

Presentation Date/Time: Saturday, March 14, 2015; 4:50 – 6:00pm

PBLD Table #: 28

Title: Three month old infant with Blalock-Taussig shunt for Emergency Craniotomy

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Objectives

At the end of the discussion, participants will be able to:

1. Discuss the physiologic changes associated with a Blalock-Taussig shunt
2. Identify the key features of an appropriate induction, maintenance and emergence of a patient with a Blalock-Taussig shunt
3. Identify common problems with anesthetizing these patients for an emergency craniotomy
4. Outline a management algorithm for cardio-respiratory and neurosurgical complications that may arise during the procedure

Case

A crying 3 month old female infant is brought into the emergency room with his parents. The parents state that he slipped out of a care giver's hands and fell from down a few steps an hour ago. They also state that the infant has Tetralogy of Fallot and had a Blalock-Taussig shunt placed when she was a week old at a different facility. On initial survey retinal hemorrhages are also noted in the exam.

Upon examination, there is blood coming from her ear. It is determined that she will require an emergent craniotomy.

1. What information do you think is necessary prior to going to the OR?

Labs drawn in the emergency room are still pending. Preoperatively, a stat echo is requested and shows normal left ventricular systolic function, mildly diminished right ventricular function,

the BT shunt is patent and appears unobstructed with flow in the proximal branch pulmonary arteries, some antegrade flow visualized through the pulmonic valve.

2. *What are the physiological changes associated with a Blalock-Taussig shunt?*

Lab results return prior to the patient going to the OR. The hematocrit is 48% and the platelets are 225K/uL.

3. *Are the lab results unexpected?*

While the workup is being performed, the infant quiets down and appears to be sleepy. The surgeon wants to proceed to the operating room immediately due to rapidly worsening neurological exam.

4. *How do clinical signs correlate to degree of intra-cranial hypertension in infants?*

5. *Does the presence of a BT shunt affect hemodynamic monitoring?*

The patient is brought to the operating room and induced. Shortly after intubation, the heart rate changes from 80 to 110, oxygen saturation 85% to 95%, and blood pressure changes from 98/48 to 64/22.

6. *What are acceptable hemodynamic parameters and vital signs in a patient with a BT shunt?*

7. *What are appropriate methods and medications for induction in this patient?*

8. *What are appropriate parameters for ventilator settings, vital signs, fluid management and anesthetic technique for maintenance of anesthesia?*

9. *What parameters and monitors guide us to assess and maintain adequate cerebral perfusion pressure?*

After the appropriate changes have been made, the vital signs normalize for the infant. During the procedure the surgeon complains that the dura is taut and asks you for hyperventilation and volume restriction to decrease ICP.

10. Is hyperventilation to reduce brain volume an acceptable maneuver in this infant?

11. Is volume restriction acceptable? What methods can we use to guide our fluid management?

12. Is this patient at increased risk for poor outcomes / complications?

13. What are the common issues that may arise intra-operatively while anesthetizing these patients?

14. What are the pros and cons of extubation after surgery?

15. What parameters can we use to guide our post operative management?

16. Are there any red flags in this patient that we may need to address?

17. How do we proceed if there is post-operative cardiac de-compensation?

References

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