

Pediatric Case

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Presentation

- Preterm infant born at 23w2d was admitted to NICU for failure to thrive

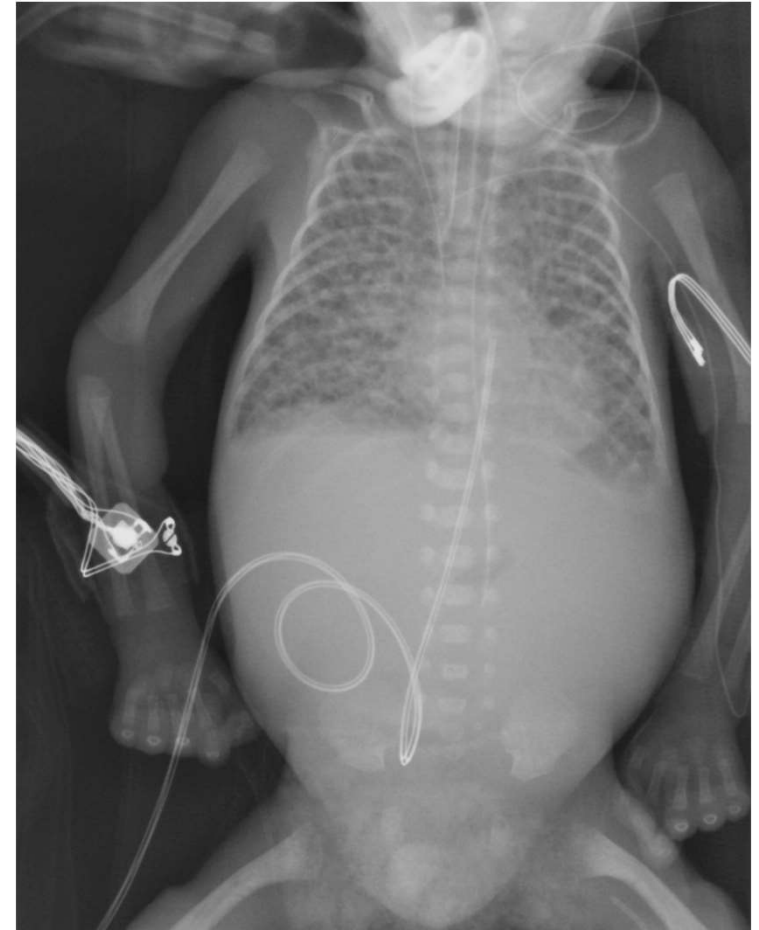
History: Day 7

- Exam revealed blue-tinged abdomen, edema to bilateral flanks, and an increased abdominal girth by 1cm




History: Day 7 continued

- Abdominal x-ray showed gasless abdomen
—> nonspecific but abnormal finding

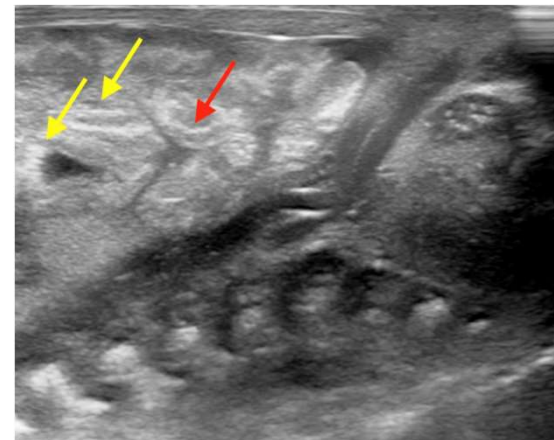
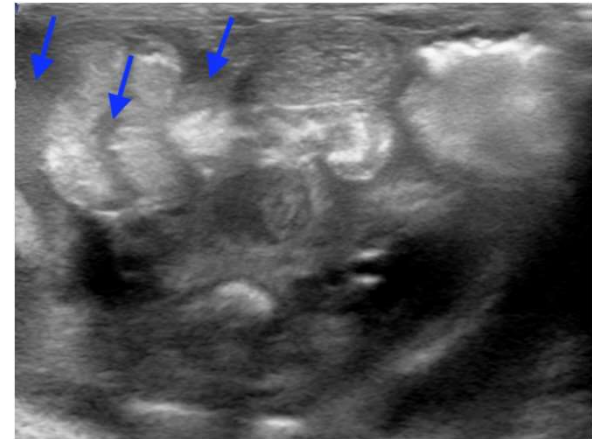


History: Day 16

- Exam revealed increased abdominal distention and dusky skin that extended into groin area.
 - Abdominal radiograph continued to show gasless abdomen.
 - Abdominal ultrasound was ordered to better assess bowel morphology
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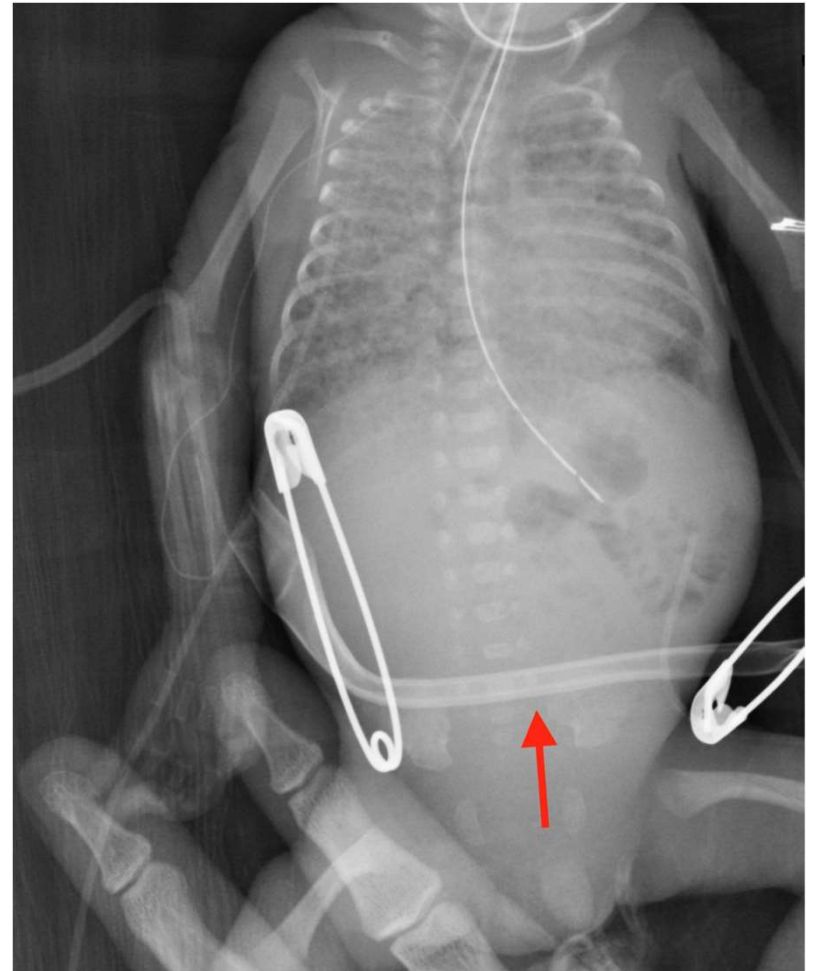
Radiographic features: Abdominal Ultrasound

- Abdominal US depicted diffuse bowel wall ischemia with wall thickening, portal venous gas, and complex free fluid
- Blue arrows point to regions of complex interloop fluid in the right lower quadrant (Transverse plane)
- Red arrow points to the echogenic submucosal layer of bowel. Yellow arrows show evidence of bowel wall thickening (Sagittal plane)



History continued


- Day 16: Peritoneal drain was placed bedside yielding meconium.
- Day 20: Supine abdominal radiograph was obtained. Red arrow points to penrose drain catheter lying across abdomen. Return of some intraluminal gas within normal caliber bowel loops are seen within left lower abdomen.



Diagnosis

- Necrotizing Enterocolitis
- Radiographic findings supporting diagnosis:
 - **Complex ascites, focal fluid collection**
 - **Bowel wall thickening**
 - Absent peristalsis
 - Free air

Discussion

- Necrotizing Enterocolitis (NEC) is a devastating gastrointestinal disease common in premature infants in the Neonatal Intensive Care Unit (NICU). It is characterized by damage to the intestinal tract, ranging from mucosal injury to full-thickness necrosis and perforation.
 - Timely diagnosis and treatment of NEC is essential because initial subtle symptoms can rapidly progress to intestinal perforation, peritonitis, and shock
 - Plain abdominal radiography is the current standard imaging modality for evaluation of NEC. It is useful in determining the presence, amount and distribution of gas
 - Limitations of radiography such as nonspecific findings early in disease course and lack of ability to portray disease progression can delay diagnosis and treatment of NEC.
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Discussion continued

- Advantages of abdominal US include the ability to characterize abdominal fluid and demonstrate bowel wall thickening, peristalsis, and intestinal perfusion.
- US features most strongly associated with surgery or death in infants with NEC include free air, absent peristalsis, complex ascites and focal fluid collection. Free air is the only aforementioned finding that can also be accurately diagnosed by plain radiography.
- Ultrasound also has the advantage of being portable, noninvasive, and free of ionizing radiation.
- Drawbacks of ultrasound use includes high user dependence, intolerance in labile or unstable infants, and poor imaging quality with large amounts of bowel gas present

Sources

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