

# American Pediatric Surgical Association

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## Standardized Toolbox of Education for Pediatric Surgery

### Duodenal Atresia

APSA Education Committee  
2019-2020



**APSA**  
American Pediatric  
Surgical Association  
*Saving Lifetimes™*

# Duodenal Atresia

- **Janice A. Taylor, MD**
  - **University of Florida, Gainesville**
- **Edited by:**
  - Grace Mak, MD (The University of Chicago Comer Children's Hospital)
  - Steven L. Lee, MD, MBA (UCLA Mattel Children's Hospital)



# History

- **30-week female born with pre-natal testing concerning for Trisomy 21 and coarctation of the aorta.**
- **Patient had large volume, yellowish emesis about 3 hours into her NICU admission.**



# History Discussion Slide

- **What other points of the history do you want to know?**
  - **Maternal hx:** Gestational diabetes? History of narcotic use? Previous children with congenital anomalies?
  - **Medical hx:** Other pre-natal concerns with this fetus (fetal ultrasound findings, cardiac anomalies, genetics, amniotic studies)? Previous pregnancies with congenital anomalies?
  - **Birth hx:** Meconium staining at delivery? Passage of meconium yet? Confirm color of emesis since birth.
  - **Family hx:** Congenital anomalies?



# Differential Diagnosis

- **Intestinal atresia/web/stenosis**
- **Pre-duodenal portal vein**
- **Malrotation**
- **Annular pancreas**
- **Poor motility related to prematurity or maternal factors (consider the history)**



# Physical Exam

- **What specifically would you look for?**
  - **Vital signs:** typically normal
  - **Appearance:** vigorous and pink (unless significant cardiac defect present)
  - **Relevant exam findings:** fullness of upper abdomen on palpation
    - Consistent with dilated stomach and duodenum, distal bowel collapse



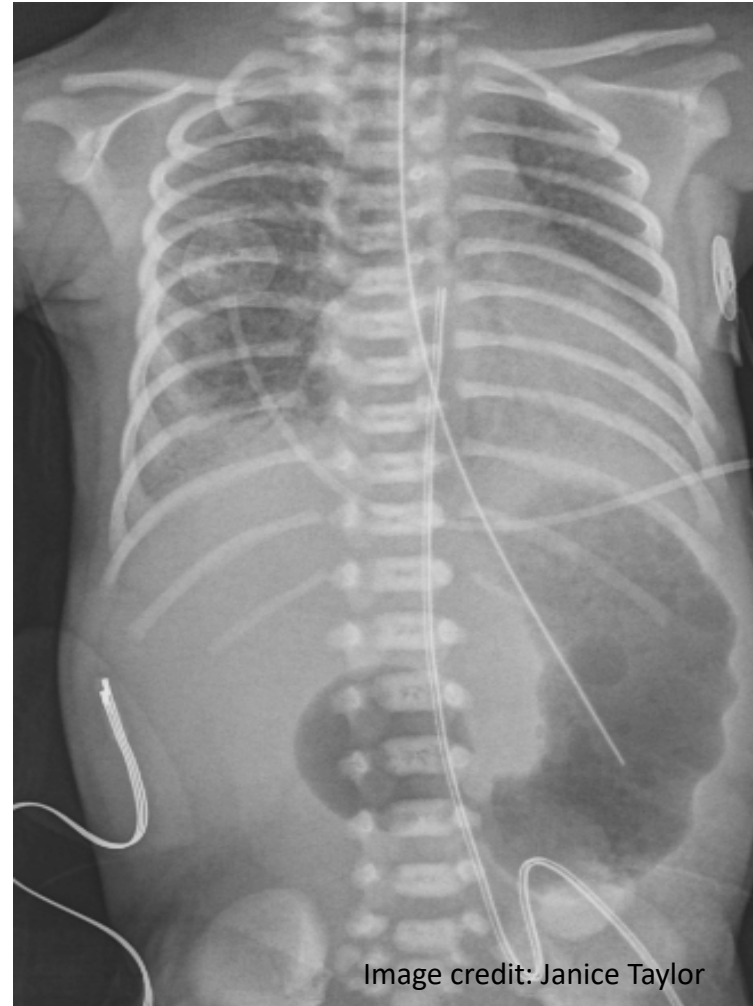
# Studies (Labs, Imaging)

- **What labs are needed?**
  - No specific labs for duodenal atresia
  - When planning for surgery, obtain CBC, complete metabolic panel, coagulation studies
- **What imaging is needed?**
  - Babygram
  - Possibly Upper GI



# Study Results

- **Lab work:**
  - Unremarkable
- **Babygram:**
  - Double bubble, absence of distal bowel gas



# Case Discussion: Duodenal Atresia

- **Management**

- Pre-operative:
  - IV access and IV fluid administration
  - Gastric decompression
  - Rule-out commonly associated abnormalities
  - Echo: evaluate for cardiac anomalies
- Operative: Duodenoduodenostomy



# Interval Steps Before/Instead of Surgery

- **Peripheral IV access**
  - Maintenance IV fluids
- **Nasogastric/orogastric decompression**
- **Echocardiogram**
  - Rule-out associated cardiac defects (30% association)
- **Operative management is standard of care for duodenal atresia**



# Operation

- **Duodenoduodenostomy**

- If present, site of windsock origin is proximal to the level of obstruction
- Evaluate for concurrent malrotation and downstream atresias/stenosis
- Commonly performed open
- Laparoscopic repair appropriate



# Operation

## • Duodenoduodenostomy

–Not recommended:

- Duodenal tapering
- Duodenal resection and anastomosis.

–Diamond-shaped anastomosis

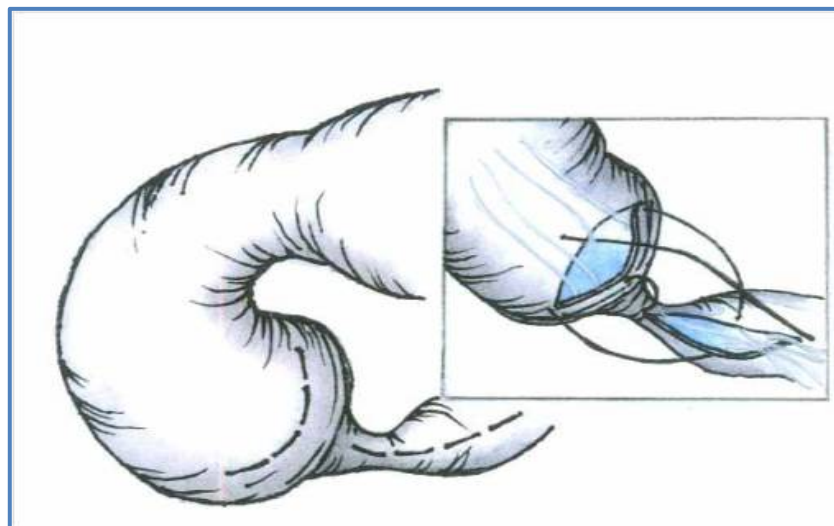


Image credit: APSA NaT

# Post-operative Management

- **Some obtain UGI study on POD 5**
  - Evaluate for leak prior to initiating feeds
- **Dilated proximal duodenum**
  - Prolong return of bowel function
- **Waiting for full normalization of gastric drainage**
  - May delay feed initiation



# Complications

- **Peri-operative**
  - Failure to identify correct anatomy
  - Failure to identify additional atresias/stenosis
  - Injury to ampulla of Vater
  - Increased time to goal feeds
- **Long term**
  - Delayed gastric emptying
  - Reflux
  - Adhesive obstruction
  - Peptic ulcer disease
  - Megaduodenum



# Questions

**Duodenal atresia is associated with which other anomaly?**

- a. Gastroschisis
- b. Congenital cardiac defect
- c. Epidermolysis bullosa
- d. Hirschsprung's disease



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**Duodenal atresia is associated with which other anomaly?**

- a. Gastroschisis
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- c. Epidermolysis bullosa
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# Questions

**A newborn has an episode of bilious emesis. The babygram may have distal bowel gas, but the findings are minimal. What is the next best study to make the definitive diagnosis?**

- a. Ultrasound
- b. CT scan
- c. Contrast enema
- d. Upper GI study



# Questions

**A newborn has an episode of bilious emesis. The babygram may have distal bowel gas, but the findings are minimal. What is the next best study to make the definitive diagnosis?**

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# Final Discussion/Review

- Duodenal atresia is due to failure of recanalization
- Pre-natal ultrasound with polyhydramnios and double bubble
- 50% of duodenal atresia patients will have associated congenital anomalies
- Surgical repair is duodenoduodenostomy
- Patient may get to goal feeds slowly after surgery, due to dysmotility



# References/Further Reading

- **Pediatric Surgery NaT**
  - <https://www.pedsurglibrary.com/apsa/>
- **Holcomb and Ashcraft's Pediatric Surgery**
  - Ogle SB, Nichol PF, and Ostlie DJ. Duodenal and Intestinal Atresia and Stenosis. In *Holcomb and Ashcraft's Pediatric Surgery, 7th edition*. (Holcomb GW III, Murphy JP, eds.) Philadelphia: Elsevier, 2020.
- **Pediatric Surgery**
  - Applebaum H and Sydorak R. Duodenal Atresia and Stenosis – Annular Pancreas. In *Pediatric Surgery, 7th edition*. (Coran AG, Adzick NS, Krummel TM, et al, eds.) Philadelphia: Elsevier, 2012.



# Acknowledgement Slide

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**The preceding educational materials were made available through the American Pediatric Surgical Association.**

**In order to improve our educational materials we welcome your comments/suggestions:**

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