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Anaesthetic management of ASD with VSD with small right ventricle coming for non-cardiac surgery: A case report

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Abstract

Congenital birth defects are still placed first among common birth defects. Anaesthetist has to face great challenge in handling child with congenital heart disease coming for non-cardiac surgery. Here we present a case report of a 4 year old male child with large ASD with VSD with TRICUSPID ATRESIA with pulmonary stenosis with small right ventricle who developed brain abscess due to bypass of venous blood from pulmonary circulation thus preventing the phagocytosis of the infective organism by the pulmonary macrophages. Anaesthetic goals in these patients is to maintain or increase the SVR, minimize PVR and provide mild cardiac depression.

Keywords: Brain abscess, Ventricular septal defect (VSD), Atrial septal defect (ASD), Tricuspid atresia, pulmonary stenosis, small RV, anaesthetic management

Introduction

Congenital heart disease are still placed first among common birth defects, occurs approximately 1 in 125 live births ^[1]. There is great challenge for anaesthesiologist in handling patient with CHD coming for non-cardiac surgery ^[1, 2]. Factors important for anaesthetist are patients age, complexity of heart lesion, coupled with patients capacity to compensate, urgency of surgery and multiple co existing disease.

Material and Methods

A 4 year old male child presented with fever and convulsion which was examined and investigated as hydrocephalus? Brain abscess in our hospital. History was obtained from father, child was born at full term by normal delivery with birth weight of 2kgs. Child had cried after birth. During antenatal Check up USG was suggestive of? CHD, mother was followed up with iron and folic acid tablets. On birth child had CTEV and CHD which was diagnosed on examination, on 2d echo it was reported as ASD, VSD, tricuspid atresia, with pulmonary stenosis, with small right ventricle. Child had no distressing symptoms of CHD and so was not planned for surgery at birth. At age of 1 year during regular follow up for CHD and CTEV, child was diagnosed for oesophageal duplication cyst for which thoracotomy with excision of cyst was done. There was no developmental delay, he was immunised for age and was not on any medication.

At the age of 4 year child e was been planned for bilateral Glenn shunt surgery before which he developed fever with convulsions which suggested of hydrocephalus? Brain abscess for which he was brought to are hospital.

On examination the child was 4 kg. He had clubbing, peripheral cyanosis. Heart rate is 150, Respiratory Rate is 37/min, BP was 90/40 mm of hg with SPO2 of 78-80% on room air. On examination of cardio vascular system, he had a pan-systolic murmur. Respiratory and Per abdomen examination was normal. On admission GCS was E4V1M1, with deviation of angle of mouth to right side, tone and reflexes – normal, power 4/5 of the right side on investigation, Hemaoglobin was 14.8, Total leucocyte count was 28790, PT/INR 23/1.3, Na/k/CL 151/3/116, CSF –wnl, blood group-A positive. Rest all investigation were within normal limit. 2decho showed situs solitus, large CV VSD left to right shunt, large OS ASD right to left shunt. Severe infundibular and valvar PS gradient 67mmhg. Normal LV function. Tricuspid atresia, RV smallish. ABG showed ph 7.36, pco2 38, po2 57, hco3 21. A cardiologist opinion was sought and it was decided to do the surgery under high risk consent. On admission child's pt/inr was 27.1/2.31 with Na/k 129/7.6. It was corrected in picu with fresh frozen plasma at 10ml/kg over 30mins, inj Vit k5mg iv once a day, with 3% nacl

@5.5ml/hr over 24hour and with ½ dns650ml+13mlkcl+inj nahco320ml @55ml/hr. Child was electively intubated in picu on arrival in view of low gcs with ET 4.5mm. On discussion with neurosurgeon, craniotomy with abscess drainage was scheduled for emergency. The child was kept nil per oral for 6hrs duration. Infective endocarditis prophylaxis was given to the child 1hr before the procedure. Child was shifted to ot on ambu bag with iv crystalloids started at 50ml/hr. All monitors including pulseoximetry, ecg, capnogram were attached. Baseline readings were recorded. Child was premedicated with Inj midazolam 0.4mg and inj fentanyl 18mg in titrated doses. Arterial line was secured in the left dorsalispedis artery and IBP was recorded throughout the surgery. Child was induced with injetomidate 2.7mg and injatracurium 9mg. Anaesthesia was maintained with O₂+air+sevoflurane. His saturation improved and maintained to 92-94% throughout the surgery. Surgery lasted for two hours with 30-40ml of blood loss, 150ml of urine output with total input of 250ml of ringer lactate. Child was shifted to picu sedated and paralysed. Post of period was uneventful and was extubated two days later and was followed up.

Discussion

Brain abscess is defined as an intra-parenchymal collection

of pus that occurs due to direct inoculation of septic foci into the brain or by the haematogenic or contiguous spread of infection [3, 4]. Brain abscess that presents with neurological deficit and raised ICP is an emergency, management includes the treatment of the abscess followed by the source of present recurrences. Our patient presented with congenital heart disease with ASO which was from right to left shunt, VSD from left and right shunt with pulmonary stenosis, leading to venous blood to bypass the pulmonary circulation, thus preventing the phagocytosis of the infective organism by the pulmonary macrophages [3, 5]. There are prone to polycythemia that increases blood viscosity resulting in hypo perfusion of abscess in the brain and metabolic acidosis leading to seedling of the infective foci into the brain. It is a great challenge for anaesthetist as all commonly used induction agents have effect on SVR, PVR. In CHR, we need to maintain balance between SVR and PVR hence inhalational drugs dose and rate of drugs should be titrated.

Result

A 4year old child with large ASD, VSD with tricuspid atresia with pulmonary stenosis who developed brain abscess had an uneventful surgery and was successfully managed intra operatively under general anaesthesia.



Fig 1: Intraoperative vitals



Fig 2: Ventilator settings for a 4yr old child

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