

Question 1

A 3 year old full term 3.4 kg newborn is scheduled for an arterial switch operation (ASO). Shortly after birth, he demonstrated reverse differential cyanosis with a right arm arterial saturation of 40% and lower extremity saturation of 60% despite PGE 1. A bedside balloon atrial septostomy was performed with resolution of reverse differential cyanosis and improvement of arterial saturation to 75%. Prostaglandin E1 was discontinued 4 hours after septostomy.

He is extubated receiving 0.5 l/min supplemental O₂ through nasal cannula. His arterial oxygen saturation is 75%, BP 63/37 mmHg, Pulse 145 bpm, respiration 46 breaths per minute.

(A) MEDICAL DISEASE AND DIFFERENTIAL DIAGNOSIS

- (1) What is transposition of great arteries (D-TGA)?
- (2) What additional cardiac lesions are associated with D-TGA?
- (3) What is natural history of D-TGA?
- (4) What is pathophysiology of D-TGA?
- (5) What determines the oxygen saturation in D-TGA?
- (6) Why did this infant have reverse differential cyanosis?
- (7) What are the pre-op issues pertaining to the coronary arteries in D-TGA?
- (8) What are the clinical subsets of D-TGA?
- (9) What is the differential diagnosis of D-TGA and how is diagnosis made?
- (10) What pre-op interventions can help stabilize a patient with D-TGA?
- (11) What are the surgical options for repair? Why is one chosen over the others?

PRE-OP EVALUATION AND PREPARATION

- (1) What information is important to prepare for this case?
- (2) What are the anaesthetic goals before CPB?
- (3) What is the plan for glucose management in this patient?

INTRA-OPERATIVE MANAGEMENT

- (1) How would you monitor this patient?
- (2) What would be the best method for induction?
- (3) Is CPB in infants and children different from adults?
- (4) What is modified ultra filtration (MUF)?
- (5) Briefly describe the surgical techniques of Mustard Senning/ASO/Rastelli procedures?
- (6) What is hypothermia and how is it classified?
What is low CPB and what is deep hypothermic circulatory arrest? (DHCA)?
- (7) Why is hypothermia beneficial to the brain during low flow CPB and DHCA?
- (8) Explain the difference between and state any pH-stat blood gas measured?
- (9) What are the immediate post CPB issues following ASO?

POST OPERATIVE MANAGEMENT

- (1) How is myocardial ischemia addressed in ICU following ASO?
- (2) What immediate postoperative problems would be anticipated following the Rastelli procedure?
- (3) What intermediate and long term surgical problems are seen after ASO?
- (4) What are the long term outcomes after ASO?
- (5) What are the long term outcomes after Rastelli repair for D-TPA and LVOT (left ventricular outflow tract obstruction)?
- (6) What is long term neurologic outcome like after ASO?

Question 2

A 31 year old patient with Eisenmenger's syndrome requires a laparoscopic cholecystectomy for acute cholecystitis. Discuss your anaesthetic management and any specific concerns in this patient.