One Lung Ventilation in a Child with Bronchopulmonary Dysplasia and Sickle Cell Disease

Paul A. Miska, D.O., Amy Henry, M.D.

Medical College of Wisconsin
Children’s Hospital of Wisconsin, Milwaukee, WI

INTRODUCTION

- An 11 m/o born premature at 25 weeks.
- PMH: Seizure disorder, bronchopulmonary dysplasia (0.25L/min home O2), pulmonary HTN grade IV, sickle cell disease (HbSS), and G-tube dependency.
- PSN: VP shunt placement, G-tube placement
- Meds: Albuterol, beclomethasone, onfentanil, esmolol, spironolactone, vagabrine, home oxygen therapy
- Allergies: N/A

Admitted 1 week pre-operatively for increased cough, congestion.

PMH: Seizure disorder, dysplasia (0.25L/min home O2)

CASE REPORT

Preoperative Management:

- Medical management of current disease state
- Potential difficult airway given tracheal compression on imaging
- Stable intracranial bleed present
- Decision made not to transfuse blood
- Adequate consent given incarceration of mother

Intraoperative Management:

- Ventilation/oxygenation concerns with one-lung ventilation
- Surgical blood-loss monitoring
- Limit increases in PVR given degree of pulmonary HTN
- Avoid sickling (hypothermia, hypoxia, dehydration, venous stasis, acidosis)
- Hemodynamic monitoring with arterial line and NIRS
- Conversion to open procedure
- Potential blood transfusion (med/high risk procedure)

Postoperative Management:

- High potential for post-op respiratory failure
- Patient received intercostal rib blocks 4-8 in addition to nurse controlled Morphine PCA for post-op pain control
- Transported intubated to ICU
- Post-op Hgb: 11gm/dl and HCT: 32%. No transfusion necessary in immediate post-op period

DISCUSSION

Preoperative Management:

- Degree of mediastinal compression and tracheal shift with pneumatocele concerning for potential difficult airway
- 5Fr Arndt Bronchial blocker placed first followed by intubation with 4.0 cuffed ETT along side of bronchial blocker
- Right radial arterial line placed. Stopped working (kinked) during pneumatocele resection. Unable to salvage.
- Relied on NIRS both cerebral and somatic for regional oxygenation during procedure.
- Thoracoscopic approach abandoned d/t significantly elevated peak pressures in ventilated lung with pneumatocele compression. Transitioned to open thoracotomy

Intraoperative Management:

- Cerebral and Somatic NIRS were maintained within 15% of baseline values
- Oxygenation and ventilation adequacy monitored with NIRS after arterial line malfunction
- No intra-operative or post-operative transfusion was required
- Patient weaned from ventilator and transitioned eventually to original home-O2 requirement
- Patient has had multiple readmission for respiratory infections and acute chest syndrome, along with multiple transfusions for anemia.

REFERENCES