

AMSER Case of the Month

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5-week-old male with poor weight gain and
bilious vomiting

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Patient Presentation

- **HPI:** 5-week-old male presented to outpatient GI clinic with poor weight gain and recurrent bilious emesis. Patient initially did well after birth, progressing to episodes of small “spit-ups” at day of life (DOL) 4. These gradually increased to large volume emesis intermittently 4-5 times per day. Emesis is not always immediately following feeds. Patient is exclusively breastfed, and despite adequate feeding has had poor weight gain. Bowel movements normal and non-painful. PCP trialed Pepcid for suspected gastroesophageal reflux without relief of symptoms.
- **PMHx:** mild unconjugated hyperbilirubinemia on DOL 1, presumed to be secondary to breastfeeding jaundice (poor latching), monitored in newborn nursery without phototherapy, resolved.
- **Prenatal Hx:** Normal prenatal screens. Born at 40w2d to a 23-year-old G1P1 via C-section due to prolonged maternal rupture of membranes. APGARS 8 and 9.
- **Physical Exam:** Alert and active in NAD. Abdomen is soft and non-tender. No palpable abdominal masses or organomegaly. No jaundice.
- **Pertinent Labs:** none

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 5: **Bilious vomiting in an infant older than 2 days (suspected malrotation). Initial imaging.**

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

This imaging modality was ordered by the GI physician

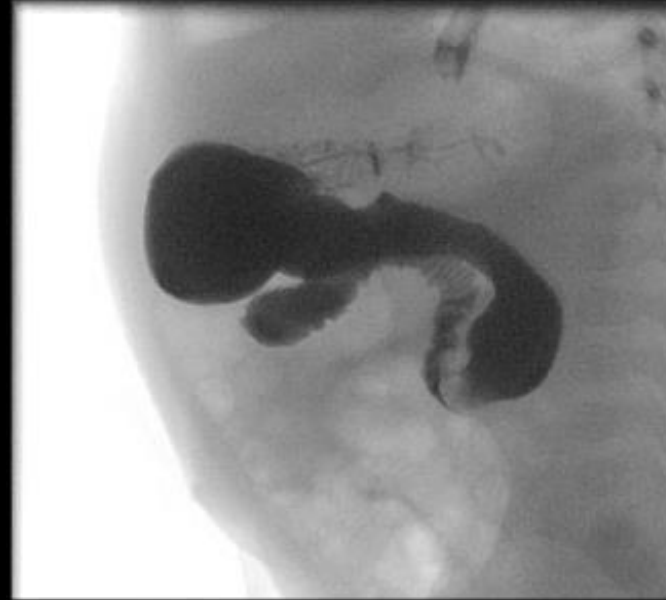


Findings (unlabeled)

Lateral view:



~7 minutes



Scout image

Frontal view:

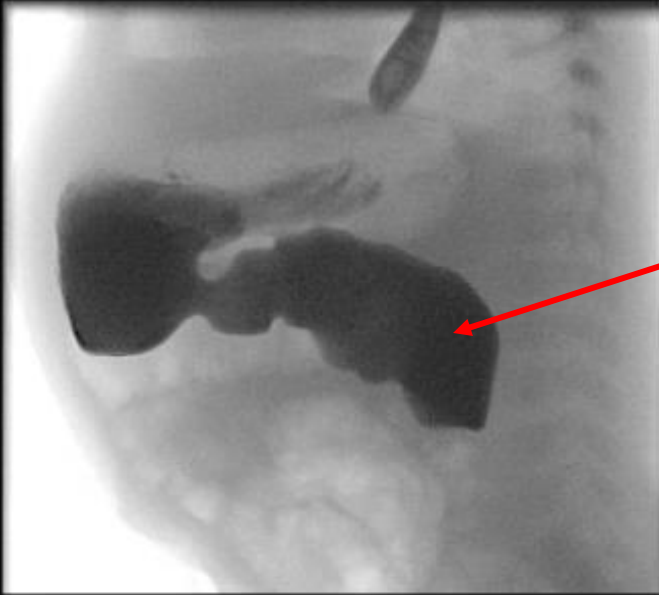


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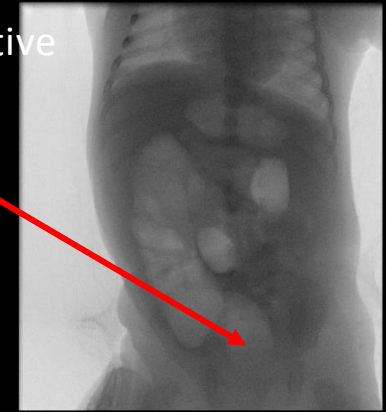
Findings (labeled)

Lateral view:

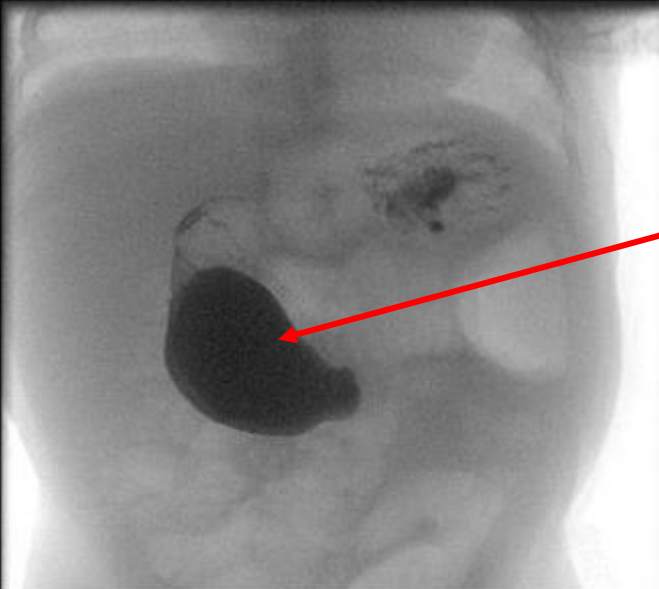


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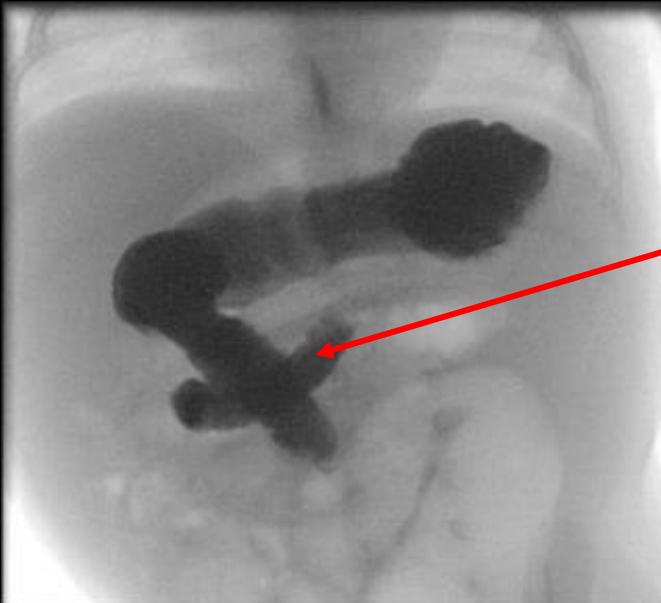
Air in distal colon/rectum suggests non-obstructive pattern.



Frontal view:



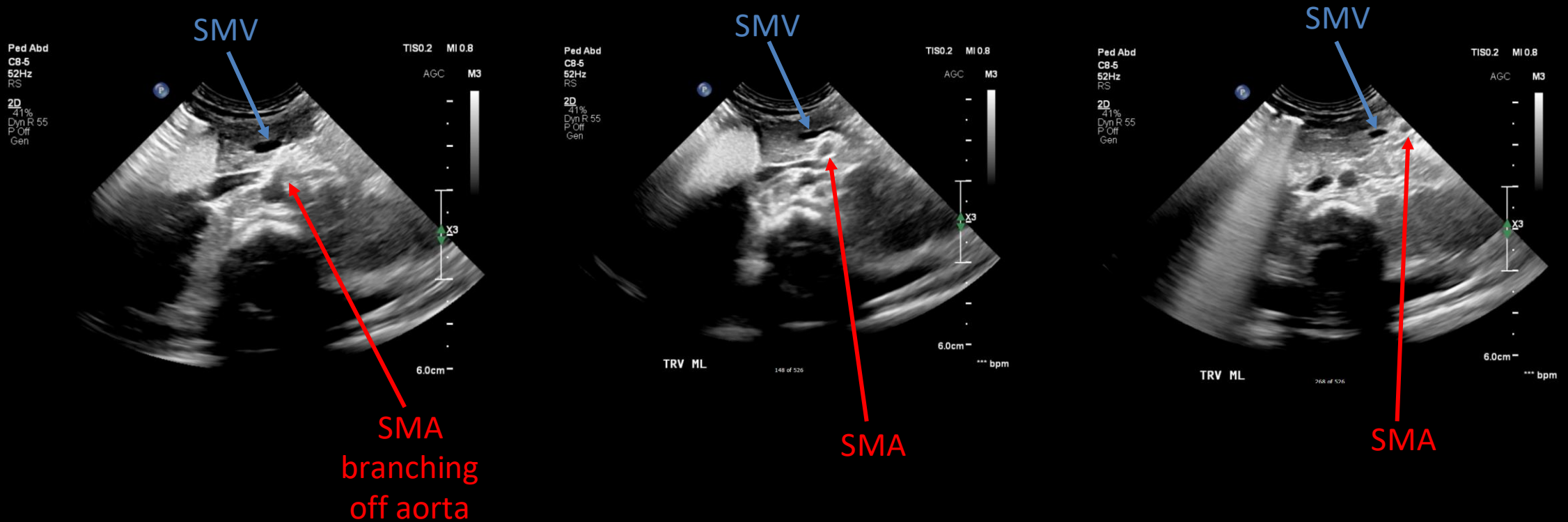
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Findings (unlabeled)



Findings (labeled)



Findings: Normal anatomic relationship of the superior mesenteric vein and superior mesenteric artery (SMA on left, SMV on right). **No volvulus is identified.**

Diagnosis

Differential:

- duodenal stenosis
- duodenal web with perforation
- annular pancreas

→ Exploratory laparotomy was performed.

- Findings:
 - Approximately 75% **duodenal stenosis** in D1/D2 near Ampulla of Vater

Case Discussion – Disease Overview

- Between the 8th and 10th weeks of embryonic development, the closed duodenum undergoes recanalization.
 - Complete failure of recanalization -> total occlusion of duodenal lumen = duodenal atresia
 - Partial failure of recanalization -> partial occlusion of duodenal lumen = duodenal stenosis
- The incidence of duodenal atresia is approximately 1 per 10,000 live births however less data exist on the incidence of duodenal stenosis.
- The second portion of the duodenum near the Ampulla of Vater is involved in approximately 70% of cases of duodenal atresia and stenosis.
- Approximately 30% of cases of duodenal atresia/stenosis are associated with Down syndrome.

Case Discussion – Disease Overview

- Duodenal atresia commonly results in polyhydramnios with the double-bubble sign visualized on prenatal US. If undetected prenatally, patient will present with vomiting (typically bilious) a few hours after birth. First line imaging is an abdominal radiograph which will show the double-bubble sign and gasless distal bowel.
- The presentation of duodenal stenosis is variable and dependent on the degree of stenosis. Severe stenosis can present similarly to duodenal atresia. Mild stenosis typically presents with vomiting after a few days of life. Abdominal radiograph of duodenal stenosis may show the double-bubble sign but is less specific and gas will be present distal to the obstruction.
- Treatment for both duodenal atresia and stenosis = immediate surgical correction with bypass of the obstruction. Post-treatment prognosis is excellent.

Case Discussion



Prenatal US showing classic double-bubble sign of duodenal atresia



Abdominal radiograph: double-bubble sign and paucity of distal bowel gas (duodenal atresia)



Abdominal radiograph: dilated stomach and proximal duodenum with distal bowel gas (duodenal stenosis)

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	○
Fluoroscopy contrast enema	Usually Not Appropriate	☼☼☼☼
Fluoroscopy upper GI series	Usually Not Appropriate	☼☼☼
Nuclear medicine gastroesophageal reflux scan	Usually Not Appropriate	☼☼☼

ACR Appropriateness Criteria for non-bilious vomiting within the first 2 days after birth recommend abdominal radiograph to assess for bowel obstruction rather than

Patient Outcomes

- Patient underwent exploratory laparotomy with duodenoduodenostomy and anastomosis without complication.
- Thereafter patient had a decrease in vomiting episodes and began to gain weight appropriately.

References:

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