ANAESTHETIC MANAGEMENT OF A PATIENT WITH SINGLE VENTRICLE POSTED FOR LAPAROSCOPIC SURGERY

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PRESENTATION OF THE CASE

A twenty-three-year-old lady weighing 46 kgs. was admitted for laparoscopic sterilisation. She was a known case of congenital double inlet left ventricle diagnosed in infancy and no intervention had been done. She was asymptomatic and had two uneventful vaginal deliveries and was posted for laparoscopic sterilisation, 2 months after her 2nd delivery.

Her preoperative clinical examination revealed that she had a BMI of 21, Mallampati class II and clubbing of fingers. Cyanosis was absent and jugular venous pulse was normal. Pulse rate of 90 beats per minute regular rhythm, blood pressure of 110/66 mmHg. On cardiac examination loud S2 and systolic murmur of 5/6 present in pulmonary area.

DIFFERENTIAL DIAGNOSIS

- Single Ventricle
- Ebstein Anomaly
- Cyanotic Heart Disease

CLINICAL DIAGNOSIS

P2L2 with Single Ventricle.

PATHOLOGICAL DISCUSSION

Her ECG showed sinus rhythm and P Pulmonale. Echocardiography showed situs solitus, levocardia, single ventricle physiology, inverted ventricles, hypoplastic right ventricle, pulmonary artery from left ventricle with bulboventricular foramen stenosis, PV gradient of 57/25 mmHg and normal left ventricular function. Her blood gas analysis showed hypoxia with PaO₂ 51 mmHg.

Double inlet left ventricle (DILV) is a rare congenital heart disease which comprises 1% of all congenital heart malformations,¹ demonstrates single ventricle physiology. In this condition both the atria drain into left ventricle and both aorta and pulmonary artery also will be arising from the same, with a rudimentary right ventricle. Great arteries may be normally related, the aorta may be anterior and rightward or leftward or "inverted" in a posterior and leftward orientation.² Both the systemic and pulmonary circulations are in parallel, and thus a delicate balance exists between the two. Any alteration in one circuit leads to opposite change in blood flow in the other circulation.³ Anaesthesia for these

patients needs a thorough understanding of the physiology in order to maintain stable haemodynamics. We hereby report a case of a patient with Double inlet left ventricle posted for laparoscopic sterilisation.

ANAESTHETIC MANAGEMENT

A written informed consent was taken from patient after explaining the risks. It was decided to do the procedure under lesser increase in intrabdominal pressure with minimal sedation.

Patient was shifted to operating room with 20 G canula on left upper limb. Patient was premedicated with Inj. Midazolam 1 mg, Inj. Fentanyl 40 mcg, Inj. Ondansetron 4 mg, Inj. Dexamethasone 8 mg given intravenously. Patient was preoxygenated with 100% oxygen for 3 mins. Patient was induced with intravenous Etomidate 12 mg and maintained on 5% sevoflurane in 100% oxygen on spontaneous ventilation with mask, combined with local infiltration of Inj. Lignocaine 2% 5 cc. Intraoperatively pneumoperitoneum was created with carbon dioxide and patient was positioned in Trendelenburg position with minimal increase in intra-abdominal pressure and alteration in haemodynamics. The procedure was uneventful and post operatively patient was conscious and oriented.

Figure 1. Perioperative Monitoring of SpO₂, ECG, ETCO₂, NIBP

DISCUSSION OF ANAESTHETIC MANAGEMENT

Congenital heart defects are the most common birth defects. Survival to the adulthood has increased to 70% with the advancement in surgical and medical management.⁴ The aim of anaesthetic management in such patients is to prevent myocardial depression, to maintain adequate saturation, to prevent the occurrence of air embolism and to prevent other complications such as thrombosis, haemorrhage, infective endocarditis, and paradoxical embolism.⁵ The ventricular interdependence is lost in univentricular hearts, resulting in abnormal systolic and diastolic function of a single ventricle,

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and is more likely to fail under the stress of surgery and anaesthesia,⁶⁻⁸ for which the myocardial depressant drugs should be avoided.⁹ We used etomidate, opioids and sevoflurane, which are safe in these cardiac patients. These patients are at increased risk of desaturation due to associated pulmonary stenosis. Nitrous oxide was avoided to prevent fall in saturation.

FINAL DIAGNOSIS AND CONCLUSION

DILV is a rare congenital heart disease presenting in adults without any intervention in the childhood which will pose a real challenge to the anaesthesiologist. With detailed preoperative workups and close hemodynamic monitoring during the perioperative period, these patients can experience successful surgical outcomes. This patient with DILV was asymptomatic and well compensated and hence could be managed with minimal anaesthesia.

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