AMSER Case of the Month January 2025

Neonatal Bilious Vomiting

Hannah Curtis – Loma Linda University School of Medicine

Dr. Jared Webster

Loma Linda University Health

LOMA LINDA UNIVERSITY School of Medicine

AMSER

Patient Presentation

- 1-day old male (35w5d GA) born via C-section with pregnancy complicated by pre-eclampsia, brought to Loma Linda University NICU from an outside hospital, presenting with bilious vomiting
- Labs demonstrated hyponatremia and anemia
- Vital signs significant for intermittent hypotension and hypoxia
- Physical exam significant for a firm, distended abdomen

What Imaging Should We Order?

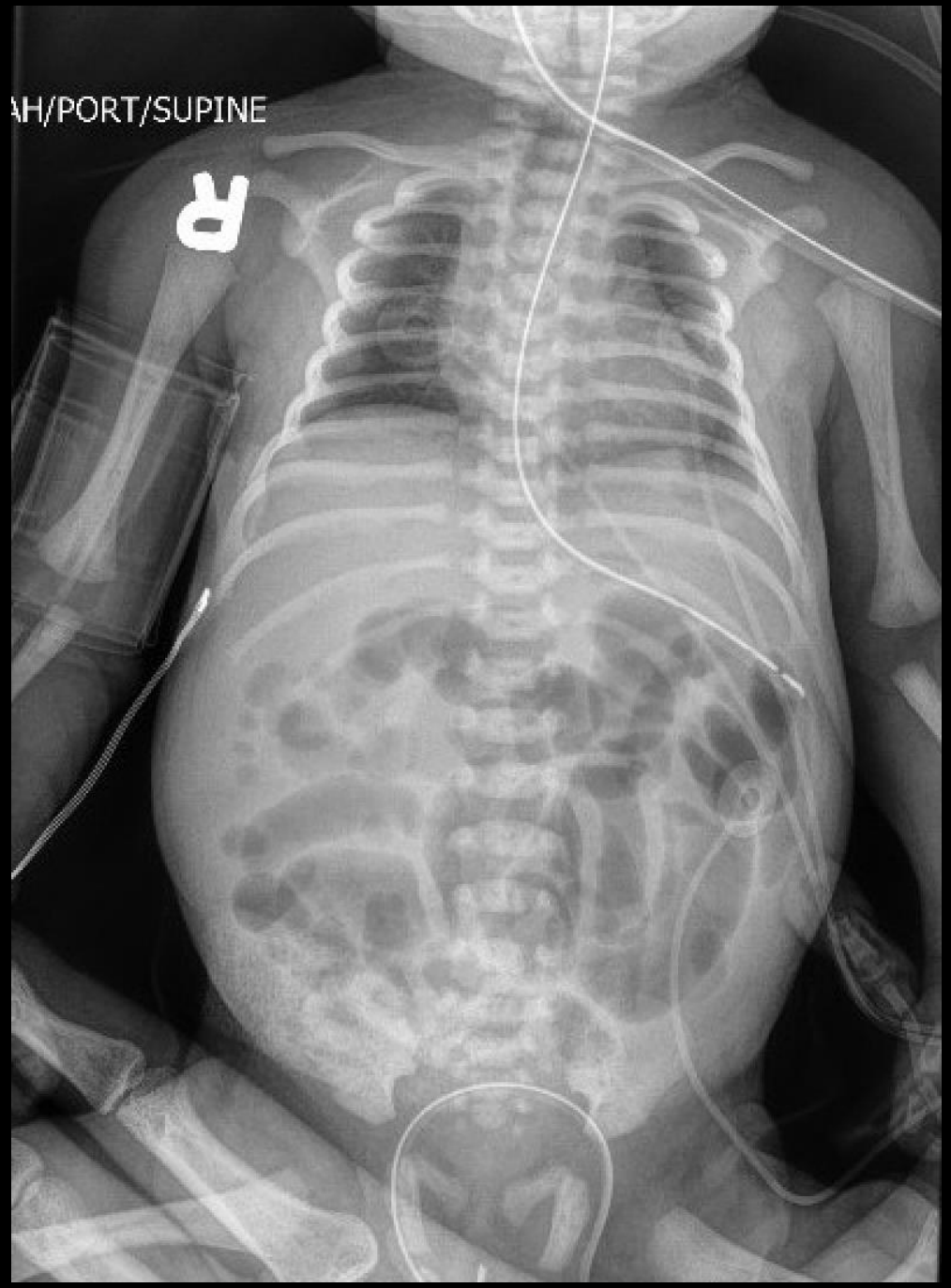
ACR Appropriateness Criteria

American College of Radiology
ACR Appropriateness Criteria®
Vomiting in Infants

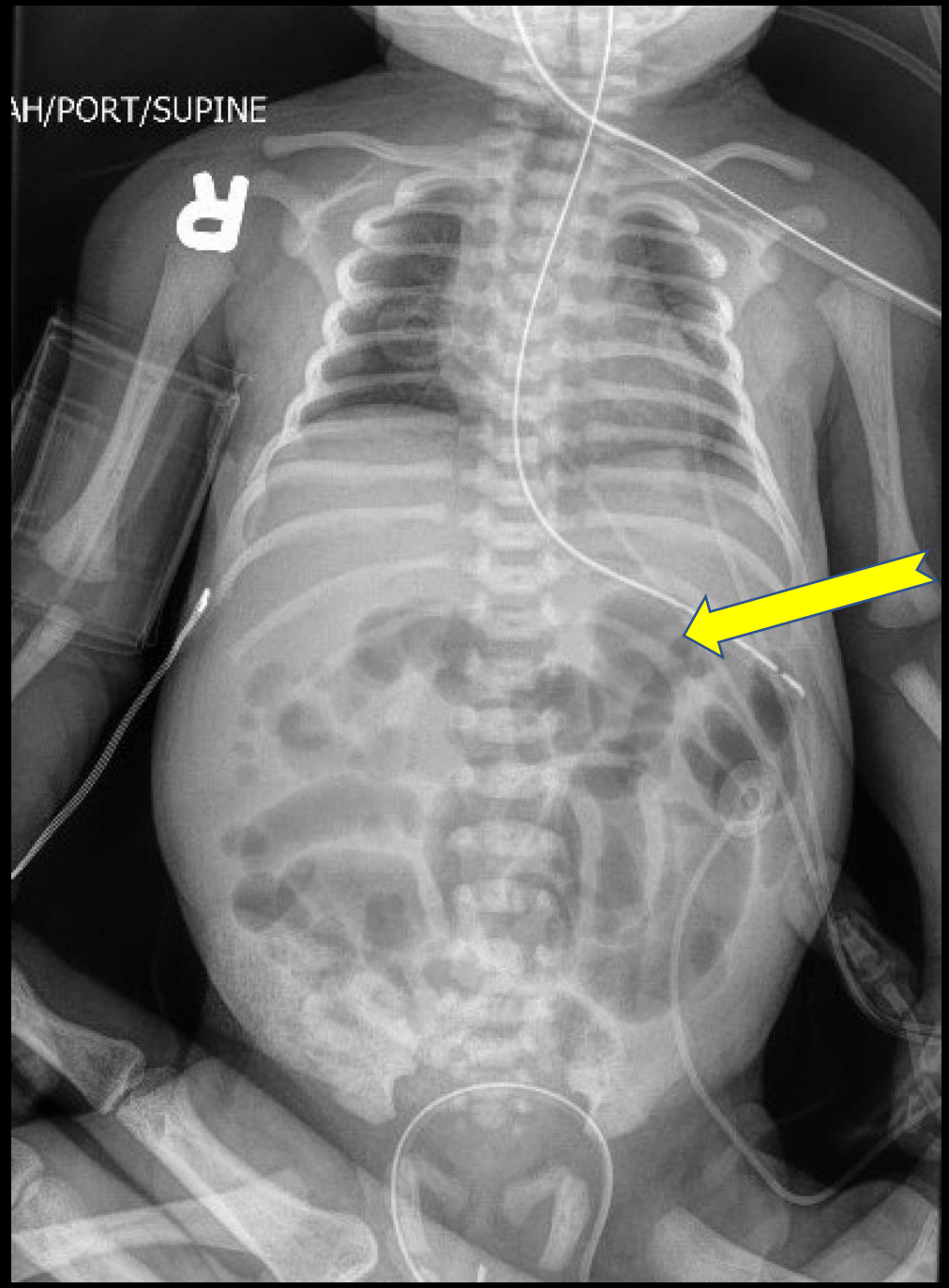
Variant 1: **Vomiting within the first 2 days after birth. Poor feeding or no passage of meconium. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography abdomen	Usually Appropriate	☢☢
US abdomen (UGI tract)	Usually Not Appropriate	O
Fluoroscopy contrast enema	Usually Not Appropriate	☢☢☢☢
Fluoroscopy upper GI series	Usually Not Appropriate	☢☢☢
Nuclear medicine gastroesophageal reflux scan	Usually Not Appropriate	☢☢☢

This imaging modality was ordered initially



Supine Radiograph



Findings:

-Prominent gas-distended, slightly featureless bowel loops throughout the abdomen

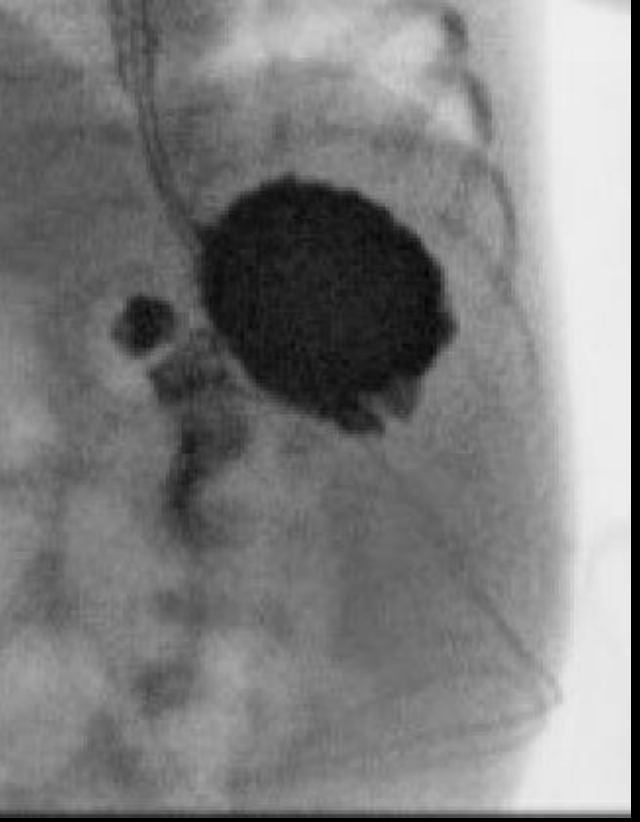
-Enteric tube and urinary catheter in place

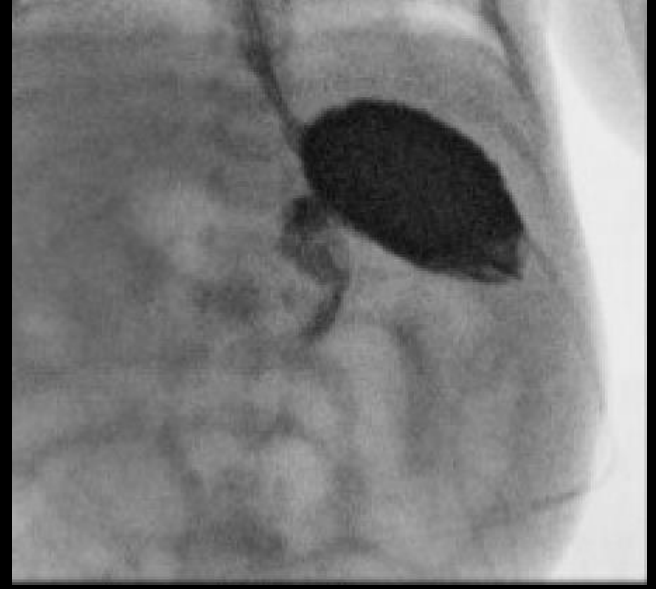
ACR Appropriateness Criteria

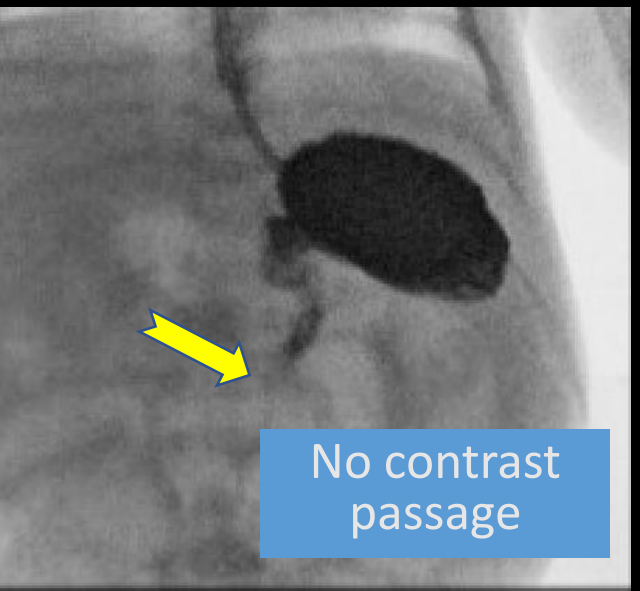
Next step in diagnosis

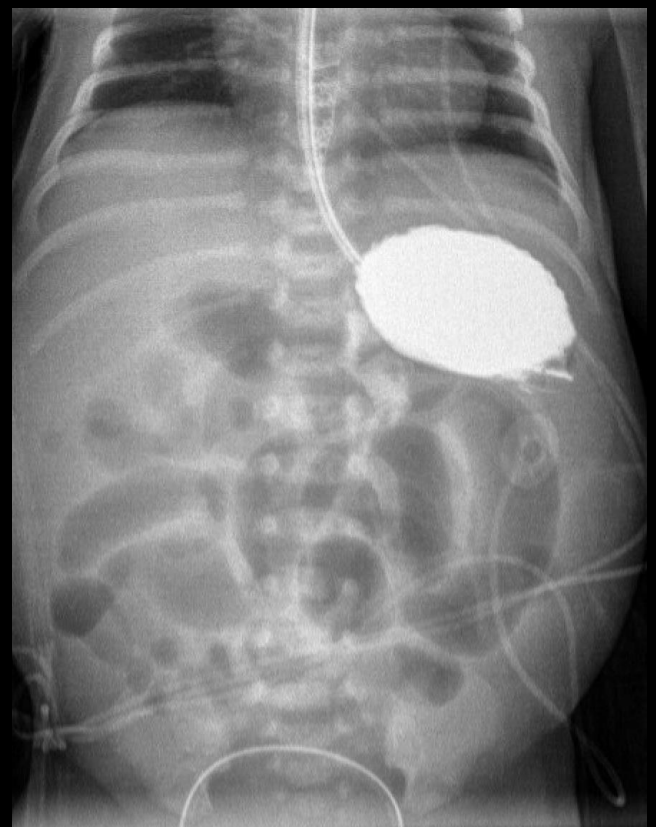
Variant 4: **Bilious vomiting within the first 2 days after birth. Radiographs show a nonclassic double bubble with gas in the distal small bowel, or few distended bowel loops, or a normal bowel gas pattern. Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
Fluoroscopy upper GI series	Usually Appropriate	☢☢☢
US abdomen (UGI tract)	May Be Appropriate	O
Fluoroscopy contrast enema	Usually Not Appropriate	☢☢☢☢
Nuclear medicine gastroesophageal reflux scan	Usually Not Appropriate	☢☢☢









Upper GI Study

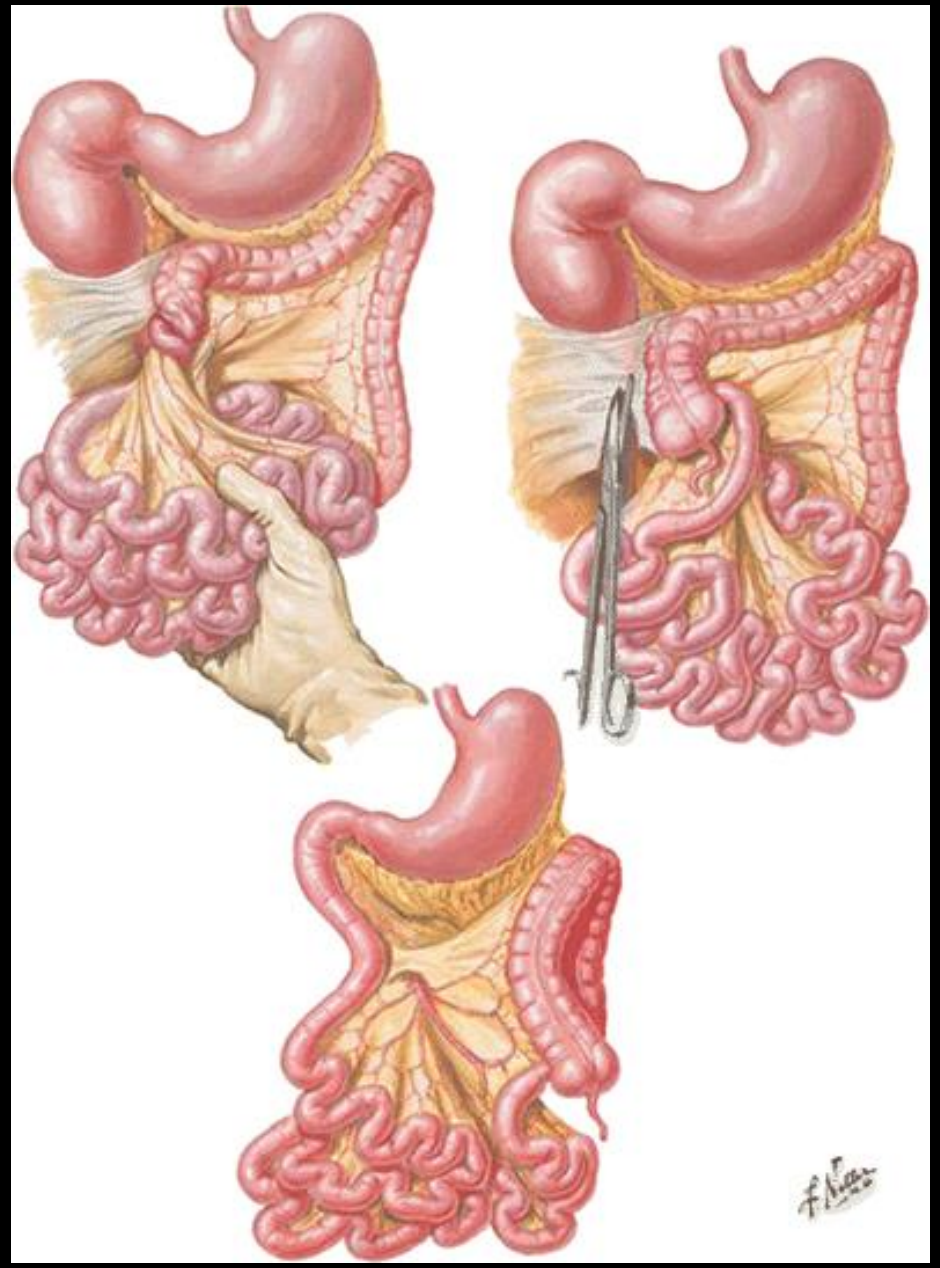
- Contrast was introduced into the enteric tube
- Evidence of intermittent gastroesophageal reflux
- Slow transit of contrast from the stomach to the duodenum
- No passage of contrast beyond this portion of the duodenum is seen during 25 min exam period
- Prominent gaseous distention of bowel loops

Final Dx:

Intestinal Malrotation with Midgut Volvulus

Treatment

- Surgical Emergency!
  - Malrotation with volvulus is treated surgically with emergent surgical intervention and a Ladd procedure.
- Patient was taken to the OR with pediatric surgery
  - Found to have 900 degree clockwise rotation, which was de-torsed
  - No perforation noted
  - Dark and dusky bowel, suggestive of ischemia
  - Patient brought back to OR for partial bowel resection



Malrotation with Midgut Volvulus

- Definition – developmental anomaly of embryonic bowel complicated by torsion leading to bowel obstruction with risk of ischemia
- Presenting symptoms – bilious emesis, upper abdominal distension, abdominal tenderness, hemodynamic deterioration
- Demographics – Most common during first 3 weeks of life. 75% present by age 5
- Risk factors – congenital anomalies (CHD, intestinal atresia, VACTERL, heterotaxy, omphalocele, etc.) BCL6 mutation

References:

- Alani M, Rentea RM. Midgut Malrotation. [Updated 2023 Jul 31]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK560888/
- American College of Radiology. ACR Appropriateness Criteria®. Available at https://acsearch.acr.org/list . Accessed Oct 2024.
- Coste AH, Anand S, Nada H, et al. Midgut Volvulus. [Updated 2022 Sep 12]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441962/
- Gaillard F, Fahrenhorst-Jones T, Atkinson H, et al. Midgut volvulus. Reference article, Radiopaedia.org (Accessed on 09 Oct 2024) https://doi.org/10.53347/rID-1675
- Gaillard F, Walizai T, Amer M, et al. Whirlpool sign (mesentery). Reference article, Radiopaedia.org (Accessed on 09 Oct 2024) https://doi.org/10.53347/rID-8491
- Lampl, B., Levin, T.L., Berdon, W.E. *et al.* Malrotation and midgut volvulus: a historical review and current controversies in diagnosis and management. *Pediatr Radiol* **39**, 359–366 (2009). https://doi.org/10.1007/s00247-009-1168-y
- Kimura K, Loening-Baucke V. Bilious vomiting in the newborn: rapid diagnosis of intestinal obs
Fam Physician. 2000 May 1;61(9):2791-8. PMID: 10821158.