

A Fallot feat : When the shunted heart meets the obstructed abdomen.

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Tetralogy of Fallot (TOF) remains the most prevalent cyanotic congenital heart disease, typically requiring early surgical correction to enable survival into adulthood. Despite successful repair, adult patients may still harbour residual structural or functional anomalies that significantly complicate anaesthetic management. Emergency non-cardiac procedures, introduce unique perioperative risks including abrupt hemodynamic instability, hypoxia, and arrhythmias.

The interplay between altered cardiovascular physiology and surgical stress mandates vigilant perioperative planning. A multidisciplinary, individualized anaesthetic approach is essential to mitigate complications and ensure hemodynamic stability in this high-risk population.

Keywords: Tetralogy of Fallot, General Anaesthesia, Emergency Treatment, Inguinal Hernia, Multidisciplinary Communication

Case Report

36- year-old male with surgically corrected TOF , with no recent history of cyanosis presented with left side lower abdominal pain of 2 days duration associated with multiple episodes of nausea and vomiting. He was diagnosed with LEFT OBSTRUCTED INGUINAL HERNIA.

PRE-ANAESTHETIC EVALUATION

On general examination, the patient was conscious and oriented. He weighed 36 kg with a BMI of 17 kg/m². Grade II clubbing was noted, and there was

no cyanosis. The pulse rate was 74 beats per minute and regular, and the non-invasive blood pressure was 120/90 mmHg. A differential saturation was observed between the limbs. A systolic murmur was heard on auscultation. On local examination, a swelling measuring approximately 10 × 15 cm was noted in the left inguinal region.

GRADE II CLUBBING

Airway assessment revealed no facial dysmorphism. The Modified Mallampatti classification was Class II. Investigations revealed polycythemia, leukocytosis, a low-normal platelet count, and a deranged coagulation profile with a PT of 61.45

seconds and an INR of 7.46. Chest X-ray showed increased bronchovascular markings, scoliosis, and cardiomegaly. ECG demonstrated sinus rhythm at 84 bpm, P pulmonale, right ventricular hypertrophy, and inverted T waves in leads V1 to V3. Echocardiography revealed Tetralogy of Fallot with pulmonary atresia, dilated left and right atria, a large cono-ventricular VSD, BT shunt flow present, and fair left ventricular function with an ejection fraction of 50%. Ultrasound abdomen showed a left inguinoscrotal hernia with dilated, fluid-filled bowel loops suggestive of possible obstruction



Anaesthetic Goals

- Ø Decrease PVR, Maintain SVR , Maintain central volume
- Ø Higher FiO₂ , Maintain normal FRC
- Ø Avoid acidosis/hypercarbia/hypothermia/high inspiratory pressures/PEEP/endobronchial intubation
- Ø Avoid adrenergic surge -deep intubation and extubation

Anaesthetic Management

SMALL BOWEL RESECTION ANASTOMOSIS WITH HERNIORRHAPHY UNDER GENERAL ANAESTHESIA WITH ENDOTRACHEAL INTUBATION AND CONTROLLED VENTILATION

(Written informed and high risk consent obtained)
The patient was shifted to the operating theatre after

receiving four units of fresh frozen plasma transfusion and subacute bacterial endocarditis (SBE) prophylaxis. Standard monitors were attached, and baseline vitals were recorded. A Ryle's tube was in situ and suctioned. Premedication was given with intravenous glycopyrrolate 0.08 mg (to avoid tachycardia), midazolam 0.5 mg, and morphine 3 mg. Oxygen was started via nasal prongs at 3 L/min. An arterial line was inserted in the left radial artery under local anesthesia and strict aseptic precautions, and a baseline ABG sample was sent. Preoxygenation was done with 100% oxygen at 8 L/min. Induction was achieved with intravenous fentanyl 30 mcg, ketamine 30 mg, lignocaine 20 mg, and etomidate 4 mg. Bag-mask ventilation was adequate. Neuromuscular blockade was facilitated with intravenous succinylcholine 75 mg and lignocaine 20 mg. Intubation was performed using a 7.5 mm ID cuffed endotracheal tube. Tube placement was confirmed by chest rise, five-point auscultation, and capnography (ETCO₂), and it was secured at 19 cm. Intravenous vecuronium 3 mg was administered for neuromuscular blockade.

Anesthesia was maintained with oxygen and air in a ratio of 4:2. Nitrous oxide was deliberately avoided. IPPV was continued using a circle system, and isoflurane was used at 0.6%. Dexmedetomidine infusion (1 mcg/cc) was started at 15 mcg/hr and titrated accordingly. Phenylephrine infusion (10 mcg/cc) was started at 60 mcg/hr and adjusted to maintain stable blood pressure. Intravenous hydrocortisone 50 mg was administered. Additional analgesia was provided with intravenous fentanyl 10 + 10 mcg and intravenous paracetamol 300 mg. Since neuraxial block was contraindicated, a 12.5 mcg fentanyl patch was applied for postoperative analgesia. Intravenous vecuronium was repeated as required. Intravenous emeset 4 mg was given. Local infiltration was done with 0.5% opivacaine and dexmedetomidine 25 mcg. ABG was repeated intraoperatively. Reversal of neuromuscular blockade was achieved with intravenous sugammadex 120 mg. The patient was extubated after thorough oral suctioning and cuff deflation. As the patient required a high FiO₂ to be delivered steadily, she was shifted to the SICU on a Venturi mask with oxygen at 15 L/min.

DISCUSSION

Tetralogy of Fallot (TOF), the most common congenital cyanotic heart disease, poses considerable anaesthetic challenges even after surgical correction. Despite successful repair, patients may have residual defects such as pulmonary atresia, right ventricular hypertrophy, and persistent shunt sited meticulous hemodynamic management. flow, all of which can affect perioperative outcomes during non-cardiac surgeries. Emergency abdominal surgeries further amplify risk due to limited time for optimization, potential for fluid shifts, blood loss, and heightened sympathetic response. This neces

Anaesthetic induction using etomidate and ketamine along with maintenance using dexmedetomidine and phenylephrine helped preserve systemic vascular resistance (SVR) and minimize right ventricular strain. Strategies to decrease pulmonary vascular resistance (PVR) including the use of high FiO₂, maintenance of normothermia, and avoidance of acidosis and hypercarbia were rigorously followed.

The intraoperative course remained stable, and the patient was successfully extubated and transferred to SICU. SpO₂ levels persistently remained low (75-80%) and cardiologist opined that it was adequate for a post shunt patient. Patient was weaned off supplemental oxygen with gradual tapering of FiO₂, shifted to face mask and ultimately maintained on room air.

CONCLUSION

This case highlights the critical role of individualized anaesthetic strategies and cohesive multidisciplinary collaboration in optimizing outcomes for adults with repaired congenital heart disease undergoing emergency non-cardiac surgery. Meticulous perioperative planning addressing residual hemodynamic vulnerabilities and oxygenation issues was key to ensuring intraoperative stability and an uncomplicated recovery, despite the urgency and complexity involved.

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