Intraoperative Management

Circulating Nurse
- Put in line to use 8.5° scope and calibrate for 0° and 30° down with 0° scope to enter first
- Set insufflation pressures
  - < 12 years: 10 mmHg
  - ≥ 12 years: 12 mmHg
- Set cautery
  - Cut on “1”
  - Coag on “Blend 15”
  - Bipolar on “25”
- SCD or TED stockings for thrombosis prevention if over age 12 (OR Protocol)
- Sonosite Ultrasound (big probe) to confirm stent position
- Age-appropriate active warming

Anesthesia/Pain
- **IV Fluids**: After IV placement give NPO deficit plus 1.5 x maintenance over 1 hour, then 1 x maintenance, unless contraindications to extra fluids
- Patient to be paralyzed to ease insufflation
- Place oral/gastric tube to be removed at end of case
- Local anesthetic
  - Bupivacaine 0.25% 0.5 ml/kg
  - Incisional subcutaneous 2-5ml
- **Aerosolized intraabdominal**, remaining volume
- Repeat at end of case
- Age ≥ 3 years: Dexamethasone 0.15 mg/kg max 8mg and ondansetron 0.15 mg/kg max 4mg to prevent nausea and vomiting

Infection Prevention
- First-line: cefazolin 30 mg/kg IV q 3 h max 2,000 mg/dose
- If history of resistant infection: ceftriaxone 75 mg/kg IV max 2,000 mg/dose
- If allergic to penicillin or history of MRSA with known sensitivity: clindamycin 10 mg/kg IV q 3 h max 900mg/dose
- If history of MRSA resistant to clindamycin: vancomycin 15 mg/kg IV max 1,000 mg/dose over 60 minutes

Safety Alerts
- Deviation from protocol expected (fluids, ketorolac, morphine)
  - Renal insufficiency, for example
    - Low GFR (< 90 mL/min/1.73m²)
  - Solitary kidney
  - Nephrostomy tube in place
  - Heart disease
- **Dexamethasone**
  - Contraindicated if malignancy

Patient fit for transport to PACU, then acute care unit

Phase Change
Pyeloplasty v3.1

Safety Alerts
Deviation from protocol expected (fluids, ketorolac, morphine)
- Renal insufficiency, for example
  - Low GFR (< 90 mL/min/1.73m²)
- Solitary kidney
- Nephrostomy tube in place
- Heart disease

Inclusion Criteria
- Age 4 months – 21 years requiring robotic pyeloplasty

Exclusion Criteria
- Age <4 months
- Open surgery
- Redo pyeloplasty

Postoperative Management

Vital signs
- Standard vital signs per acute care guidelines
- Strict I/O

Activity
- Out of bed ad lib
- May bathe

Nursing
- Follow Ureteropelvic Junction Guidelines of Care (for SCH only)
- Foley catheter to gravity drainage
- Continue thrombosis prevention, if indicated
- Encourage ambulation

Diet
- Regular

IV Fluids
- D5½NS 1 x maintenance IV plus PO (no potassium)

Medications
- Acetaminophen PO/PR q 4h
- When urine output >1 ml/kg/hr, ketorolac IV q 6 h x 72 h; hold for urine output <1 mg/kg/hr
- Ondansetron q 6h prn nausea
- Diphenhydramine q 6h prn itching
- Morphine IV q 2h and oxycodeone PO q 4h prn breakthrough pain
- Polyethylene glycol (Miralax)
- If pills tolerated, docusate
- Oxybutynin TID as needed for bladder spasms
- Home meds

Discharge Criteria
- Temperature <38°C
- Ambulating
- Tolerating oral intake and oral pain medicine
- Family comfort with post-operative management plan established
- Voiding spontaneously

Discharge Instructions
- No restrictions
- Return for JJ stent removal 2-6 weeks postop
- Postop constipation

For questions concerning this pathway, contact: Pyeloplasty@seattlechildrens.org
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Last Updated: June 2017
Valid Until: June 2018
IV Fluids: After IV placement give NPO deficit plus 1.5 x maintenance over 1 hour, then 1 x maintenance, unless contraindications to extra fluids

- Rationale is to replace deficit from NPO, and hyperhydrate to counteract the oliguria that occurs with laparoscopic procedures. This also facilitates sooner administration of NSAIDs for pain management.

Evidence [Expert opinion]
Aerosolized Intraabdominal Bupivacaine

- Local anesthetic
  - Bupivacaine 0.25% 0.5 ml/kg
  - Incisional subcutaneous 2-5ml
  - Aerosolized intraabdominal, remaining volume
  - Repeat at end of case

- Recommendation

  Aerosolized intraabdominal bupivacaine used intraoperatively has been associated with a reduction in postoperative shoulder pain (24% saline vs 5% bupivacaine, \( p=0.014 \)). [1] (Freilich 2008, Lorenzo 2012)
We used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial, or observational studies. The rating is then adjusted in the following manner:

Quality ratings are *downgraded* if studies:
- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings can be *upgraded* if it is felt that:
- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

**Quality of Evidence:**
- ⭐⭐⭐⭐ High quality
- ⭐⭐⭐ Moderate quality
- ⭐⭐⭐ Low quality
- ⭐⭐⭐⭐ Very low quality

Expert Opinion (E)

Summary of Version Changes

- **Version 1.0 (6/26/2013)**: Go live
- **Version 2.0 (7/9/2014)**: Updated maintenance fluids rate in OR care
- **Version 3.0 (3/3/2016)**: Removed tamsulosin from medications
- **Version 3.1 (6/19/2017)**: Updated cefazolin to new standard from 20mg/kg to 30mg/kg
Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children’s Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.
Literature Search

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian. Searches were performed on September 20th & 21st, 2012 in the following databases: on the Ovid platform – Medline (1946 to date), Cochrane Database of Systematic Reviews (2005 – June 2011); elsewhere – Embase, National Guideline Clearinghouse, Clinical Evidence, and TRIP. Retrieval was limited to literature from 1992-forward. There were no age restrictions included. Results were limited to English language. As per the owners request, the search was focused broadly on pyeloplasty. In Medline, appropriate Medical Subject Headings (MeSH) were used, along with text words, and the search strategy was adapted for other databases using their controlled vocabularies, where available, along with text words. Owner assisted with identifying appropriate MeSH. Only synthesized, high levels of evidence were included. Scout Search publication limits of consensus development, guidelines, meta-analyses, and practice guidelines were used. Additional MeSH publication headings of critical pathways, clinical protocols, guidelines as topic, and practice guidelines as topic were also included. Systematic reviews as a title word rounded out the publications search.

Jamie Graham
January 22, 2013

Identification

- 114 records identified through database searching
- 3 additional records identified through other sources

Screening

- 115 records after duplicates removed

Eligibility

- 115 records screened
- 62 records excluded
- 53 full-text articles assessed for eligibility
- 42 full-text articles excluded, 32 did not answer clinical question, 10 did not meet quality threshold

Included

- 11 studies included in pathway

Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535


Nebulization of Bupivicaine Intra-Abdominally Reduces Post-Operative Shoulder Pain and Opioid Use In Children Undergoing Robotic-Assisted Urologic Surgery AAP Section on Urology; 2012; ; 2012.


Approved by the CSW Pyeloplasty for July 9, 2014

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Retrieval Website: http://www.seattlechildrens.org/pdf/pyeloplasty-pathway.pdf

Please cite as: