Gastroschisis Clinical Guideline

Inclusion Criteria: All infants born with gastroschisis

Prenatal Recommendations

Antepartum Care:

- Ultrasound suspicious for gastroschisis: refer to Maternal-Fetal Medicine (MFM) for detailed ultrasound exam.
- Referral for Genetics consultation.
- Referral to Pediatric Surgery.
- Ongoing fetal surveillance to include ultrasound approximately every 2 weeks to evaluate fetal status, bowel thickening, dilatation, fluid, and growth.
- Initiation of antepartum fetal monitoring with twice weekly Nonstress Test (NST)/weekly, Amniotic Fluid Index (AFI) at 33-34 weeks or sooner if other co-morbidities (e.g., Intrauterine Growth Restriction (IUGR) are noted.
- Multidisciplinary care meeting to involve Obstetrics, MFM, Neonatology, Genetics and Pediatric Surgery.

Delivery:

- Recommended delivery at a medical center with a Level IV NICU.
- Routine preterm delivery (less than 37 weeks) or induction is not recommended.
- Vaginal delivery is recommended.
  - Cesarean section only for obstetrical indications.

Delivery Room

Pre-briefing:

- Team huddle to discuss plan of care and clearly define team member roles.
- Advanced preparation of supplies including equipment for intubation, 8 and 10 French (Fr) Salem Sump (SS), sterile bowel bag, and warm normal saline.

Delivery/Resuscitation:

- **Routine intubation is not recommended.** Establish safe airway. CPAP acceptable if there is effective gastric decompression to prevent aspiration of gastric contents. Monitor leads can be placed on patient's upper chest and arms.
- Assess temperature; risk of hypothermia related to surface area of exposed bowel.
- Placement of 8 Fr (preterm and/or < 2500 grams) and 10 Fr (term) SS orogastric or nasogastric tube to low intermittent suction (LIS) (40-60 mmHg).
- Care of the exposed bowel:
  - Assess color (perfusion), shape (kinks), and size (dilatation) of bowel.
    - Utilize sterile gloves when manipulating bowel.
    - Position patient and bowel on right side to prevent vascular compromise.
  - Prepare bowel bag with approximately 30 mL of warm sterile normal saline to moisten the inside of the bag.
  - Put baby from the nipple line down into the bag. Do not cut holes in the bag. Do not use saline soaked gauze.
- **Long umbilical cord (10 cm) requested**

Transport Team:

- Position patient and bowel on right side and utilize bowel bag or saran wrap (if bowel bag not available) to wrap bowel and secure to patient (see Figure 1). **Do not use saline soaked gauze.**

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Upon NICU Arrival

Equipment:

- For patients undergoing suture-less closure at bedside (at discretion of surgeon), bedside RN to gather required supplies. Checklist with required supplies available in surgical corner across from Room 467.
- For patients undergoing bedside silo placement use old-style warmer – silo will be suspended from it during reduction – see below under "Guidelines for Surgeon."

Respiratory:

- Establish a safe airway but **routine intubation is not recommended.** May use HFNC or CPAP but ensure good bowel decompression with SS.

IV Fluids and Access:

- Establish IV access and PICC placement upon arrival. Avoid umbilical lines. Upper extremity IV access is preferable due to placement of bowel bag.
- Initiate D10W at 80-100 mL/kg/day due to increased insensible losses from exposed bowel:
  - NS boluses as needed for treatment of metabolic acidosis and to compensate for increased insensible losses.
- Evaluate glucose: Perform dextrose stick. IUGR patients are at risk for hypoglycemia.

Antibiotics:

- Draw blood culture on admission and start ampicillin and gentamicin for minimum 48 hours rule out. Additional antibiotic duration per the discretion of the team pending clinical course.

Gastrointestinal:

- NPO and MOPs (Milk oropharyngeal) until hemodynamically stable.
- Continue SS to LIS:
  - Consider replacement of high-volume SS output (>15 mL/kg/shift) with ½ NS (replace 1 mL/mL output over 4 hrs).
- Keep umbilical cord moist with Vaseline gauze.

Guidelines for Surgeon:

- Primary closure or routine silo placement are acceptable at CHOC Children's.
- Operative and bedside closure are acceptable.
- Silo-assisted immediate closure and suture-less closure are acceptable.
- Routine intubation and paralysis are not recommended for silo placement and reduction.

Silo Placement at bedside (see Figure 2):

- Placement by surgeon.
- Medications: Morphine or fentanyl PRN for pain.
- After silo is placed, wrap bottom of silo with Kerlix gauze to absorb fluid losses. Saturated silo dressings should be weighed and documented as outpatient to accurately account for fluid losses.
- Secure silo to overhead warmer with trach string ties to keep silo contents completely perpendicular to infant abdomen. Use minimal tension in securement. Warmer bed should be in flat position.
- Antibiotics not necessary in the absence of culture positive sepsis or clinical instability or for silo presence.
- Assessment post-silo placement:
  - Respiratory status, pulses, perfusion of extremities and bowel.
- Daily silo reduction by surgeon at bedside:
  - Supplies: Sucrose, umbilical tape, pain medication, if necessary
  - Assess color (perfusion), size (dilatation) of bowel after reduction; obtain daily photos.
- Daily silo dressing changes by Surgical NNP utilizing xeroform gauze and gauze kling wrap:
  - If saturated dressing may be changed by bedside nurse prn.
- Recommend closure within 3 days, if feasible, when using a silo.

Suture-less Closure at bedside:

- Performed by surgeon at bedside.
- Neonatologist to provide conscious sedation.
- Endotracheal intubation not recommended for suture-less bedside closure.

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Post-operative Interventions

Gastric Decompression:

- SS to LIS (40-60 mmHg):
  - SS/ostomy output >10-15 mL/kg/shift, consider ½ NS replacement IVF (replace 1 mL/mL output over 4 hrs)
  - SS to gravity → consider when gastric output < 20-30 mL/kg/d and non-bilious/clearing
  - SS removal → consider with tolerance (no emesis) of SS to gravity

Fluids and Nutrition:

- NPO, MOPs and TPN/SMOF lipid® for full nutritive support.
- Risk of compartment syndrome: abdominal hypertension causes decreased blood flow to the kidneys and results in oliguria, decreased cardiac venous return and possibly intestinal ischemia:
  - Monitor urine output, capillary refill in distal extremities, pulses, and abdominal distention.

Antibiotics:

- Antibiotics to begin post-operatively if need initiated prior to operative intervention. Recommend discontinuation of antibiotic therapy 24 hrs after abdominal closure in the absence of culture-positive sepsis or clinical instability.

Pain management per Surgical Pain Guideline #2

Closure Site Dressing:

- First dressing change to be performed by surgeon or NNP.
- Use of wound vac to aid closure healing per surgeon.

Postoperative Complications:

- Risk of short bowel syndrome (SBS) and/or intestinal failure (IF) if large segment of intestine is resected and/or there is significant intestinal dysmotility related to gastroschisis.
- At risk for dysmotility, electrolyte abnormalities, bacterial overgrowth, and growth failure.
- At risk for intestinal failure associated liver disease (IFALD) and central line-associated blood infection.

Postoperative Feeding:

- Surgical team clearance and return of bowel function (stool/ostomy output and tolerance of SS removal).
- Use human milk (maternal/parent's or pasteurized donor), PO vs gavage per CGA/respiratory status:
  - Surgical Feeding Guideline 1: Consider for preterm infants (< $34^{0/7}$ weeks GA and/or < 2 kg) or infants with significant dysmotility or bowel resection.
  - Surgical Feeding Guideline 2: Consider for infants > $34^{6/7}$ weeks GA and uncomplicated postoperative course.
  - Infants with SBS/IF: Refer to Neonatal Short Bowel Syndrome and Intestinal Failure Care Guideline.

Discharge Planning

- Pediatric Surgery follow up 2-3 weeks after discharge.
- Pediatrician 1-3 days after discharge.
- Refer to GI and Bridge at clinical team's discretion.
- Arrange follow-up with subspecialities consulted while inpatient as indicated.

Figure 1

Figure 2

Gastroschisis Clinical Guideline
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