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Case Report

Total Correction of Tetralogy of Fallot with Large ASD in a Child with Laryngomalacia and Microcephaly: A Case Report

Taufiq Gemawan[1,2]*, Fajar Perdana[1,2]

[1]Departement of Anesthesiology and Reanimation, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

[2]Dr.Soetomo General Academic Hospital, Surabaya, Indonesia.

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ABSTRACT

Tetralogy of Fallot (TOF) is becoming the most common cyanotic congenital heart disease, so there are many considerations for anesthesia and perioperative management, and also comorbidities such as laryngomalacia and microcephaly make its management quite challenging. This case report describes the perioperative and intensive care management of a patient undergoing total correction of TOF with a large ASD, complicated by postoperative atelectasis, pneumonia, and ventricular tachyarrhythmia. A 1-year-11-month-old boy with a weight of 10.2 kg was diagnosed with TOF + large secundum ASD, with a history of cyanotic spells, malnutrition, and laryngomalacia. Baseline SpO_2 was 85% on room air, and echocardiography shows severe infundibular pulmonary stenosis (PG 94 mmHg). The patient underwent total correction, including pulmonary valve-sparing infundibulectomy, patch closure of VSD and ASD, and tricuspid commissuroplasty, with intraoperative TEE monitoring. He developed ventricular tachycardia after cross-clamp removal, successfully treated with DC shock and amiodarone infusion. Postoperatively, he required prolonged mechanical ventilation and reintubation due to atelectasis and nosocomial pneumonia. This case highlights the importance of meticulous hemodynamic and airway management in TOF with comorbidities. Multidisciplinary care, intraoperative TEE guidance, and early recognition of postoperative complications contributed to a favorable outcome.

Introduction

With a frequency of 1 in 3600 live births, tetralogy of Fallot (TOF) makes up roughly 3–5% of all congenital cardiac disorders. When anatomy permits, early full repair is ideal, typically before one year of age [1-3]. Anesthesia approach, ventilator weaning, and neurologic recovery are all impacted by the increased perioperative difficulty caused by big ASD, laryngomalacia, and microcephaly. This case is special since it shows complete recovery in a youngster who had several comorbidities and needed respiratory and critical care for a long time.

Case Report

A 1-year-11-month-old male (10.2 kg, 80 cm) exhibited cyanotic episodes, failure to thrive, and a history of recurrent upper airway obstruction attributed to laryngomalacia. Upon examination, the SpO_2 level was recorded at 85% in room air, a systolic murmur was auscultated, and digital clubbing was observed. Echocardiography indicated the presence of tetralogy of Fallot (TOF) accompanied by a large perimembranous

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*Corresponding author.
E-mail address: topx.md@gmail.com
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ventricular septal defect (VSD) measuring 1.3 cm, a large secundum atrial septal defect (ASD), and severe infundibular pulmonary stenosis with a pressure gradient of 94 mmHg, alongside normal coronary anatomy. Cardiac catheterization revealed a McGoon ratio of 3.03, signifying sufficient pulmonary arteries for total correction.

The surgical procedures included tricuspid commissuroplasty, VSD and ASD closure with patch, and infundibulectomy. The patient experienced ventricular tachycardia following the removal of the cross-clamp, which was treated with intravenous amiodarone and DC shock. Intraoperative TEE decreased the RVOT gradient to 19.9 mmHg and verified that there was no residual VSD or ASD.

The patient needed mechanical ventilation after surgery. After an initial attempt at extubation, he developed left lung atelectasis and was reintubated because of Acinetobacter baumannii-caused pneumonia and increased respiratory distress. He was successfully extubated on day six and moved to the ward on day seven following targeted antibiotic treatment and gradual weaning.

The patient achieved complete anatomic correction with significant reduction of RVOT gradient. Postoperative complications, including VT, atelectasis, and nosocomial pneumonia, were managed successfully. The patient was discharged from the ICU in stable hemodynamic and respiratory condition.

Discussion

The anesthesia and critical care difficulties faced by TOF with numerous comorbidities are highlighted in this case. Suitability for primary repair was indicated by a McGoon ratio greater than 2.5. To evaluate surgical outcomes and identify lingering lesions in real time, intraoperative TEE proved essential. Laryngomalacia raised the likelihood of post-extubation failure; hence, careful ventilator weaning and being prepared for reintubation were necessary. After RVOT resection, post-bypass VT is a recognized consequence that was rapidly treated with amiodarone and DC shock to stop further hemodynamic deterioration [4].

Recovery was eventually achieved by adequate antibiotic therapy and aggressive management of pulmonary problems. In order to obtain positive results in complicated TOF situations, this example highlights the importance of a multidisciplinary strategy that combines surgical precision, sophisticated monitoring, and evidence-based ICU management [5-7].

Conclusion

With careful preoperative planning, thorough intraoperative monitoring, and timely management of postoperative problems, a child with laryngomalacia and microcephaly can have a positive outcome after total correction of TOF with substantial ASD.

References

[1] Apitz C, Webb GD, Redington AN. Tetralogy of Fallot. Lancet. 2009; 374(9699):1462-71.

[2] Townsley MM, Windsor J, Briston D, Alegria J, Ramakrishna H. Tetralogy of Fallot: Perioperative Management and Analysis of Outcomes. J Cardiothorac Vasc Anesth. 2019; 33(2):556-565.

[3] Andropoulos DB, Stayer SA, Mossad EB, Miller-Hance WC, editors. Anesthesia for Congenital Heart Disease. 3rd ed. Wiley-Blackwell; 2016.

[4] Yang J, Brunnquell M, Liang JJ, Callans DJ, Garcia FC, Lin D, et al. Long term follow-up after ventricular tachycardia ablation in patients with congenital heart disease. J Cardiovasc Electrophysiol. 2019; 30(9):1560-1568.

[5] Alotaibi RK, Saleem AS, Alsharef FF, Alnemer ZA, Saber YM, Abdelmohsen GA, et al. Risk factors of early postoperative cardiac arrhythmia after pediatric cardiac surgery: A single-center experience. Saudi Med J. 2022; 43(10):1111-1119.

[6] Akimoto Y, Bando N, Sato H, Sato K, Momota K, Nunomura T, et al. Acquired laryngomalacia as a cause of post-extubation respiratory failure in patient with postoperative seizure and central pontine myelinolysis after craniotomy. J Med Invest. 2022; 69(3.4):316-319.

[7] Tsivitis A, Wang A, Murphy J, Khan A, Jin Z, Moore R, et al. Anesthesia, the developing brain, and dexmedetomidine for neuroprotection. Front Neurol. 2023; 14:1150135.