GASTROCHISIS & ANESTHESIA

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1. Review the embryology and pathogenesis of the gastrointestinal tract.

2. Review the physiology and pharmacology of the gastrointestinal tract.

3. Review the preoperative evaluation and preparation of gastroschisis repair.

4. Review the anesthetic management for gastroschisis repair.

5. Review the postoperative care of gastroschisis repair.

6. Review the ventilator care for gastroschisis repair.
- **Standard III**
  - Formulate a patient-specific plan for anesthesia care
GASTROSCCHISIS

Definition, epidemiology, incidence, functions of the gastrointestinal tract & pathophysiology
GASTROSCHISIS

- Rare birth defect of the abdominal wall.
  - Often to the right of the umbilical cord.

- Occurs when normal sequence of the intestinal tract is interrupted.
  - Ophalomesenteric artery is occluded.
Epidemiology

- Idiopathic
- Maternal components
  - Young
  - Maternal exposure
    - Environment toxins
    - Drug use
    - Smoking
INCIDENCE

- Occurs in 1:15,000 births
  - usually not associated with other congenital anomalies

- About 1,871 babies are born each year in the United States with gastroschisis
FUNCTIONS OF THE GASTROINTESTINAL TRACT

- Functions are:
  - To ingest
  - To digest
  - To absorb
  - To excrete

- Process begins in the first 8 weeks of life.
Gastrointestinal tract develops between 4-16 weeks gestation

- Foregut
  - Upper GI tract

- Midgut
  - Duodenum
  - Transverse colon

- Hindgut
  - Transverse colon
  - Descending colon
  - Sigmoid colon
  - Rectum
  - Anal sphincter
What to expect and goals of care
WHAT TO EXPECT

- Surgical emergency
  - Exposed bowel
    - Potentially other organs depending on severity
  - Fluid resuscitation
    - 20mL/kg isotonic fluid boluses
  - Hypothermia
    - Plastic bag or warm saline soaked gauze
  - Infection prevention
    - Give antibiotics
GOALS OF CARE

- Prevent hypothermia and hypovolemia
- Gastric decompression
- Maintain perfusion to viscera
- Infection prevention
Primary Closure vs Secondary Closure
PRIMAR Y CLOS UR E

- All contents are returned into the abdominal cavity post delivery
  - Fascia and skin are closed.
  - Complications
    - Increased intra-abdominal pressure
SECONDARY CLOSURE

- Staged repair
  - Viscera is placed in an extra abdominal silo
    - Must be a 90 degree angle
  - Used in infants with large defects
  - Reduction technique
Anesthesia Management: Monitoring, Induction, Maintenance, Emergence, Complications
MONITORING

• Apply monitors
  • SPO2
  • 3 Lead EKG
  • Blood Pressure cuff
  • Temperature probe
  • Ventilation
  • Fluid balance

• Arterial line

• Urinary catheter
INDUCTION

- Ensure adequate IV site
- Administer Atropine
  - To prevent vagal response
- Pre-oxygenate
- Propofol and a muscle relaxant for rapid sequence intubation
- Pain control from the beginning
Avoid high FiO2
  - Use an air and oxygen mixture and keep the oxygen saturation between 95-100%.

No caudal, use fentanyl and low dose sevoflurane.

Be sure to take note of initial PIP prior to abdominal closure.

Maintain NMB for abdominal closure.
EMERGENCE

- Upon closure be sure to look at the patient
- Remain intubated post-op
- Transport to the NICU
COMPLICATIONS

- Hypothermia
- Hypovolemia
- Respiratory insufficiency/Hypoventilation
- Atelectasis
- Volume overload/Pulmonary edema
- Abdominal compartments syndrome
Anesthesia for neonates who have abdominal wall malformations can be challenging to those who administer anesthesia. It is important that comprehensive anesthesia management begins with understanding the disease and evaluating the patient.
LET’S REVIEW
WHAT IS THE INCIDENCE OF GASTROCHISIS IN NEONATES?

A. 1:150,000 births
B. 1:15,000 births
C. 1:10,000 births
D. 1:50,000 births
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AT WHAT WEEK GESTATION DOES THE GASTROSchisis DEFECT OCCUR?

A. 4 weeks gestation
B. 8 weeks gestation
C. 10 weeks gestation
D. 12 weeks gestation
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D. 12 weeks gestation
WHAT ARE THE EFFECTS OF ABDOMINAL CLOSURE FOR GASTROCHISIS?
(SELECT ALL THAT APPLY)

A. Increased intra-abdominal pressure
B. Increased ventilator reserve
C. Decreased organ perfusion
D. Decreased ventilator reserve
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B. Increased ventilator reserve
C. Decreased organ perfusion
D. Decreased ventilation
WHEN MONITORING THE $\text{SPO}_2$ DURING SURGERY, WHERE IS THE BEST PLACE FOR THE PROBE?

A. Right hand
B. Left hand
C. Forehead
D. Either foot
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A. Right hand
B. Left hand
C. Forehead
D. Either foot
WHAT IS THE MOST IMPORTANT VITAL SIGN TO MONITOR IN BABIES?

A. Heart Rate

B. Respiratory Rate

C. Blood Pressure

D. Temperature
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