

Quadratus Lumborum and Rectus Sheath Blocks in an Infant with Severe pulmonary Hypertension Undergoing Laparoscopic Cholecystectomy; A Case Report.

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Introduction

Perioperative pain management and blunting of stress responses is challenging in infants with severe pulmonary hypertension (PH) especially those with pre-existing opiate tolerance. Unmanaged painful stimuli can precipitate pulmonary hypertensive crisis with severe hemodynamic consequences. Regional anesthesia, as part of multimodal analgesia, may be uniquely advantageous in managing acute pain in this population. While neuraxial approaches are excellent at blocking the stress response during abdominal surgery and are commonly used in small infants, absolute and relative contraindications may preclude their use. We present the case report of an infant with severe PH presenting for laparoscopic surgery for which bilateral rectus sheath (RS) and quadratus lumborum (QL) blocks were placed for perioperative blunting of stress responses to surgical stimuli.

References:

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Case/Method

A 5-mo 5.3-kg male with severe PH due congenital diaphragmatic hernia presented for laparoscopic cholecystectomy. He had acute cholecystitis with ongoing bacteremia. He was mechanically ventilated with frequent breakthrough agitation and hemodynamic deterioration characteristic of pulmonary hypertensive crisis, requiring escalation of sedation. Baseline sedation was robust, consisting of continuous infusions of morphine, midazolam, dexmedetomidine, scheduled methadone and as needed boluses of ketamine, midazolam and morphine. Baseline infusions were continued in the operating room. Prior to incision, the abdominal wall was imaged with ultrasound using a 3.5cm linear transducer oscillating at 18MHz. The rectus abdominis muscles were located and 0.75ml/side of ropivacaine 0.2% was administered into the lateral edges just superficial to the transversalis fascia with a 22G 5cm needle. The QL blocks were performed by injecting 2.0ml/side of ropivacaine 0.2% into the thoracolumbar fascia at the posterolateral edge of the QL muscles.

Over the course of the surgery and the following day in ICU, the infant remained hemodynamically stable with no oxygen desaturations and no changes to baseline sedation.

Discussion

This infant typifies many of the issues in opiate tolerant patients with PH. Intraoperative painful stimuli can precipitate pulmonary hypertensive crisis. Epidurals are considered the gold standard for analgesia following abdominal surgery in small infants but the ongoing bacteremia in this infant was considered a relative contraindication to neuraxial techniques. The opioid sparing effects of paravertebral nerve blocks in mechanically ventilated infants has been described but these blocks were also contraindicated due to the risk of pneumothorax. Single injection QL plus RS block were chosen for their long duration and low risk profile. Special attention was paid to the volume of Ropivacaine administered, in order to stay under the toxic doses (3mg/kg).

While the exact role the RS and QL blocks played in this patient is unclear, the lack of hemodynamic reactivity and consistent arterial oxygenation and lack of need for escalating sedation is encouraging. In this population of patients, all potential means to prevent hypertensive crisis including abdominal wall blocks should be considered.