

## Anesthetic Management of a Patient with Tetralogy of Fallot for Cesarean Section

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### ABSTRACT

Tetralogy of Fallot is one of the frequently encountered cyanotic heart diseases. We describe how we handled anesthesia for a pregnant woman with uncorrected Tetralogy of Fallot during a cesarean section. Less than 10% of patients with Congenital Heart Disease survive for more than 10 years. Among the survivors, very few of them reach adulthood in countries like Pakistan with no previous surgical interventions. The occurrence of such case is quite rare.

**Keywords:** Anesthetic management, Cesarean section, Tetralogy of fallot.

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### INTRODUCTION

Tetralogy of Fallot (TOF) is the most frequently seen cyanotic heart condition in children. It makes up to 7-10% of birth defects, impacting both gender equally, with 3-5 out of every 10,000 live births.<sup>1</sup> A cyanotic heart condition that isn't fixed poses a big danger during pregnancy for both the mother and the baby. It is very rare that female with TOF without surgery grow up, get married and report for cesarean section. In our setup, we report a case of 30 years old lady with uncorrected TOF successfully handled under general anesthesia for cesarean section.

### CASE REPORT

A 30 years old lady, G<sub>1</sub>P<sub>0</sub>, at 36 weeks gestation was admitted in obstetric ward for elective cesarean section. The patient had a congenital heart condition from birth that had not been fixed. She had complaint of breathlessness on routine work. She had no previous anesthetic history.

On examination, she had central and peripheral cyanosis and clubbing (Figure-1). Her pulse was 99 bpm, and her blood pressure was 109 /71 mmHg. Her SpO<sub>2</sub> on room air was 85%. Pedal edema was noted. Upon cardiovascular examination, pan-systolic murmur was found. Rest of the examination was insignificant. Her hemoglobin was 16g/dL. Her echocardiography showed large peri-membranous Ventricular Septal Defect (VSD) with overriding of aorta, severe Right Ventricular Outflow Tract (RVOT) obstruction, hypertrophied right ventricle with good systolic function and dilated right atrium. Normal sized Inferior Vena Cava (IVC) with >50% inspiratory

collapse.(Figure-2)



Figure-1 Peripheral Cyanosis and Clubbing

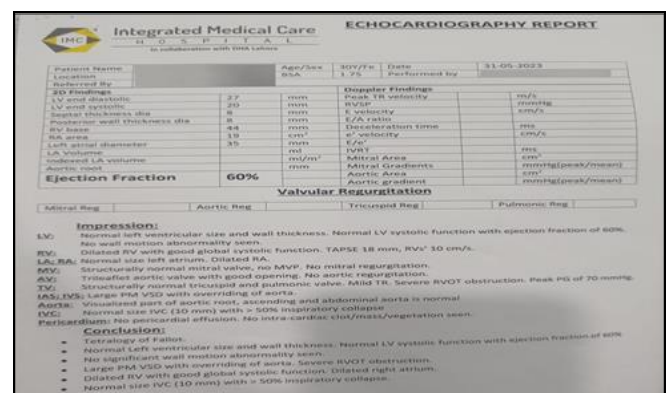


Figure-2 Echocardiography Findings

After taking cardiologist consultation, she was proceeded for surgery. High risk consent was taken. On operation table, her SpO<sub>2</sub> was 82%. A central venous line was placed in the right jugular vein and a right radial arterial line was inserted under local anesthesia with sterile precautions. Meanwhile, the patient was loaded with 500 ml lactated Ringer

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solution. After pre-oxygenation, patient was given 0.2 mg Glycopyrolate intravenously, induced with 60 mg of Ketamine, 100 mg of Succinylcholine and then the patient was intubated. Isoflurane was started on 0.8 MAC, IV Atracurium was administered and 100% oxygen was given till the delivery of the baby. After delivery, it was decrease to 50% and 3 mg IV Nalbin was given as an analgesic. IV Syntocinon 3 mg was given for uterine contraction. 0.05 mcg/kg/min of Norepinephrine infusion which was started during induction, was continued till emergence. Hemodynamics remained stable and oxygen saturation was maintained between 90-93% throughout the case. After surgery, Atracurium was reversed by 2.5 mg Neostigmine and 0.5mg of Glycopyrolate and patient was extubated once she was fully awake. Norepinephrine infusion was stopped after emergence. There were no cyanotic spells or hemodynamic changes. The patient was shifted to ICU for closed monitoring. Her post-operative duration was uneventful and she was discharged on the fifth day with a recommendation to undergo TOF repair surgery.

### DISCUSSION

TOF is a serious type of congenital heart disease with cardiac changes because of certain anatomic abnormalities such as dysfunction in ventricles, right ventricular systolic dysfunction with hypertrophy and blockages in outflow tract.<sup>2</sup> After fixing TOF through surgery, most young women can live on to have children. However, heart diseases are a major cause of maternal deaths.<sup>3</sup>

With the new and improved ways of diagnosing and treating TOF, the overall outlook for patients has got much better over the years. However, we occasionally encountered uncorrected TOF in pregnant women. Because pregnancy leads to immense cardiac load, women who don't have TOF repair leads to increase in morbidity during maternal and perinatal period as compared to the general population. These cases are rare. Therefore, there is, no standard regime for management of these patients. The condition of the mother and the risk of death significantly impact the fetal outcome in patients with CHD.<sup>5</sup> A recent study by Ramage and his colleagues described 2114 births to women with CHD and found a link between neonatal or maternal adverse outcomes in CHD cases. Their findings revealed that tendency of baby birth before 37 weeks were 1.4 times more likely in women with CHD. Women with CHD also had a tendency to give birth before 32 weeks i.e. preterm. Additionally,

12.8% of women with CHD gave birth to a baby who had intrauterine growth retardation.<sup>6</sup>

Due to increase risk of complications, it might be safer for women with heart conditions to have a C-section instead of a prolonged labor.<sup>7</sup> Women who are prone to arrhythmias are at risk for their reappearance in pregnancy and labor.<sup>8</sup> Interdisciplinary management by the cardiologist, anesthesiologist, neonatologist and obstetrician may improve the prognosis.<sup>9,10</sup>

Our aim during anesthesia was to give judicious fluid to the patient, to avoid reduction in afterload, to maintain the systemic and the peripheral vascular resistance and to prevent right to left shunt. We induced the patient with ketamine and gave Norepinephrine infusion throughout the surgery to maintain systemic vascular resistance. The intra-operative duration was uneventful and any change in hemodynamics and oxygen saturation was maintained above 90%.

### CONCLUSION

It can be quite a challenge for an anesthesiologist to handle a patient with uncorrected TOF who underwent a cesarean section. It is important to involve a diverse team of specialists including anesthesiologist, intensivist, obstetrician, and cardiologist for core management of the situation.

**Conflict of Interest:** None.

### Authors' Contribution

Following authors have made substantial contributions to the manuscript:

PA & IA: Concept, drafting the manuscript, critical review, approval of the final version to be published

AH & MO: Study design, critical review, approval of the final version to be published

AAL & MT: Drafting the manuscript, critical review, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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