Caudal Anesthesia and Dexmedetomidine Sedation for Ventral Hernia Repair

Natalie Barnett MD, Yiyi Liu MD
Department of Anesthesiology, Cohen Children’s Medical Center, New Hyde Park, NY

Introduction

The avoidance of general anesthesia with endotracheal tube placement has its advantages in surgery involving ex-premature infants with a tenuous respiratory status. Also of concern are the potential long term, neurobehavioral consequences to exposure to inhalational anesthesia in infancy. A procedure including bilateral inguinal and unilateral ventral hernias is typically performed under general anesthetic, as caudal anesthesia may not provide adequate level of anesthetic. We present here effective caudal anesthetic for the above procedure when supplemented with dexmedetomidine.

Case Presentation

- 3 month old female ex-24 weeker, with past medical history of patent ductus arteriosus status post ligation, necrotizing enterocolitis with bowel perforation complicated by dehiscence, anemia of prematurity, and Grade II intraventricular hemorrhage.
- Weight and length of 3.124 kg and 43 cm.
- Presented for repair of bilateral inguinal and unilateral ventral hernias.
- Prior anesthetic course was complicated by prolonged intubation and extreme parental anxiety surrounding intubation.
- After extensive discussion with the family and surgical team, an anesthetic strategy of caudal anesthesia dexmedetomidine infusion for sedation was chosen.

Management

Surgical course:
- Standard ASA monitors were attached.
- Nasal cannula oxygen was delivered at a rate of 2L/min.
- Dexmedetomidine infusion was started at a rate 0.7 mcg/kg/hr.
- Caudal anesthesia was easily achieved with 3 mL bupivicaine 0.25% + epinephrine 5 mcg/mL.
- Supplemental boluses of 1.2 mcg dexmedetomidine and boluses of 2.5 mg of propofol were given intermittently as needed.
- Duration of the surgery was 62 minutes.
- Procedure was tolerated with adequate analgesia and sedation.
- She maintained her airway for the length of surgery.

Post-operative course: The patient was transferred to the neonatal ICU where her postoperative course was uncomplicated and she was discharged after an appropriate period of monitoring.

Discussion

- No studies unequivocally demonstrate permanent, deleterious effects on behavior and cognition from brief exposures to general anesthesia.
- In vitro studies have shown neurotoxicity from inhalational agents.
- Regional anesthesia techniques with intravenous sedation would avoid these exposures.

Potential problems with this technique include:
- Prolonged surgery outlasting the block or total caudal block failure and conversion to a general anesthetic with an endotracheal tube.
- Respiratory irregularities from the dexmedetomidine infusion, including respiratory irregularities which mimic hiccoughs, apnea after boluses, bradycardia and hemodynamic changes.

This patient tolerated the procedure well without necessitating conversion to a general anesthetic. Given the success of this anesthetic strategy, we plan to continue to attempt this technique for appropriate procedures below the umbilicus in patients without contraindications to caudal anesthesia.

References