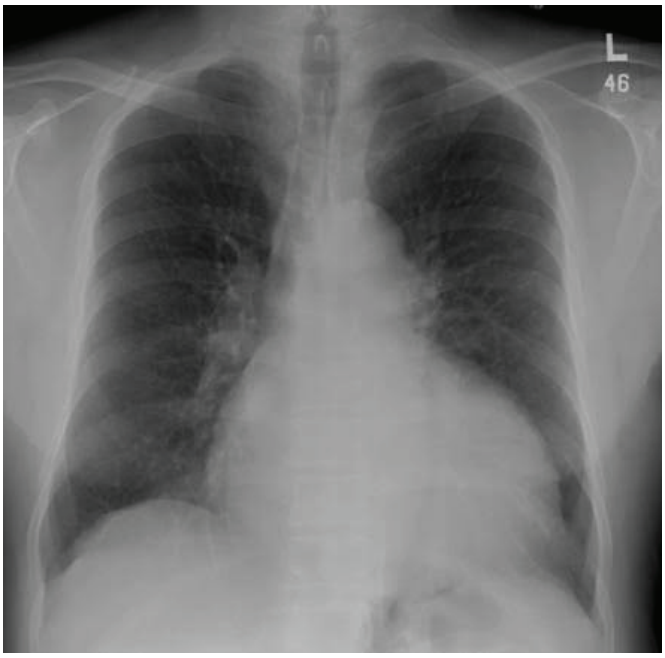

Figure 2: Slow insufflation of gas in abdomen during scopy.

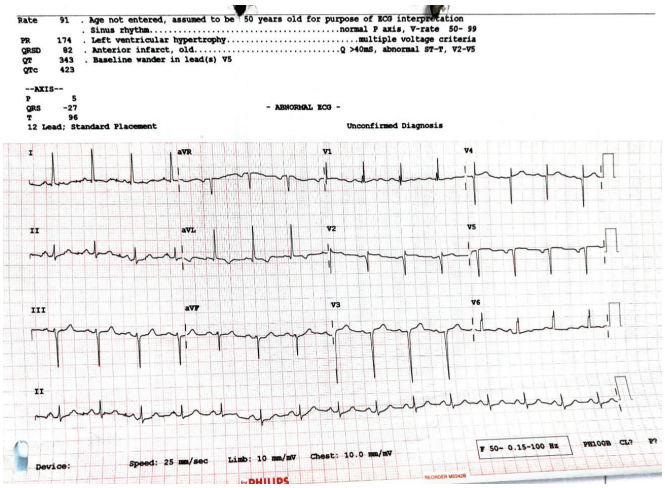

Figure 3: ECG of the patient preoperatively.

Figure 4: Intraoperative monitoring.

Intraoperative arterial line inserted for continuous blood pressure monitoring. Pre-oxygenation was done for 5 min, pre-medication done with Inj. midazolam 2.5 mg, Inj. fentanyl 125 mcg, Inj. glycopyrrolate 0.2 mg and induction done with Inj. etomidate 25 mg, Inj. scoline 75 mg. After direct largyngoscopy patient intubated with 8.0 mmID endotracheal tube, cuff inflated, B/L air entry checked, ETT secured in position at 20 cm. Bilateral Transversus abdominis plane block was given under USG guidance by inplane technique (needle used: B Braun Stimuplex A insulated needle 21 G x100 mm), using Inj. Ropivacaine 0.2% 20 ml on each side + Inj. Dexmedetomidine. Maintenance done with

Figure 5: Tap plane before giving the block.

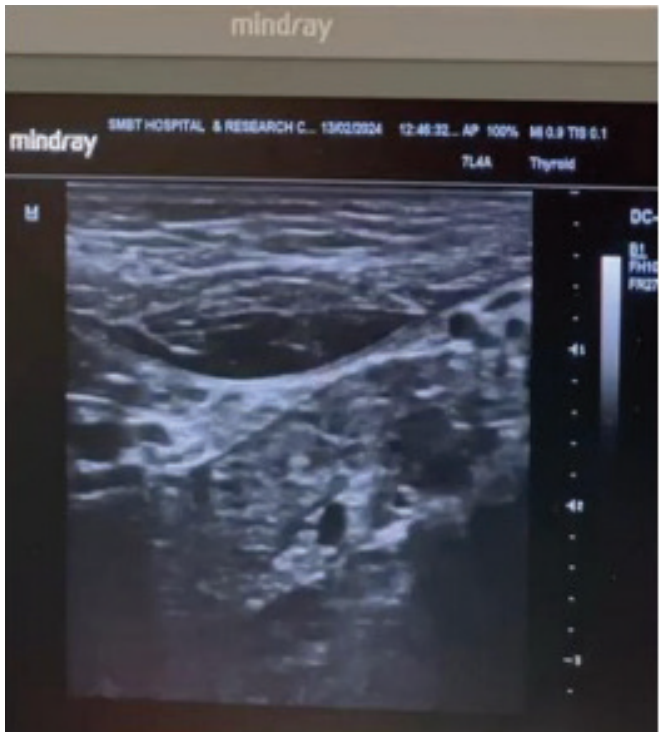

Figure 6: USG guided TAP block.

sevoflurane + and volume control ventilation (TV; 500 mL, I: E-1:2, Freq- 12/min, PEEP-5) + Inj. Cisatracurium 12 mg and later as required. Inj. Nitroglycerine 0.5 mg/cc infusion and Inj. Dexmedetomidine 8.4 mcg/hr infusion given as required. Inj. Furosemide 10 mg given post deflation of abdomen, Inj. dexamethasone 8 mg and ondansetron 4 mg given before extubation. Reversal done with Inj. neostigmine 2.5 mg and glycopyrrolate 0.5 mg after adequate respiratory attempts with adequate tidal volume and extubated after thorough suctioning and good airway reflexes. Patient was vitally stable throughout the procedure.

Discussion

Perioperative anaesthetic management of patients with poor EF is a challenge to the anaesthesiologist, owing to poor left systolic function, ventricular enlargement, risk of malignant arrhythmias and sudden cardiac death. Therefore, these patients require a thorough preoperative assessment and optimisation and intraoperative management.[5] Goals of anaesthesia management: avoid myocardial depression and increase in oxygen demand, maintenance of normovolemia, avoid sudden hypotension when regional anaesthesia is a choice.[6]

So, to significantly decrease the risk of perioperative adverse events, appropriate preoperative assessment, adequate perioperative monitoring, slow insufflation of gas in abdomen during creation of pneumoperitoneum, low flow, low pressure and then gradually the pressure was increased to avoid sudden hemodynamic changes, which are usually accompanied by laparoscopic surgeries.[7] Intraarterial insertion helps in beat-to-beat monitoring of blood pressure and avoid any adverse events.[2]

At lower intra-abdominal pressures of less than 15 mmHg, the venous return is augmented due to the emptying of splanchnic vessels, and thus cardiac output and blood pressure are increased. At higher intra-abdominal pressures of more than 15 mmHg, due to compression of inferior vena cava and other collaterals, the venous return is decreased, thus reducing cardiac output and blood pressure. Various bradyarrythmias can occur which can lead to atrioventricular blocks and cardiac arrest due to vagal stimulation on the insertion of a trocar, peritoneal stretch or carbon dioxide embolization. Use of short acting beta blockers was also done to prevent increase in heart rate and to reduce the myocardial workload.[8] Use of ultrasound guided transversus abdominis plane block helps in analgesia thus reducing the requirement of analgesics for better hemodynamic stability.[9]

Conclusion

We conclude that in patients with ischemic heart disease with low EF, the optimal anaesthetic management of patients requires good preoperative assessment, close perioperative monitoring, using suitable anaesthetic agents, reduced pressor response on intubation, optimization of fluid management, and stable hemodynamic status. Adequate analgesia to avoid pain and tachycardia is also required throughout management in these patients.

References

1. Chua JH, Nguyen R. Anesthetic management of the patient with low ejection fraction. Am J Ther. 2015 Jan-Feb;22(1):73-9. doi: 10.1097/MJT.0b013e31826fc458. PMID: 23344107.

2. Wu YH, Hu L, Xia J, Hao QS, Feng L, Xiang HB. Anaesthetic management of laparoscopic surgery for rectal cancer in patients of dilated cardiomyopathy with poor ejection fraction: a case report. Int J Clin Exp Med. 2015 Jun 15;8(6):9555-9. PMID: 26309623; PMCID: PMC4538102.
3. Kaur, H., Khetarpal, R., & Aggarwal, S. (2013). Dilated cardiomyopathy: an anaesthetic challenge. *Journal of clinical and diagnostic research : JCDR*, *7*(6), 1174–1176. https://doi.org/10.7860/JCDR/2013/5390.3069
4. Smit-Fun V, Buhre WF. The patient with chronic heart failure undergoing surgery. Curr Opin Anaesthesiol. 2016 Jun;29(3):391-6. doi: 10.1097/ACO.0000000000000335. PMID: 26978592.
5. Ryu, T., & Song, S. Y. (2017). Perioperative management of left ventricular diastolic dysfunction and heart failure: an anaesthesiologist's perspective. *Korean journal of anaesthesiology*, *70*(1), 3–12. https://doi.org/10.4097/kjae.2017.70.1.3
6. Ravishankar RB, Vidya NT. Anaesthetic management of ischemic heart disease with ejection fraction of 30 % posted for fracture femur surgery – a case report. J Evid Based Med Healthc 2020;8(19):1453-1455. DOI: 10.18410/jebmh/2021/275
7. Paul Hayden, Sarah Cowman, Anaesthesia for laparoscopic surgery, *Continuing Education in Anaesthesia Critical Care & Pain,* Volume 11, Issue 5, October 2011, Pages 177–180, https://doi.org/10.1093/bjaceaccp/mkr027
8. Karam D, Arora R. Perioperative β-Blockers in Patients Undergoing Noncardiac Surgery Scientific Misconduct and Clinical Guidelines. Am J Ther. 2017 Jul/Aug;24(4):e435-e441. doi: 10.1097/MJT.0000000000000548. PMID: 28092285
9. Khan MJ, Eltayeb Y, Karmakar A, Malik R, Elsafi T. Successful Use of Ultrasound Guided Quadratus Lumborum Block Without General Anesthesia for Open Appendectomy in a Patient with Heart Failure with Reduced Ejection Fraction- A Case Report and Literature Review. Local Reg Anesth. 2024 Feb 23;17:9-17. doi: 10.2147/LRA.S438176. PMID: 38419671; PMCID: PMC10899805.