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Anaesthetic Odyssey: Tackling CABG complications with a multidisciplinary manoeuvre

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ABSTRACT:
This case report explores the intricate challenges of anaesthetic management in a 62-year-old male patient with post-Coronary Artery Bypass Grafting (CABG) having sternal wound dehiscence and severe chest infection. The patient presented with significant cardiac comorbidities, including severe left ventricular dysfunction (LV dysfunction) and moderate mitral regurgitation, complicating perioperative care. Hemodynamic instability, respiratory compromise, and metabolic abnormalities further complicated management. Utilizing a multidisciplinary approach, including thoracic epidural anaesthesia for intraoperative analgesia, the patient achieved stable postoperative outcomes. The case highlights the importance of tailored perioperative strategies and collaborative care in optimizing outcomes for high-risk surgical patients.

Keywords: Coronary Artery Bypass Grafting (CABG), Sternal wound dehiscence, Left ventricular dysfunction, Anaesthetic management, Thoracic epidural anaesthesia, Multidisciplinary approach

I. INTRODUCTION:

Complications following Coronary Artery Bypass Grafting (CABG), particularly sternal wound dehiscence, present significant challenges in perioperative management. This case report aims to delve into the intricate landscape of anaesthetic challenges encountered in a patient with sternal wound dehiscence following CABG.

Anaesthetic management in patients with poor ejection fraction,grossly deranged hepato-renal parameters and chest infections following CABG necessitates a multidisciplinary approach. These patients present unique challenges, including hemodynamic instability, respiratory compromise, increased susceptibility to infection and intra op morbidity. Achieving optimal perioperative outcomes requires close collaboration among cardiac surgeons, anaesthesiologists, microbiologists, and other healthcare professionals.Cardiac and respiratory disorders and autonomic dysfunction seem to occur more frequently in older people.Unfortunately, this circumstance limits choosing anaesthetic methods for these patients. After detailed evaluation planned for Epidural anaesthesia or analgesia which can decrease the potential complications due to general anaesthesia such as prolonged post op ventilation, myocardial depression and prolonged ileus.

This report will focus on the specific anaesthetic challenges encountered in patients with poor ejection fraction, grossly deranged hepatic&renal parametersand chest infections following CABG,repeated hyponatremia despite giving injectable corrections, shedding light on the complexities of perioperative care in this population. By elucidating these challenges, we aim to enhance understanding and promote tailored approaches to optimize patient outcomes in such cases.

II. CASE PRESENTATION:

A 62-year-old male underwent Coronary Artery Bypass Grafting (CABG) surgery at a private hospital two months ago, subsequently diagnosed with post-CABG sternal wound dehiscence and severe chest infection, highlighting the complex challenges in perioperative management. His medical history included significant coronary artery disease, severe left ventricular dysfunction with an ejection fraction of 20%, global hypokinesia, and moderate mitral regurgitation. Following CABG, he experienced persistent respiratory distress, leading to admission to the Intensive Care Unit (ICU) and eventual transfer to another facility due to ongoing desaturation and hypotension. Further evaluation revealed severe Left Ventricular (LV) dysfunction, moderate tricuspid regurgitation, and mild pulmonary hypertension. Upon presentation for debridement and Vacuum-Assisted Closure (VAC) dressing, the patient encountered several anesthetic

challenges. Hemodynamic instability, attributed to LV dysfunction and hypotension, necessitated the initiation of inotropic support with noradrenaline to optimize perfusion. Respiratory compromise, indicated by bilateral crepitations, required meticulous ventilation strategies to ensure adequate oxygenation. Additionally, grossly deranged hepato-renal parameters, including a serum creatinine value of 2.8mg/dl and blood urea of 166, alongside metabolic abnormalities such as repeated hyponatremia and metabolic alkalosis, required careful correction to prevent adverse effects on cardiac function and electrolyte balance.

The management approach involved thoracic epidural anesthesia for intraoperative analgesia, tailored to the patient's comorbidities and postoperative pain control needs. Prior to surgery, the patient fasted for six hours and received premedication with intravenous Ondansetron 4mg and intravenous Pantoprazole 40 mg. Routine monitors were connected, and an 18 G peripheral intravenous access was secured, initiating preloading of isotonic solution at 4ml/kg/hr. Under aseptic precautions, an epidural catheter was inserted between T4 and T5 intervertebral spaces with a loss of resistance method in the sitting position. The catheter tip was positioned 3 cm cephalic, and a test dose of 3 ml of 2% Lidocaine with adrenaline was injected to confirm the catheter's position. Subsequently, 08 ml Inj. Bupivacain 0.25% + 50 mcg fentanyl were injected through the epidural catheter. Adequate sensory blockage was achieved between T3 and T8 spaces 10 minutes after epidural anesthesia. Oxygen was administered at 6 lt/min via a face mask, and the surgical procedure commenced with the patient in a supine position using standard aseptic technique. During surgery, blood pressure ranged between 112/68mmHg and 96/54 mmHg, heart rates between 56-114 per min, and oxygen saturations between 89-96%. Approximately 15 minutes after epidural anesthesia, a transient hypotensive episode occurred, with a blood pressure of 76/44mmHg and mean arterial pressure(MAP)56 mmHg, prompting intravenous administration of 6mg mephenterine. An additional dose of 06 ml Inj. Bupivacaine 0.25% + inj. Dexamethasone 4mg was given as a top-up through the epidural catheter after 01 hour and 15 minutes, resulting in hemodynamic stability. A total of 400ml of Normal Saline was administered intravenously during the intraoperative period, with a total surgical time of 02 hours 08 minutes.Through a multidisciplinary approach and vigilant monitoring, the patient achieved stable postoperative outcomes, demonstrating improved clinical status and resolution of respiratory symptoms.

III. DISCUSSION

In discussing the presented case, it becomes evident that the multifaceted challenges in anaesthetic management underscore the imperative of a collaborative and multidisciplinary approach. Elderly patients with pre-existing cardiac and respiratory comorbidities, as evidenced in this case, require tailored perioperative strategies to mitigate risks and optimize outcomes.

The case illustrates the significant impact of pre-existing cardiac comorbidities, such as severe left ventricular dysfunction and moderate mitral regurgitation, on perioperative outcomes. Hemodynamic instability, respiratory compromise, metabolic abnormalities along with hepato-renal abnormalities further compounded the challenges in achieving optimal perioperative management. In this context, careful consideration of anaesthetic techniques and perioperative interventions tailored to the individual patient's clinical profile is paramount. One key aspect of perioperative care highlighted in this case is the role of thoracic epidural anaesthesia in providing effective intraoperative analgesia while minimizing systemic opioid use and its associated adverse effects. This approach, although beneficial for pain management, requires careful titration and vigilant monitoring, especially in patients with hemodynamic instability and electrolyte disturbances. Furthermore, the successful resolution of respiratory symptoms and stable postoperative outcomes achieved in this case underscore the importance of meticulous perioperative monitoring and management. Close attention to fluid and electrolyte balance, optimization of ventilation strategies, and judicious use of inotropic support are critical elements in mitigating perioperative risks and ensuring favourable outcomes.

Epidural anaesthesia emerges as a valuable tool in this context, offering effective analgesia while minimizing systemic opioid-related complications. Studies such as those by Arik et al.[1] (2012) and Niimi et al.[2] (1997) have underscored the favourable hemodynamic effects of thoracic epidural anaesthesia, particularly in patients with compromised ejection fraction, autonomic dysfunction and grossly deranged hepatic & renal parameters. Additionally, Clemente and Carli[3] (2008) emphasized the beneficial impact of thoracic epidural anaesthesia on cardiovascular, respiratory, and gastrointestinal function, further supporting its utility in high-risk cardiac patients.

Notably, Bakhtiary et al.[4] (2007) demonstrated a potential reduction in perioperative atrial fibrillation incidence with high thoracic epidural anaesthesia, highlighting its broader implications in cardiac surgical care.

In this case, the successful utilization of epidural anaesthesia facilitated intraoperative hemodynamic stability and effective pain management, despite the patient's complex clinical presentation. However, vigilance is paramount, as evidenced by the transient hypotensive episode requiring prompt intervention. The collaborative efforts of the multidisciplinary team, including cardiac surgeons, anaesthesiologists, and microbiologists, played a pivotal role in navigating the challenges posed by post-CABG sternal wound dehiscence and chest infection. Table 1 highlights anesthetic challenges and management strategies related to present case. Through meticulous perioperative monitoring and tailored interventions, the patient achieved stable postoperative outcomes, emphasizing the critical importance of individualized management in high-risk surgical populations

IV. CONCLUSION:

Anaesthetic management in patients with poor ejection fraction, chest infection and grossly deranged hepatic & renal parametersfollowing CABG requires a multidisciplinary approach. Close perioperative monitoring, meticulous surgical technique, and tailored anaesthetic strategies are essential for optimizing outcomes in these high-risk patients. This case underscores the importance of collaborative care and individualized management in achieving successful perioperative outcomes.

REFERENCES:

[1]. Arik H, Erhan OL, Beştas A, et al. The effect of a single or fractional dose of local anaesthetic on hemodynamic in epidural anaesthesia evaluated according to ejection fraction. Turk J Geriatr. 2012; 15:439-44.

[2]. Niimi Y, Ichinose F, Saegusa H, et al. Echocardiographic evaluation of global left ventricular function during high thoracic epidural anaesthesia. J Clin Anesth. 1997; 9:118-24.

[3]. Clemente A, Carli F. The physiological effects of thoracic epidural anesthesia and analgesia on the cardiovascular, respiratory and gastrointestinal systems. Minerva Anestesiol. 2008; 74:549-63.

[4]. Bakhtiary F, Therapidis P, Dzemali O, Ak K, Ackermann H, Meininger D, Kessler P, Kleine P, Moritz A, Aybek T, Dogan S. Impact of high thoracic epidural anaesthesia on incidence of perioperative atrial fibrillation in off-pump coronary bypass grafting: a prospective randomized study. J Thorac Cardiovasc Surg. 2007 Aug;134(2):460-4. doi: 10.1016/j.jtcvs.2007.03.043. PMID: 17662790.

Table 1: Anesthetic Challenges and Management Strategies

Anesthetic Challenges	Management Strategies
Hemodynamic instability	- Initiation of inotropic support (e.g., noradrenaline) to optimize perfusion
	- Close hemodynamic monitoring to assess response to therapy and adjust medication as needed
Respiratory compromise	- Meticulous ventilation strategies to ensure adequate oxygenation
	- Utilization of thoracic epidural anesthesia for intraoperative analgesia, minimizing systemic opioid use and associated respiratory depression
	- Vigilant monitoring for signs of respiratory distress and prompt intervention as necessary
Metabolic abnormalities (e.g., hyponatremia, alkalosis)	- Correction of metabolic imbalances to prevent adverse effects on cardiac function and electrolyte balance
	- Close monitoring of electrolyte levels and acid-base status, with appropriate adjustments in fluid and medication management as indicated

Infection susceptibility	- Timely administration of appropriate antibiotics based on culture and sensitivity results
	- Implementation of infection control measures to minimize the risk of nosocomial infections
Multidisciplinary coordination	- Close collaboration among cardiac surgeons, anaesthesiologists, microbiologists, and other healthcare professionals to address the complex clinical needs
	- Regular interdisciplinary team meetings to discuss patient progress, adjust management plans, and ensure continuity of care