

Gastroschisis / Omphalocele

Anesthetic Pearls:

Gastroschisis

- Evisceration of abdominal contents through abdominal wall just lateral to umbilicus (right side)
- No peritoneal sac (contents exposed to amniotic fluid resulting in chemical peritonitis and thick/edematous membrane)
- Non-rotation of the gut (liver almost never eviscerated)
- Intestinal atresia (10-15%)
- Intrauterine bowel perforation (5-6%)
- Infrequent associated anomalies (rare chromosomal syndromes)
- Incidence 1:20,000 (equal sex distribution)
- 40% premature or small for gestational age

Omphalocele

- Covered defect (amniotic sac) of umbilical ring into which abdominal contents herniate (outer layer amnion and inner layer peritoneum); umbilical cord inserts into sac
- Epigastric location causes more chest / heart abnormalities; hypogastric location involves more genitourinary / neural abnormalities; liver involved in sac (35%)
- 1:5,000 (males > females)
- Related anomalies (50%): prematurity and chromosomal abnormalities (Trisomies 13 / 18 / 21, Pentalogy of Cantrell, Beckwith-Wiedemann Syndrome)
- 10% sac ruptures (exposure to amniotic fluid)

Peri-Operative Concerns

1. Prematurity
2. Infection
3. Fluid status - abnormal losses (evaporative, 3rd space) - isotonic
4. Temperature instability (age, heat loss, resuscitative efforts)
5. Condition of abdominal contents (intestinal atresia, perforations, blood supply, effects of peritonitis)
6. Other congenital abnormalities:
 - Intracardiac defects / shunts
 - Pulmonary – may with large defects may have pulmonary hypoplasia
 - Urinary – may have congenital defects (omphalocele) or compromise secondary to fluid status

- Metabolic – neonatal (immature) liver function, also hypoglycemia with Beckwith-Wiedemann Syndrome
- Neuro – concurrent meningoceles (omphalocele)

Intra-Operative Concerns

1. Oral-gastric decompression
2. Good vascular access with ongoing fluid resuscitation (isotonic crystalloids / colloids; glucose for metabolic needs)
3. A-line (monitor cardiac / metabolic / respiratory status in large defects)
4. Temperature (monitor and prevent heat loss)
5. Urine output
6. Airway – endotracheal intubation (adynamic ileus so avoid distention of stomach with mask / bag; awake vs. RSI with cricoid pressure)
7. Pulse oximeter (pre-ductal [brain oxygenation] and post-ductal / lower extremity [peripheral perfusion])

Anesthesia

- A. Inhalation agents +/- narcotics
- B. Muscle relaxants – maximal relaxation except for minor defects (most repair techniques require post-op mechanical ventilation)

Surgery

1. Single stage repair if defect small versus multistage (silastic silo) reduction and subsequent closure abdominal wall
2. All surgical options are associated with increased intra-abdominal pressure (if > 20 mmHg and CVP changes by > 4, then consider silo and staged reduction / closure otherwise can get decreased cardiac index and renal / hepatic / gut ischemia)
3. Pulmonary compromise if abdominal pressure too high

Post-Operative Management

- A. Increased fluids still necessary
- B. Mechanical ventilation and weaning
- C. Sedation / pain relief
- D. Nutrition – TPN (adynamic ileus may persist several days / weeks post-op)
- E. Infection control