

Anaesthetic Management of a Patient with Atrial Fibrillation and Post Double Valve Replacement Undergoing Elective Nephrectomy: A Case Report

KSHITIJA DEVENDRA BORA¹, SHEETAL JAYAKAR², SAHIL ARORA³, MANOJ KRISHNA YARLAGADDA⁴

ABSTRACT

The coexistence of Atrial Fibrillation (AF) and a bioprosthetic Double Valve Replacement (DVR) presents a significant perioperative challenge, especially in elderly patients undergoing non cardiac surgery. AF, when associated with a low Ejection Fraction (EF) and anticoagulation therapy, significantly increases the risk of thromboembolism, haemodynamic instability, and arrhythmias during surgery. The perioperative management of a 71-year-old man with persistent AF and prior bioprosthetic DVR, scheduled for left nephrectomy for a non functioning kidney. The case is unique due to the high cardiovascular risk profile, including New York Heart Association (NYHA) class II symptoms, EF of 35%, and chronic anticoagulation therapy. Preoperative evaluation included transthoracic echocardiography and risk stratification using the CHA₂DS₂-VASc score. Antiplatelet therapy was appropriately withheld, and bridging anticoagulation with low molecular weight heparin was administered. Intraoperatively, the patient developed sudden hypotension following lateral positioning, which was promptly managed with vasopressors. Later, the patient developed unstable AF with hypotension requiring synchronised cardioversion. An epidural catheter was placed for analgesia under strict coagulation monitoring, and the procedure was completed successfully with vigilant monitoring. Postoperatively, the patient was electively ventilated, anticoagulation was resumed safely, and sinus rhythm was maintained. He made an uneventful recovery and was discharged on postoperative day 9. This case emphasises the need for individualised anaesthetic strategies, guideline-based anticoagulation management, and interdisciplinary collaboration in high risk cardiac patients undergoing non cardiac surgery. It also highlights the successful perioperative handling of AF and valve prosthesis-related challenges using appropriate scoring systems, monitoring, and intervention protocols.

Keywords: Bioprosthetic valve, Cardiomyopathies, CHA₂DS₂-VASc score, Intraoperative complications, Perioperative management, Risk assessment

CASE REPORT

A 71-year-old male, weighing 80 kg, presented with urinary symptoms for one year. He had NYHA Class II dyspnea and a Metabolic Equivalents of Task (METS) score of 2-3. He had hypertension for seven years and underwent a DVR under general anesthesia seven years ago. Postoperatively, he was anticoagulated with warfarin, later replaced with aspirin and atorvastatin. He was also on digoxin and furosemide. On examination, the pulse was irregularly irregular (56/min), BP 130/80 mmHg. ECG showed AF, left axis deviation, and T-wave inversion. Chest X-ray showed cardiomegaly and signs of pulmonary hypertension. Echocardiography showed EF 35%, a dilated Left Ventricle (LV), moderate concentric Left Ventricular Hypertrophy (LVH), mild Pulmonary Arterial Hypertension (PAH) and functional bioprosthetic mitral and aortic valves. Imaging revealed a non functioning left kidney (left kidney function 2.63%) with obstructive calculus, and prostatomegaly. Left nephrectomy was planned. According to the preoperative evaluation, transthoracic echocardiography and risk stratification using the CHA₂DS₂-VASc score, the patient was classified American Society of Anaesthesiologists (ASA) III and deemed high risk. Aspirin was stopped five days prior; bridging with Low Molecular Weight Heparin (LMWH) (clexane 0.4 mL SC BD) was initiated and stopped 12 hours before surgery. Telmisartan was held on the day of surgery. Digoxin and furosemide were continued. Monitoring included ECG, SpO₂, Non Invasive Blood Pressure (NIBP), capnography, central venous pressure, and an arterial line. Emergency drugs and a defibrillator were kept ready. Epidural catheterisation was performed at the L2-L3 interspace.

Anesthesia was induced with IV midazolam (0.02 mg/kg), fentanyl (2 mcg/kg), ondansetron (0.1 mg/kg), etomidate (0.3 mg/kg), and vecuronium (0.1 mg/kg). Intubation was performed with an 8.5 mm cuffed oral tube. Epidural analgesia consisted of 0.125% bupivacaine (10 mL) and morphine (3 mg). Anesthesia was maintained with oxygen:nitrous oxide (50:50), sevoflurane (MAC 1.0-1.2), and intermittent vecuronium. After lateral positioning, hypotension (BP 60/30 mmHg) developed and was managed with IV noradrenaline (0.05 mcg/kg/min) and adrenaline (0.1 mcg/kg/min). The surgery lasted four hours, during which the patient received a total fluid input of 2000 mL (comprising 1500 mL crystalloids and 500 mL colloid), with an estimated blood loss of 100 mL and a urine output of 450 mL.

Postoperative course: after repositioning to supine, the patient developed unstable AF (rate 180-200/min) with hypotension. Synchronous cardioversion (150 J) restored sinus rhythm. He was electively ventilated and extubated on postoperative day 1. The epidural was removed, LMWH (0.6 mL SC BD) restarted, and transitioned to oral acenocoumarol. ECGs showed stable rhythm and repeat echocardiography showed stable function. He was shifted to the ward on postoperative day 5 and discharged on postoperative day 9 following cardiology review.

DISCUSSION

The AF in a patient with bioprosthetic valves, low EF and advanced age presents a high risk of perioperative thromboembolism, arrhythmia, and haemodynamic compromise. The CHA₂DS₂-VASc score of five confirmed the need for bridging anticoagulation

in accordance with the 2017 European Society of Cardiology (ESC)/ European Association for Cardio-Thoracic Surgery (EACTS) guidelines and current perioperative AF management strategies [1-3]. LMWH was appropriately withheld preoperatively to balance the bleeding risk. Etomidate and vecuronium were chosen for their cardiovascular stability in patients with compromised cardiac function [4,5]. Intraoperative hypotension was likely due to venous pooling and preload reduction upon lateral positioning and was effectively managed with vasopressors. Epidural placement was justified following International Normalised Ratio (INR) normalisation, and vigilant monitoring ensured safety. The intraoperative AF episode was recognised early and successfully cardioverted, aligning with standard protocols in patients with heart failure and reduced EF [6]. Multidisciplinary input, optimised fluid strategy, and planned Invasive Care Unit (ICU) monitoring contributed to the favourable outcome. This case reinforces the importance of guideline-based anticoagulation, risk stratification, and individualised anaesthetic planning in high risk cardiac patients undergoing non-cardiac surgery [7].

Previous literature has documented successful perioperative management of patients with prosthetic valves and AF undergoing non-cardiac surgery, with emphasis on anticoagulation bridging, haemodynamic monitoring, and the safe use of neuraxial techniques under controlled coagulation; however, reports involving the combination of bioprosthetic DVR, persistent AF, reduced EF, and non-cardiac surgery remain extremely limited, making such presentations rare and scarcely documented [8,9].

CONCLUSION(S)

This case highlights the successful perioperative management of a high risk elderly patient with AF and bioprosthetic DVR undergoing non-cardiac surgery. It underscores the importance of tailored anaesthetic strategies, meticulous haemodynamic monitoring, and

proactive arrhythmia management in patients with compromised cardiac function. The use of evidence-based risk stratification tools like the CHA₂DS₂-VASc score and adherence to guideline-directed anticoagulation protocols were pivotal in minimising complications. Early recognition and prompt treatment of intraoperative hypotension and unstable AF, along with a multidisciplinary approach, contributed to a favourable outcome. This case reinforces the critical role of preoperative planning and interdisciplinary coordination in ensuring safety during surgery in complex cardiac patients, thereby improving outcomes in high risk patients.

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PARTICULARS OF CONTRIBUTORS:

1. Resident, Department of Anaesthesiology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pune, Maharashtra, India.
2. Professor, Department of Anaesthesiology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pune, Maharashtra, India.
3. Resident, Department of Anaesthesiology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pune, Maharashtra, India.
4. Resident, Department of Anaesthesiology, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pune, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Kshitija Devendra Bora,
Department of Anaesthesiology, 5th Floor, Hi-Tech Building, Dr. D. Y. Patil Medical College, Hospital and Research Centre, Sant Tukaram Nagar, Pune, Maharashtra, India.
E-mail: kbora0406@gmail.com

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