Spinal Anesthesia For Urologic Surgery In An Infant With Palliated Single Ventricle Physiology

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Introduction

We present the use of spinal anesthesia during urologic surgery in a 19-month old, 12.1 kilogram toddler with hypoplastic left heart syndrome (HLHS) who had undergone surgical palliation having completed the stage I hybrid and comprehensive stage II procedures.

This case describes the novel use of awake spinal anesthesia for urologic surgery in high-risk patients with congenital heart disease as a means to avoid airway instrumentation and the potential hemodynamic consequences of general anesthesia.

Awake Spinal Anesthesia

- Topical local anesthetic cream applied to lower back
- Pacifier dipped in 24% sucrose oral solution
- Patient placed in the sitting position
- 1.5”, 22-gauge spinal needle with a stylet
- Bupivacaine 0.5% in a dose of 0.5 mg/kg
- Epinephrine or clonidine may be used to prolong duration
- Provides approximately 90 minutes of surgical anesthesia
- IV placed in the foot after placement of spinal anesthesia

Discussion

Infants with HLHS frequently have associated conditions requiring non-cardiac surgical procedures. Given the associated co-morbid CHD, there is an increased risk of perioperative morbidity and mortality in this patient population.

Following the comprehensive stage II procedure on the hybrid pathway for patients with HLHS, the peroperative concerns include maintaining adequate pulmonary blood flow through the Glenn anastomosis. Avoidance of prolonged NPO times, intravenous hydration while NPO, and fluid loading prior to anesthetic induction may be helpful in avoiding intravascular volume depletion.

Endotracheal intubation, positive pressure ventilation, and the use of positive end expiratory pressure may all decrease pulmonary blood flow and cardiac output in this setting.

In an effort to avoid the potential deleterious effects of general anesthesia, airway instrumentation, and the potential need for positive pressure ventilation, spinal anesthesia can be a viable option.

References

11. Images adapted from <http://www.nationwidechildrens.org/hypoplastic-left-heart-syndrome>