

Perioperative Anesthetic Management of Delayed or Repeat Bladder Exstrophy Repair

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Introduction: Pediatric bladder exstrophy patients with failure of previous bladder closures or with congenital small bladder templates are at high risk of urinary incontinence.(1) Surgical reconstruction in the toddler involves closure of the bladder, posterior urethra, and abdominal wall with pelvic osteotomies. Appropriate patient and pelvic immobilization, sedation, and pain management are essential to prevent distracting forces from separating the repair and to provide the child with the best chance for urinary continence. We present a review of our experience.

METHODS: After obtaining IRB and HIPAA approval we reviewed the perioperative management of 11 consecutive children undergoing delayed or repeat surgical repair of bladder exstrophy at the Johns Hopkins Hospital. Data are presented as average SD.

RESULTS: RESULTS: 11 children (8 males), averaging 13.1 ± 6.3 (range 7-28) months of age, weighing 12.7 ± 1.7 (range 8-12.7) kg underwent delayed or repeat surgical repair of bladder exstrophy with osteotomies. Five patients had a history of failed closures without osteotomies. One patient had two failed closures, the first without and the second with osteotomies. Intraoperatively, all patients were paralyzed with muscle relaxants, intubated, and ventilated with oxygen, air, and sevoflurane or isoflurane. Invasive monitoring included placement of internal jugular central venous catheters (n=7) or peripherally inserted central catheters (n=3). Tunneled caudal (N=10) or lumbar (N=1) epidural catheters were placed in all patients. Both the insertion site and tunneled emergence site were secured with occlusive dressing. Anesthesia preparation and operating time averaged 1.5 ± 0.4 and 10.8 ± 1.9 hours respectively. Intraoperative epidural anesthesia was initiated with injections of 0.25% bupivacaine with epinephrine and maintained by intermittent boluses (N=9) or a continuous infusion (N=2). Bupivacaine dosing averaged 1.11 ± 0.49 mg/kg/H. At the completion of surgery, all children were placed in traction which remained in place for 6 weeks. They initially recovered in the PICU for 1.4 ± 0.5 days, except for one patient who remained for 19 days. Another patient returned to the PICU for 2 days for pain/agitation. Postoperatively, all patients had epidural infusions of either lidocaine 1.5 mg/kg/H with fentanyl 0.5 mcg/kg/H (n=3) or bupivacaine 0.3 mg/kg/H with dilaudid 3 mcg/kg/H and clonidine 0.3mcg/kg/H (n=8). Infusions were maintained for 19.8 ± 4.4 (range 13-24) days. Patients needed at least one change in the infusion level with 6 increasing their dose. Only one patient had the infusion held to minimize risk of lidocaine toxicity. Multimodal analgesic therapy included acetaminophen, NSAIDS, and occasional opioid rescue doses. Sedation was maintained with diazepam (max 0.2 ± 0.1 mg/kg) for 41.3 ± 6.7 (range 25-48) days and butorphanol for 30 ± 11.3 (range 15-45) days. After removal of the epidural catheter children received oxycodone (N=4) or methadone (N=6) for analgesia. Opioids and sedatives were weaned gradually before and after discharge. No child developed bladder prolapse or wound dehiscence.

DISCUSSION: The use of tunneled epidural and central venous catheters has dramatically changed the perioperative analgesic and sedation management of children with delayed or repeat bladder exstrophy. The prolonged analgesia and sedation needs of these toddlers require close cooperation between pediatric genitourinary surgeons, anesthesiologists, perioperative nurses, and the pain team. Immobility, analgesia, and sedation resulted in an excellent cosmetic repair with no case of bladder prolapse or wound dehiscence providing these children with their best chance for eventual urinary continence.

Refs:

1. Gearhart JP et al. Urology 1996